IMPORTANT NOTICE

THIS OFFERING IS AVAILABLE ONLY TO INVESTORS WHO ARE EITHER (I) QIBS (AS DEFINED BELOW) OR (II) OUTSIDE THE UNITED STATES IN ACCORDANCE WITH REGULATION S (AS DEFINED BELOW).

You must read the following disclaimer before continuing: The following disclaimer applies to the attached offering circular. You are therefore advised to read this disclaimer carefully and in full before reading, accessing or making any other use of the attached offering circular. In accessing the attached offering circular, you agree to be bound by the following terms and conditions, including any modifications to them from time to time, each time you receive any information from us as a result of such access.

Confirmation of your representation: You have accessed the attached document on the basis that you have confirmed your representation to BNP Paribas, Citigroup Global Markets Inc., The Hongkong and Shanghai Banking Corporation Limited, The Korea Development Bank, Merrill Lynch International and Standard Chartered Bank (each an "Initial Purchaser") that (i) either (a) you are outside the United States and, to the extent you purchase the Notes, as defined and described in the attached offering circular, you will be doing so pursuant to Regulation S under the US Securities Act of 1933, as amended (the "Securities Act") or (b) you are acting on behalf of, or you are, a qualified institutional buyer ("QIB"), as defined in Rule 144A under the Securities Act, and (ii) you consent to delivery of the attached offering circular and any amendments or supplements thereto by electronic transmission.

The attached offering circular has been made available to you in electronic form. You are reminded that documents transmitted via this medium may be altered or changed during the process of transmission and consequently neither the Initial Purchasers nor any of their respective directors, officers, employees, representatives, agents or affiliates accepts any liability or responsibility whatsoever in respect of any discrepancies between the document distributed to you in electronic format and the hard copy version. We will provide a hard copy version to you upon request.

Prospective purchasers that are QIBs are hereby notified that the seller of the Notes described in the offering circular will be relying on the exemption from the provisions of Section 5 of the Securities Act pursuant to Rule 144A.

Restrictions: The attached offering circular is in preliminary form and is being furnished in connection with an offering exempt from registration under the Securities Act solely for the purpose of enabling a prospective investor to consider the purchase of the Notes described in the offering circular. You are reminded that the information in the attached offering circular is not complete and may be changed.

NOTHING IN THIS ELECTRONIC TRANSMISSION CONSTITUTES AN OFFER OF THE NOTES FOR SALE IN ANY JURISDICTION WHERE IT IS UNLAWFUL TO DO SO. THE NOTES HAVE NOT BEEN, AND WILL NOT BE, REGISTERED UNDER THE SECURITIES ACT, OR THE SECURITIES LAWS OF ANY STATE OF THE UNITED STATES OR OTHER JURISDICTIONS, AND THE NOTES MAY NOT BE OFFERED OR SOLD WITHIN THE UNITED STATES, EXCEPT PURSUANT TO AN EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT AND APPLICABLE STATE OR LOCAL SECURITIES LAWS.

Except with respect to eligible investors in jurisdictions where such offer is permitted by law, nothing in this electronic transmission constitutes an offer or an invitation by or on behalf of LG CHEM, LTD. or the Initial Purchasers to subscribe for or purchase any of the Notes described therein, and access has been limited so that it shall not constitute a general advertisement or general solicitation (as those terms are used in Regulation D under the Securities Act) or directed selling efforts (within the meaning of Regulation S under the Securities Act) in the United States or elsewhere.

The attached offering circular does not constitute, and may not be used in connection with, an offer or solicitation in any place where offers or solicitations are not permitted by law. If a jurisdiction requires that the offering of the Notes be made by a licensed broker or dealer and any Initial Purchaser or any affiliate of an Initial Purchaser, licensed brokers or dealers in that jurisdiction, the offering of any of the Notes shall be deemed to be made by such Initial Purchaser or such affiliate on behalf of LG CHEM, LTD. in such jurisdiction.

You are reminded that you have accessed the attached offering circular on the basis that you are a person into whose possession this offering circular may be lawfully delivered in accordance with the laws of the jurisdiction in which you are located and you may not nor are you authorized to deliver or forward this document, electronically or otherwise, to any other person. If you have gained access to this transmission contrary to the foregoing restrictions, you will be unable to purchase any of the Notes described therein.

Actions that you may not take: You should not reply by e-mail to this announcement, and you may not purchase any Notes by doing so. Any reply e-mail communication, including those you generate by using the "Reply" function on your e-mail software, will be ignored and/or rejected.

THE ATTACHED OFFERING CIRCULAR MAY NOT BE FORWARDED OR DISTRIBUTED TO ANY OTHER PERSON AND MAY NOT BE REPRODUCED IN ANY MANNER WHATSOEVER. ANY FORWARDING, DISTRIBUTION OR REPRODUCTION OF THIS DOCUMENT IN WHOLE OR IN PART IS UNAUTHORIZED. FAILURE TO COMPLY WITH THIS DIRECTIVE MAY RESULT IN A VIOLATION OF THE SECURITIES ACT OR THE APPLICABLE LAWS OF OTHER JURISDICTIONS. IF YOU HAVE GAINED ACCESS TO THIS TRANSMISSION CONTRARY TO ANY OF THE FOREGOING RESTRICTIONS, YOU ARE NOT AUTHORIZED AND WILL NOT BE ABLE TO PURCHASE ANY OF THE NOTES DESCRIBED IN THE ATTACHED OFFERING CIRCULAR.

You are responsible for protecting against viruses and other destructive items. Your use of this e-mail is at your own risk and it is your responsibility to take precautions to ensure that it is free from viruses and other items of a destructive nature.

The information in this preliminary offering circular is not complete and may be changed. This preliminary offering circular is not an offer to sell notes and it is not a solicitation of an offer to buy notes in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated June 30, 2022

Preliminary Offering Circular **Strictly Confidential**

LG CHEM, LTD.

(Incorporated with limited liability under the laws of the Republic of Korea.)

U.S.$ % Green Notes due 20

The U.S.$ % green notes due 20 (the "Notes") of LG CHEM, LTD. (the "Company," "we" or "us") will mature on , 20 . The Notes will bear interest at the rate of % per annum. Interest on the Notes will be payable in arrears on and of each year, commencing , 2023. We may, at our option, redeem all, but not some only, of the Notes at any time at their principal amount plus accrued interest in the event of certain changes in tax law as described under "Terms and Conditions of the Notes – Optional Redemption Due to Changes in Tax Treatment."

The Notes will constitute our direct, unconditional, unsubordinated and unsecured obligations and will at all times rank *pari passu* and without any preference or priority among themselves and with all of our other present and future direct, unconditional, unsubordinated and unsecured obligations, except as may be required by mandatory provisions of law.

The Notes are being issued as "Green Bonds" under our Green Financing Framework. See "Use of Proceeds."

The Notes are expected to be rated "A3" by Moody's Investor Services, Inc. ("Moody's") and "BBB+" by S&P Global Ratings, a division of S&P Global, Inc. ("S&P"). A rating is not a recommendation to buy, sell or hold securities and may be subject to revision, suspension or withdrawal at any time by the assigning rating organization.

Application has been made to the Singapore Exchange Securities Trading Limited (the "Singapore Stock Exchange") for the listing and quotation of the Notes on the Singapore Stock Exchange. The Singapore Stock Exchange assumes no responsibility for the correctness of any of the statements made, opinions expressed or reports contained in this offering circular. Approval in-principle from, admission to the Official List of, and the listing and quotation of the Notes on, the Singapore Stock Exchange are not to be taken as an indication of the merits of the Notes or the Company. There is currently no public market for the Notes.

The Notes will be issued in registered form in minimum denominations of U.S.$200,000 and integral multiples of U.S.$1,000 in excess thereof. The Notes will be represented on issuance by one or more global notes registered in the name of a nominee of The Depository Trust Company ("DTC"), as depositary. It is expected that delivery of the Notes will be made through the book-entry facilities of DTC on or about , 2022.

The Notes have not been and will not be registered under the U.S. Securities Act of 1933, as amended (the "Securities Act"), or the securities laws of any other jurisdiction, and may not be offered or sold within the United States except pursuant to an exemption from, or in a transaction not subject to, the registration requirements of the Securities Act. Accordingly, the Notes are being offered and sold only (i) to qualified institutional buyers in reliance on the exemption from the registration requirements of the Securities Act provided by Rule 144A thereunder ("Rule 144A") and (ii) outside the United States in compliance with Regulation S under the Securities Act ("Regulation S"). Prospective purchasers are hereby notified that the seller of the Notes may be relying on the exemption from the provisions of Section 5 of the Securities Act provided by Rule 144A. For a description of certain restrictions on resale or transfer, see "Transfer Restrictions."

See "Risk Factors" beginning on page 10 to read about certain risk factors you should consider before investing in the Notes.

Issue Price: %

Joint Bookrunners and Joint Lead Managers

BofA Merrill Lynch	BNP PARIBAS
Citigroup	HSBC
The Korea Development Bank	Standard Chartered Bank

The date of this offering circular is , 2022.

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You should rely only on the information contained in this offering circular. Neither we nor any of the Initial Purchasers (as defined in "Plan of Distribution") has authorized any person to provide you with information or make a representation that is inconsistent with or not contained in this offering circular and, if given or made, such information or representation must not be relied upon as having been authorized by us or any of the Initial Purchasers. This document may only be used where it is legal to offer and sell these Notes. The information in this document may only be accurate as of the date of this offering circular.

We, having made all reasonable inquiries, confirm that this offering circular contains all information with respect to us and the Notes which is material in the context of the issue and offering of the Notes, that the information contained in this offering circular is true and accurate in all material respects and is not misleading in any material respect, that the opinions and intentions expressed in this offering circular are honestly held and have been reached after considering all relevant circumstances and are based on reasonable assumptions, and that there are no other facts, the omission of which would, in the context of the issue and offering of the Notes, make this offering circular as a whole or any information or the expression of any opinions or intentions expressed in this offering circular misleading in any material respect. We accept responsibility accordingly.

No representation, warranty or undertaking, express or implied, is made and no responsibility or liability is accepted by any of the Initial Purchasers as to the accuracy or completeness of the information contained in this offering circular or any other information provided by us in connection with the offering of the Notes (the "Offering") or the Notes or their distribution or for any other statement made or purported to be made by any Initial Purchaser on its behalf in connection with us or the Offering. Each Initial Purchaser accordingly disclaims any and all responsibility or liability whether arising in tort or contract or otherwise which it might otherwise have in respect of the information contained in this offering circular, any other information provided by us in connection with the Offering or any other such statement.

This offering circular has been confidentially submitted to a limited number of investors for them to consider an investment in the Notes. See "Plan of Distribution." We have not authorized its use for any other purpose. This offering circular may not be copied or reproduced in whole or in part. This offering circular may not be distributed, nor may its contents be disclosed, except to the prospective investors to whom it is provided. By accepting delivery of this offering circular, each investor agrees to all of these restrictions. Notwithstanding anything to the contrary contained in this offering circular, we, the Initial Purchasers and each investor (and each of their respective employees, representatives, or other agents, as applicable) may disclose to any and all persons, without limitations of any kind, the tax treatment and tax structure of the transaction (including any materials, opinions or analyses relating to such tax treatment or tax structure), provided, however, that we, the Initial Purchasers and each investor (and each of their respective employees, representatives, or other agents, as applicable) will not disclose any information that is not necessary to understand the tax treatment and tax structure of the transaction (including the identity of our company, the Initial Purchasers or any investor and any information that could lead another to determine the identity of our company, the Initial Purchasers or any investor), or any other information to the extent that such disclosure could result in a violation of any U.S. federal or state securities law.

Neither this offering circular nor any other information supplied in connection with the Offering or any Notes (a) is intended to provide the basis of any credit or other evaluation or (b) should be considered as a recommendation by us or any of the Initial Purchasers that any recipient of this offering circular or any other information supplied in connection with the Offering or any Notes should purchase any Notes. Each investor contemplating purchasing any Notes should make its own independent investigation of our financial condition and affairs and its own appraisal of our creditworthiness and the terms of the Notes, including the merits and risks involved.

Neither the delivery of this offering circular nor any sale made in connection with this offering circular shall under any circumstances imply that the information in this offering circular is correct as of any date subsequent to the date of this offering circular or constitute a representation that there has been no change or development reasonably likely to involve a material adverse change in our affairs since the date of this offering circular.

This offering circular does not constitute an offer to sell or the solicitation of an offer to buy any Notes in any jurisdiction to any person to whom it is unlawful to make the offer or solicitation in such jurisdiction. The distribution of this offering circular and the offer or sale of the Notes may be restricted by law in certain jurisdictions. We and the Initial Purchasers do not represent that this offering circular may be lawfully distributed, or that any Notes may be lawfully offered, in compliance with any applicable registration or other requirements in any such jurisdiction, or pursuant to an exemption available thereunder, or assume any responsibility for facilitating any such distribution or offering. In particular, no action has been taken by us or the Initial Purchasers that would permit a public offering of any Notes or distribution of this document in any jurisdiction where action for that purpose is required. Accordingly, no Notes may be offered or sold, directly or indirectly, and neither this offering circular nor any advertisement or other offering material may be distributed or published in any jurisdiction, except under circumstances that will result in compliance with any applicable laws and regulations.

Persons into whose possession this offering circular or any Notes may come must inform themselves about, and observe, any such restrictions on the distribution of this offering circular and the offering and sale of the Notes. In particular, there are restrictions on the distribution of this offering circular and the offer or sale of Notes in the European Economic Area, the United States, the United Kingdom, Korea, Japan, Hong Kong, Singapore, Italy and Switzerland. See "Plan of Distribution" and "Transfer Restrictions."

The Notes have not been approved or disapproved by the U.S. Securities and Exchange Commission or any other securities commission or other regulatory authority in the United States, nor have the foregoing authorities approved this offering circular or confirmed the accuracy or determined the adequacy of the information contained in this offering circular. Any representation to the contrary is unlawful.

Notification under Section 309B(1)(c) of the Securities and Futures Act 2001 of Singapore (the "SFA") – the Company has determined, and hereby notifies all relevant persons (as defined in Section 309A(1) of the SFA), that the Notes are prescribed capital markets products (as defined in the Securities and Futures (Capital Markets Products) Regulations 2018 of Singapore) and Excluded Investment Products (as defined in MAS Notice SFA 04-N12: Notice on the Sale of Investment Products and MAS Notice FAA-N16: Notice on Recommendations on Investment Products).

Neither we nor any of the Initial Purchasers is making any representation to any purchaser of the Notes regarding the legality of an investment in the Notes by such purchaser under any legal investment or similar laws or regulations. You should not consider any information in this offering circular to be legal, business or tax advice. You should consult your own attorney, business adviser and tax adviser for legal, business and tax advice regarding an investment in the Notes.

We reserve the right to withdraw this offering of the Notes at any time. We and the Initial Purchasers also reserve the right to reject any offer to purchase the Notes in whole or in part for any reason and to allocate to any prospective investor less than the full amount of Notes sought by such investor.

IN CONNECTION WITH THE OFFERING, TO THE EXTENT PERMITTED BY, AND IN ACCORDANCE WITH, APPLICABLE LAWS AND REGULATIONS, EACH OF THE INITIAL PURCHASERS, WHO MAY ACT AS STABILIZATION MANAGERS (OR PERSONS ACTING ON BEHALF OF THE STABILIZATION MANAGERS), MAY OVER-ALLOT OR EFFECT TRANSACTIONS WITH A VIEW TO SUPPORTING THE MARKET PRICE OF THE NOTES AT A LEVEL HIGHER THAN THAT WHICH MIGHT OTHERWISE PREVAIL (A "STABILIZING ACTION"). HOWEVER, THERE IS NO ASSURANCE THAT THE STABILIZATION MANAGERS (OR PERSONS ACTING ON BEHALF OF THE STABILIZATION MANAGERS) WILL UNDERTAKE A STABILIZING ACTION. ANY STABILIZING ACTION MAY BEGIN ON OR AFTER THE DATE ON WHICH ADEQUATE PUBLIC DISCLOSURE OF THE TERMS OF THE OFFER OF THE NOTES IS MADE AND, IF BEGUN, MAY BE ENDED AT ANY TIME, BUT IT MUST END NO LATER THAN THE EARLIER OF 30 DAYS AFTER THE ISSUE DATE OF THE NOTES AND 60 DAYS AFTER THE DATE OF THE ALLOTMENT OF THE NOTES. ANY STABILIZING ACTION OR OVER-ALLOTMENT MUST BE CONDUCTED BY THE STABILIZATION MANAGERS (OR ANY PERSON ACTING ON BEHALF OF THE STABILIZATION MANAGER) IN ACCORDANCE WITH ALL APPLICABLE LAWS AND RULES.

THE NOTES HAVE NOT BEEN AND WILL NOT BE REGISTERED UNDER THE FINANCIAL INVESTMENT SERVICES AND CAPITAL MARKETS ACT OF KOREA. THE NOTES HAVE NOT BEEN AND WILL NOT BE OFFERED, SOLD OR DELIVERED, DIRECTLY OR INDIRECTLY, IN KOREA OR TO, OR FOR THE ACCOUNT OR BENEFIT OF, ANY RESIDENT OF KOREA (AS DEFINED IN THE FOREIGN EXCHANGE TRANSACTIONS LAW OF KOREA AND ITS ENFORCEMENT DECREE), OR TO ANY OTHER PERSON FOR REOFFERING, RESALE OR RE-DELIVERY, DIRECTLY OR INDIRECTLY, IN KOREA OR TO, OR FOR THE ACCOUNT OR BENEFIT OF, ANY RESIDENT OF KOREA, EXCEPT AS OTHERWISE PERMITTED BY APPLICABLE KOREAN LAWS AND REGULATIONS. IN ADDITION, UNTIL THE EXPIRATION OF ONE YEAR AFTER THE ISSUANCE OF THE NOTES, THE NOTES MAY NOT BE TRANSFERRED TO ANY RESIDENT OF KOREA OTHER THAN A "QUALIFIED INSTITUTIONAL BUYER" (A "KOREAN QIB", AS DEFINED IN THE REGULATION ON SECURITIES ISSUANCE, PUBLIC DISCLOSURE, ETC. OF KOREA) WHO IS REGISTERED WITH THE KOREA FINANCIAL INVESTMENT ASSOCIATION AS A KOREAN QIB, PROVIDED THAT THE AMOUNT OF THE NOTES ACQUIRED BY SUCH KOREAN QIBS IN THE PRIMARY MARKET IS LIMITED TO NO MORE THAN 20 PERCENT OF THE AGGREGATE ISSUE AMOUNT OF THE NOTES.

CERTAIN DEFINED TERMS AND CONVENTIONS

In this offering circular, unless otherwise specified or the context otherwise requires:

- "we," "us," "our," "ourselves," "our company" or "the Company" refers to LG CHEM, LTD. and (except for references to "the Company") its consolidated subsidiaries;
- "Government" refers to the government of the Republic of Korea;
- "Korea" refers to the Republic of Korea;
- "U.S." or the "United States" refers to the United States of America;
- "Euro," "EUR" or "€" refers to the currency of the participating member states of the European Union;
- "U.S. dollars," "U.S.$," "US$" or "$" refers to the lawful currency of the United States of America;
- "S$" refers to the lawful currency of Singapore; and
- "Won" or "₩" refers to the lawful currency of the Republic of Korea.

All exchange rate data between the Won and the U.S. dollar in this offering circular, unless otherwise specified, has been translated using the applicable market average exchange rate, announced by Seoul Money Brokerage Services, Ltd. in Seoul, rounded to the nearest tenth of one Won (the "Market Average Exchange Rate"). No representation is made that the Won or U.S. dollar amounts referred to herein could have been or could be converted into U.S. dollars or Won, as the case may be, at any particular rate or at all.

Any discrepancies in the tables included herein between totals and sums of the amounts listed are due to rounding.

The information on our website, http://www.lgchem.com, or any website directly or indirectly linked to such website does not form a part of this offering circular and should not be relied upon.

PRESENTATION OF FINANCIAL INFORMATION

Our audited consolidated financial statements as of and for the years ended December 31, 2021 and 2020 (the "2021/2020 Financial Statements") and our audited consolidated financial statements as of and for the years ended December 31, 2020 and 2019 (the "2020/2019 Financial Statements"), and our unaudited consolidated interim financial statements as of March 31, 2022 and for the three months ended March 31, 2022 and 2021 (the "Consolidated Interim Financial Statements"), included in this offering circular have been prepared in accordance with International Financial Reporting Standards as adopted by the Republic of Korea ("Korean IFRS") and, in the case of the interim financial statements, Korean IFRS 1034, "Interim Financial Reporting," which differ in certain significant respects from generally accepted accounting principles in other countries, including the United States, as well as International Financial Reporting Standards as issued by the International Accounting Standards Board. We have made no attempt to identify or quantify the impact of these differences.

Certain transactions that we have effected in recent years may affect the direct comparability of the historical financial information included in this offering circular as of and for different dates and periods. In March 2020, we substantially discontinued our glass substrate business, and in February 2021, we disposed of our LCD polarizer business. In July 2021, we disposed of all of our shares of Ugimag Korea Co., Ltd. ("Ugimag"). All such businesses were presented as discontinued operations in our consolidated financial statements as of and for the year ended December 31, 2021 and our consolidated interim financial statements as of and for the three months ended March 31, 2022, and the comparative consolidated financial statements for the year ended December 31, 2020 included in the 2021/2020 Financial Statements and the comparative consolidated interim financial statements for the three months ended March 31, 2021 included in the Consolidated Interim Financial Statements, were recast to retrospectively reflect such presentation. However, our consolidated financial statements as of and for the years ended December 31, 2020 and 2019 included in the 2020/2019 Financial Statements were recast to retrospectively reflect only the discontinuations of the glass substrate business and LCD polarizer business, and they were not recast to retrospectively reflect the disposal of our shares of Ugimag. Accordingly, our financial information as of and for the years ended December 31, 2021 and 2020 (in the case of 2020, included in the 2021/2020 Financial Statements) and for the three months ended March 31, 2022 and 2021 may not be directly comparable to our financial information as of and for the year ended December 31, 2019. See Note 34.2 of the notes to our 2021/2020 Financial Statements and Note 34.2 of the notes to our Consolidated Interim Financial Statements, included elsewhere in this offering circular.

ENFORCEABILITY OF CIVIL LIABILITIES

We are a corporation with limited liability organized under the laws of Korea. Most of our directors, executive officers and certain other persons named in this offering circular are non-U.S. residents, and all or a significant portion of the assets of our directors, executive officers and certain other persons named in this offering circular and most of our assets are located or registered outside the United States. As a result, when compared to a U.S. company, it may be more difficult for investors to effect service of process in the United States upon or to enforce against us, our directors or executive officers judgments obtained in United States courts predicated upon civil liability provisions of the federal or state securities laws of the U.S. or similar judgments obtained in other courts outside Korea. There is doubt as to the enforceability in Korean courts, in original actions or in actions for enforcement of judgments of U.S. courts, of civil liabilities predicated solely upon the federal and state securities laws of the United States.

GLOSSARY

Definitions of certain abbreviations used in this offering circular that relate to our business and the industries in which we operate are as follows.

ABS	Acrylonitrile Butadiene Styrene
BD	Butadiene
BPA	Bisphenol A
CCL	Copper Clad Laminate
CNT	Carbon Nanotube
DINP	Diisononyl Phthalate
EDC	Ethylene Dichloride
EP	Engineering Plastics
EPC	Engineering Plastic Compounds
ESS	Energy Storage System
EVA	Ethylene Vinyl Acetate
HPM	High Performance Materials
IPA	Isopropyl Alcohol
LCD	Liquid Crystal Display
LDPE	Low Density Polyethylene
MBS	Methacrylate Butadiene Styrene
NBL	Nitrile Butadiene Rubber Latex
NCC	Naphtha Cracking Centers
NPG	Neopentyl Glycol
OLED	Organic Light-Emitting Diode
PC	Polycarbonates
PE	Polyethylene
PET	Polyester
PO	Polyolefins
POE	Polyolefin Elastomer
PP	Polypropylene
PVC	Polyvinyl Chloride
RO	Reverse Osmosis
SAN	Styrene Acrylonitrile
SAP	Super Absorbent Polymers
SBS	Styrene Butadiene Styrene
SM	Styrene Monomer
TPEE	Ester Type Elastomer
VCM	Vinyl Chloride Monomer

SUMMARY

The following summary highlights information appearing elsewhere in this offering circular and does not contain all of the information you should consider in making your investment decision. You should read this summary together with the more detailed information, including our financial statements and the related notes, appearing elsewhere in this offering circular. You should carefully consider, among other things, the matters discussed in "Risk Factors."

Our Company

We are a leading global chemical company and the largest chemical company in Korea in terms of revenue. We manufacture and sell domestically and overseas a broad range of upstream and downstream petrochemical products, as well as rechargeable batteries and core materials used in the IT and automobile industries, among others. In addition, we are engaged in the manufacture and sale of pharmaceuticals, vaccines, diagnostic kits and fine chemicals. Specifically, our business comprises the following five segments:

- ***Petrochemicals.*** The petrochemicals segment, which is our largest business segment, manufactures and sells petrochemical products, including basic materials produced at our naphtha cracking centers ("NCCs") and synthetic resins and other products manufactured by processing such basic materials.

- ***LG Energy Solution.*** Our subsidiary LG Energy Solution Co., Ltd. ("LG Energy Solution"), which comprises our energy solutions segment, manufactures and sells rechargeable lithium ion batteries used in mobile devices and electric vehicles, as well as energy storage system ("ESS") batteries for renewable energy. LG Energy Solution was established in December 2020 through a split-off of our energy solutions segment.

- ***Advanced materials.*** The advanced materials segment manufactures and sells core materials for advanced products such as batteries, displays, semiconductors, automotive parts and water treatment filters.

- ***Life sciences.*** The life sciences segment manufactures and sells a variety of pharmaceuticals, vaccines, diagnostic kits and fine chemicals for primary and specialty care as well as aesthetics.

- ***Common and others.*** The common and others segment includes operations relating to crop protection products and fertilizers conducted through our wholly-owned subsidiary FarmHannong Co., Ltd. ("FarmHannong"), as well as supporting divisions, including general management, sales and research and development.

Our overall business objective is to maintain and enhance our position as a leading global chemical company with a diversified product portfolio that also encompasses energy solutions, advanced materials and life sciences products. Historically, our main products in terms of revenue have included a variety of synthetic resins such as acrylonitrile butadiene styrene ("ABS"), polyvinyl chloride ("PVC") and polyethylene ("PE"), although sales of our rechargeable batteries have been increasing significantly in recent years. We derive significant benefits from the diversification of our businesses and vertical integration of our petrochemical operations. For example, we produce basic materials for petrochemical products at our NCCs, such as ethylene and propylene, which are further processed into synthetic resins and other products, such as polyolefins ("PO"), PVC and plasticizers, ABS, engineering plastics ("EP"), acrylates and super absorbent polymers ("SAP") and rubber and specialty polymers. We believe that such vertical integration, which ensures a stable source of raw materials and demand for many of our products, as well as the diversified nature of our business mitigate the effects on our results of operations and financial condition of cyclical fluctuations, especially in the petrochemical industry.

We have established an extensive global network of production facilities located in key strategic locations. We currently operate 19 domestic production facilities located throughout Korea, and we operate production facilities outside Korea through 29 overseas manufacturing subsidiaries located across 18 countries, including China, Taiwan, India, Vietnam, the United States and Poland. In response to evolving market demand and in order to maintain the competitiveness of our products as well as diversify our product portfolio, we plan to continue to invest in expanding and upgrading our production capacity.

Our revenue (excluding discontinued operations) amounted to Won 27,353 billion in 2019, Won 30,059 billion in 2020, Won 42,655 billion in 2021, Won 9,645 billion for the three months ended March 31, 2021 and Won 11,608 billion for the three months ended March 31, 2022. We recorded profit (excluding discontinued operations) of Won 405 billion in 2019, Won 584 billion in 2020, Won 3,655 billion in 2021, Won 1,044 billion for the three months ended March 31, 2021 and Won 770 billion for the three months ended March 31, 2022. We had total assets of Won 64,417 billion and total equity of Won 35,491 billion as of March 31, 2022.

THE OFFERING

The following is a brief summary of certain terms of the Offering. For a more detailed description of the terms of the Notes, see "Terms and Conditions of the Notes." Capitalized terms used herein and not defined have the meanings given to them in such sections.

Issuer	LG CHEM, LTD.
Offering	U.S.$ aggregate principal amount of % green notes due 20 (the "Notes"). The Notes have not been registered with the U.S. Securities and Exchange Commission (the "SEC"), and are being offered and sold outside the United States in reliance on Regulation S and inside the United States to qualified institutional buyers as defined under the Rule 144A ("QIBs") in reliance on Rule 144A.
Joint Bookrunners and Joint Lead Managers	BNP Paribas Citigroup Global Markets Inc. The Hongkong and Shanghai Banking Corporation Limited The Korea Development Bank Merrill Lynch International Standard Chartered Bank
Fiscal Agent	Citicorp International Limited
Registrar, Paying Agent and Transfer Agent	Citibank, N.A., London Branch
Issue Date	, 2022.
Maturity Date	The Notes will mature on , 20 .
Status of the Notes	The Notes will constitute our direct, unconditional, unsubordinated and unsecured obligations and shall at all times rank *pari passu* and without any preference or priority among themselves and with all of our other present and future direct, unconditional, unsubordinated and unsecured obligations, except as may be required by mandatory provisions of law.
Interest	The Notes will bear interest at the rate of % per year.
Interest Payment Dates	Interest on the Notes will be paid semi-annually on and of each year, commencing on , 20 . For a further description of payments of interest on the Notes, see "Terms and Conditions of the Notes – Payments."

Taxation	Payments in respect of the Notes will be made free and clear of and without withholding or deduction for or on account of any present or future taxes, duties, assessments or governmental charges of whatever nature imposed or levied by or on behalf of Korea or by or within any political subdivision of Korea or any authority or agency of Korea having power to tax, unless the withholding or deduction of such taxes, duties, assessments or governmental charges is required by law. In that event, we will (subject to certain exceptions) pay such additional amounts as will result in the holders of the Notes (the "Holders") receiving such amounts as they would have received in respect of such Notes had no such withholding or deduction been required, except in certain limited circumstances. See "Terms and Conditions of the Notes – Additional Amounts" and "Taxation – Korean Taxation."
Tax Redemption	We may redeem the Notes at our option, in whole but not in part, at their principal amount plus accrued interest to, but excluding, the date fixed for redemption, if we have or would become obligated to pay additional amounts in respect of certain Korean taxes imposed in respect of payments of principal of or interest on the Notes. See "Terms and Conditions of the Notes – Optional Redemption Due to Changes in Tax Treatment."
Denominations	The Notes will be issued in denominations of U.S.$200,000 principal amount and integral multiples of U.S.$1,000 in excess thereof.
Form and Settlement	We will issue the Notes in the form of one or more fully registered global notes, registered in the name of a nominee of The Depository Trust Company ("DTC"). Except as described in "Terms and Conditions of the Notes," the global notes will not be exchangeable for Notes in definitive registered form and will not be issued in definitive registered form. Any secondary market trading of book-entry interests in the Notes will take place through DTC participants, including Euroclear Bank SA/NV ("Euroclear") and Clearstream Banking S.A. ("Clearstream"). See "Clearance and Settlement." The Notes may not be sold or otherwise transferred except in accordance with the restrictions described under "Transfer Restrictions."
Use of Proceeds	The net proceeds from the issuance of the Notes are expected to be U.S.$, after deducting a combined management and underwriting commission but not estimated expenses of the Offering. We will allocate an amount equivalent to the net proceeds from the issuance of the Notes to finance new Eligible Green Bond Projects (as defined in "Use of Proceeds") in accordance with our Green Financing Framework, which is in alignment with the Green Bond Principles 2021 published by the International Capital Markets Association and the Green Loan Principles 2021 published by the Loan Market Association. See "Use of Proceeds."

Ratings	The Notes are expected to be rated "A3" by Moody's and "BBB+" by S&P. A rating is not a recommendation to buy, sell or hold the Notes and may be subject to revision, suspension or withdrawal at any time by the assigning rating organization. Each such rating should be evaluated independently of any other rating of the Notes or of our other securities.
Governing Law	The Notes and the Fiscal Agency Agreements will be governed by, and construed in accordance with, the laws of the State of New York.
Listing and Trading	Application has been made to the Singapore Stock Exchange for the listing and quotation of the Notes on the Singapore Stock Exchange. For so long as the Notes are listed on the Singapore Stock Exchange and the rules of the Singapore Stock Exchange so require, the Notes, if traded on the Singapore Stock Exchange, will be traded in a minimum board lot size of S$200,000 (or its equivalent in foreign currencies). Accordingly, the Notes, if traded on the Singapore Stock Exchange, will be traded in a minimum board lot size of U.S.$200,000. For so long as the Notes are listed on the Singapore Stock Exchange and the rules of the Singapore Stock Exchange so require, in the event that a global note is exchanged for individual definitive notes, we will appoint and maintain a paying agent in Singapore, where the individual definitive notes may be presented or surrendered for payment or redemption. In addition, in the event that a global note is exchanged for individual definitive notes, an announcement of such exchange will be made by or on behalf of us through the Singapore Stock Exchange and such announcement will include all material information with respect to the delivery of the individual definitive notes, including details of the paying agent in Singapore.
Selling Restrictions	There are restrictions on the distribution of this offering circular and the making of solicitations pursuant hereto in certain jurisdictions, including, among others, the United States, the European Economic Area, the United Kingdom, Korea, Japan, Hong Kong, Singapore, Italy and Switzerland. See "Plan of Distribution" and "Transfer Restrictions."
LEI code	988400IES4EIG7O06940

Security Codes

	ISIN	CUSIP
Rule 144A: . . .	US501955AE89	501955 AE8
Regulation S: . .	USY52758AG77	Y52758 AG7

SUMMARY FINANCIAL DATA

The following tables set forth our summary financial data. Our summary financial data as of and for the years ended December 31, 2019, 2020 and 2021 set forth below has been derived from our audited consolidated financial statements included elsewhere in this offering circular. Our summary financial data as of March 31, 2022 and for the three months ended March 31, 2021 and 2022 set forth below has been derived from our unaudited consolidated interim financial statements included elsewhere in this offering circular. It is important that you read our summary financial data set forth below in conjunction with our consolidated financial statements and the related notes, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and other historical financial information appearing elsewhere in this offering circular. Our annual consolidated financial statements included in this offering circular have been prepared in accordance with Korean IFRS. Our unaudited consolidated interim financial statements included in this offering circular have also been prepared in accordance with Korean IFRS 1034 "*Interim Financial Reporting*." Our results of operations for the three months ended March 31, 2022 may not be indicative of our results of operations for the full year 2022.

Summary Consolidated Statements of Comprehensive Income Data

	For the Year Ended December 31,			For the Three Months Ended March 31,	
	2019[(1)]	2020	2021	2021	2022
	(in billions of Won, other than per share data)				
Revenue	₩ 27,353	₩ 30,059	₩ 42,655	₩ 9,645	₩11,608
Cost of sales	(22,667)	(23,741)	(31,436)	(7,187)	(9,110)
Gross profit	4,686	6,317	11,218	2,458	2,498
Selling and administrative expenses	(3,860)	(4,512)	(6,193)	(1,049)	(1,473)
Operating profit	825	1,805	5,025	1,409	1,024
Finance income	286	417	687	158	196
Finance costs	(421)	(1,109)	(661)	(195)	(239)
Share of net profit of associates and joint ventures accounted for using the equity method	22	9	(7)	2	(7)
Other non-operating income	519	1,155	903	316	287
Other non-operating expenses	(657)	(1,327)	(1,057)	(263)	(238)
Profit before income tax	574	952	4,891	1,428	1,024
Income tax expense	(169)	(368)	(1,236)	(384)	(254)
Profit from continuing operations	405	584	3,655	1,044	770
Profit (loss) from discontinued operations	(29)	99	299	327	(1)
Profit for the period	376	682	3,954	1,371	769
Other comprehensive income (loss) for the year, net of tax	72	(70)	847	207	205
Total comprehensive income for the period	449	612	4,801	1,578	975
Profit attributable to:					
Owners of the parent company	313	513	3,670	1,307	688
Profit from continuing operations	343	414	3,371	980	689
Profit (loss) from discontinued operations	(29)	99	299	327	(1)
Non-controlling interests	63	170	284	64	81
Total comprehensive income for the period attributable to:					
Owners of the parent company	383	452	4,414	1,493	853
Non-controlling interests	65	160	388	85	122

(1) In March 2020, we substantially discontinued our glass substrate business, and in February 2021, we disposed of our LCD polarizer business. In July 2021, we disposed of all of our shares of Ugimag. All such businesses were presented as discontinued operations in our consolidated financial statements as of and for the year ended December 31, 2021 and our unaudited consolidated interim financial statements as of and for the three months ended March 31, 2022, and the comparative consolidated financial statements for the year ended December 31, 2020 included in the 2021/2020 Financial Statements and the comparative consolidated interim financial statements for the three months ended March 31, 2021 included in the Consolidated Interim Financial Statements, were recast to retrospectively reflect such presentation. However, our consolidated financial statements as of and for the years ended December 31, 2020 and 2019 included in the 2020/2019 Financial Statements were recast to retrospectively reflect only the discontinuations of the glass substrate business and LCD polarizer business, and they were not recast to retrospectively reflect the disposal of our shares of Ugimag. Accordingly, our financial information as of and for the years ended December 31, 2021 and 2020 (in the case of 2020, included in the 2021/2020 Financial Statements) and for the three months ended March 31, 2022 and 2021 may not be directly comparable to our financial information as of and for the year ended December 31, 2019. See "Presentation of Financial Information," as well as Note 34.2 of the notes to our 2021/2020 Financial Statements and Note 34.2 of the notes to our Consolidated Interim Financial Statements, included elsewhere in this offering circular.

Summary Consolidated Statements of Financial Position Data

	As of December 31,			As of March 31,
	2019	2020	2021	2022
	(in billions of Won)			
Assets				
Current assets				
Cash and cash equivalents	₩ 1,889	₩ 3,274	₩ 3,761	₩ 9,052
Trade receivables	3,738	5,298	6,387	7,019
Other receivables	267	924	1,049	6,313
Other current financial assets	11	24	23	68
Prepaid income taxes	118	17	156	166
Other current assets	794	643	749	829
Inventories	5,034	5,350	8,283	9,312
Assets held for sale	20	789	5	5
Total current assets	11,870	16,320	20,414	32,765
Non-current assets				
Trade receivables	–	29	67	75
Other receivables	173	255	713	598
Other non-current financial assets	160	82	506	593
Investments in associates and joint ventures	308	309	535	531
Deferred tax assets	517	1,410	1,905	1,989
Property, plant and equipment	18,594	20,567	24,378	25,232
Intangible assets	2,206	2,280	2,444	2,492
Investment properties	53	49	56	57
Other non-current assets	144	87	116	87
Total non-current assets	22,155	25,069	30,721	31,653
Total assets	₩34,024	₩41,389	₩51,135	₩64,417
Liabilities				
Current liabilities				
Trade payables	2,380	3,459	3,742	4,691
Other payables	4,143	5,267	3,992	3,203
Borrowings	1,356	1,549	3,477	4,370
Other current financial liabilities	–	17	–	–
Provisions	472	1,041	1,573	1,430
Income tax payables	85	373	958	1,328
Other current liabilities	506	788	1,321	1,944
Liabilities held for sale	–	130	–	–
Total current liabilities	8,942	12,624	15,062	16,966
Non-current liabilities				
Other payables	11	12	16	16
Borrowings	7,058	8,637	11,289	10,324
Other non-current financial liabilities	1	42	0	–
Provisions	265	329	637	559
Net defined benefit liabilities	179	118	18	40
Deferred tax liabilities	52	690	714	846
Other non-current liabilities	133	147	190	175
Total non-current liabilities	7,699	9,974	12,863	11,961
Total liabilities	W16,641	₩22,598	₩27,925	₩28,926
Equity				
Share capital	391	391	391	391
Capital surplus	2,275	2,692	2,696	11,408
Other components of equity	(374)	(55)	(37)	(37)
Accumulated other comprehensive income	(85)	(165)	551	718
Retained earnings	14,799	15,175	18,092	17,842
Equity attributable to owners of the parent company	17,005	18,039	21,694	30,322
Non-controlling interests	379	751	1,516	5,169
Total equity	17,384	18,790	23,210	35,491
Total liabilities and equity	₩34,024	₩41,389	₩51,135	₩64,417

Other Financial Data

	For the Year Ended December 31,			For the Three Months Ended March 31,	
	2019	2020	2021	2021	2022
	(in billions of Won)				
Capital expenditures[(1)]	₩ 6,238	₩ 5,536	₩ 5,774	₩1,179	₩ 2,182
Depreciation and amortization	1,795	2,270	2,836	626	793
Net cash inflow from operating activities	3,121	5,841	5,510	1,066	156
Net cash outflow from investing activities	(6,111)	(5,296)	(5,349)	(38)	(7,264)
Net cash inflow from financing activities	2,301	938	124	688	12,337

(1) Capital expenditures represent cash used in the acquisition of property, plant and equipment.

You should carefully consider the risks described below and all other information contained in this offering circular before making an investment decision. If any of the following risks, as well as other risks and uncertainties that are not currently known or that we currently think are immaterial, are actually realized, our business, financial condition and results of operations could be materially and adversely affected. In that event, the trading price of the Notes could decline, and you may lose part or all of your investment.

Risks Relating to Our Business

We operate in highly competitive markets, and our failure to successfully compete would adversely affect our market position and business.

Because we operate several business segments in different industries with many product categories, we face a broad range of competition from existing and new competitors ranging from large multinational companies to highly specialized entities that focus on a limited number of business lines.

- Our petrochemicals segment faces competition mainly from global and local producers of petrochemical products (including other major Korean petrochemical companies), both in the domestic and overseas markets. The petrochemical industry is highly cyclical and demand for petrochemical products has fluctuated depending on general economic conditions in Korea and overseas. In particular, general economic conditions in China, one of the largest markets for petrochemical products globally, has had a significant impact on the business of the petrochemicals segment. An imbalance between supply and demand, as well as the emergence of low-cost producers in Asia and the Middle East, have resulted in pricing pressures as well as uncertainty regarding future prospects for the global petrochemical industry. While prices and margins in the Korean and global market for petrochemical products had improved in recent years due to stronger demand for such products, the petrochemical industry has suffered in the past from, and continues to face the prospects of, an oversupply of petrochemical products, and it is uncertain whether prices and margins in the domestic and global market for petrochemical products can be sustained. For instance, since 2020, demand in China has from time to time been adversely impacted by lockdowns in the country due to COVID-19, and higher oil prices, due to sanctions against Russia that have resulted from Russia's invasion of Ukraine among others, have been exerting upward pressure on our cost of sales. In addition, petrochemicals, which had traditionally been considered to be low value-added products, are now transforming into high value-added products as customers' demands are becoming increasingly specific and segmented. As a result, we will need to strengthen our research and development and market intelligence capabilities in order to stay competitive and retain market recognition.

- Our energy solutions segment primarily competes with major lithium ion battery manufacturers in Japan, China and Korea. The lithium ion battery industry is highly competitive, with a number of local and international producers competing in each of the major markets, some of which have larger market shares and greater brand recognition than us, in particular geographic and product segments. While significant technological improvements in lithium ion batteries used in mobile devices have been made over the past decade, the technology underlying automotive lithium ion batteries is still evolving, and extensive research and development will continue to be necessary to maintain competitiveness, with substantial capital investments required of existing as well as new producers.

- Our advanced materials segment faces competition from domestic and international producers of core materials for advanced products such as batteries, displays, semiconductors, automotive parts and water treatment filters, many of which are integrated with downstream manufacturers or upstream suppliers of key raw materials. Demand for such core materials tends to fluctuate based on demand for the relevant end-use goods such as electronics products and automobiles,

which, in turn, depends on general economic conditions in Korea and overseas, including in China. Due to the capital intensive nature of the industry and the high production volumes required to achieve economies of scale, the international market for such core materials is characterized by competition among a relatively small number of major domestic and international producers. We compete principally with producers based in Korea, China and Japan.

- Our life sciences segment's competitors include other global and domestic research-based pharmaceutical companies, as well as smaller companies with a more limited therapeutic focus and generic drug manufacturers. The pharmaceuticals sector in Korea and overseas is highly fragmented and intensely competitive. We mainly compete with other companies that manufacture and sell products that treat similar diseases or indications as our major products.

We face intense competition in most of the industries and markets in which we operate. Some of our competitors may have greater financial, sales and marketing, manufacturing, research and development or technological resources as well as broader and more diversified customer bases than us and may be able to manufacture products on a larger scale with greater cost efficiencies. They may also be able to devote greater resources to research and development and marketing of their products than us, as well as respond more quickly to evolving industry standards and changes in market conditions. Industry consolidation and strategic alliances among our competitors in the future may also result in increased competition. We cannot assure you that we will be able to effectively adapt to changing marketing conditions and continue to compete successfully with existing or new competitors, and our failure to do so may materially and adversely affect our business, financial condition and results of operations.

Fluctuations in the market price of naphtha, which, in turn, is affected by the market price and supply of crude oil, may adversely affect our margins and profits.

Naphtha, which is produced by refining crude oil, is the principal feedstock used in the production of petrochemical-based products sold by our petrochemicals segment, which accounts for a significant portion of our revenue and operating profit. As naphtha constitutes a significant component of our raw material requirements, our financial performance, including gross margins, is significantly impacted by the market price of naphtha, which, in turn, is affected by the market price and supply of crude oil.

The market price and supply of crude oil are subject to a variety of factors that are beyond our control, including the following:

- the continued negative impact of the global COVID-19 pandemic, as well as other unexpected events such as large-scale natural disasters and health epidemics affecting the global economy;

- hostilities, political or social tensions involving Russia, including the invasion of Ukraine by Russia and ensuing actions that the United States and other countries have taken or may take in the future and their impact on the prices of crude oil and other natural resources;

- political developments and instability in petroleum producing regions, in particular, the Middle East;

- activities of the Organization of Petroleum Exporting Countries and other petroleum producing nations in setting and maintaining production levels and, therefore, market prices;

- the development, market prices and supply levels of substitute energy sources, such as liquefied natural gas, coal, nuclear energy, solar energy and hydropower;

- the level of commitment and investment by governments and private sector enterprises in new, greenfield exploration projects and the success of such activities in increasing the global supply of crude oil for commercial applications;

- Korean as well as foreign government regulations with respect to the oil and energy industries in general;
- the growth in demand for energy resources in China and other large emerging economies;
- global weather conditions;
- exchange rate and interest rate fluctuations;
- expectations of inflation; and
- overall Korean and global economic conditions.

We have historically been able to pass on increases in naphtha and other raw material prices to our customers through price increases. Although the impact of fluctuations in raw material prices has in the past been partially mitigated by such product price adjustments, there can be no assurance that such adjustments will be sufficient to eliminate or reduce the adverse impact of such fluctuations in the future. In particular, because there is a time lag of generally one to two months before an increase in the market price of naphtha is reflected in the prices of our petrochemical products, there is no guarantee that we will continue to be able to pass along such increased costs to our customers without negatively impacting customer demand or our long-term relationships with customers. Future increases in prices of our raw materials, particularly naphtha, which is affected by fluctuations in crude oil prices, and our inability to pass along such increases to our customers on a timely basis may have a material adverse effect on our business, financial condition and results of operations.

Our dependence on limited sources of key raw materials may subject us to difficulties in meeting our raw material requirements in sufficient quantities and at prices favorable to us.

We purchase key raw materials, including naphtha, from limited sources. In 2021 and the three months ended March 31, 2022, approximately half of our naphtha requirements were supplied by GS Caltex, Hyundai Oilbank, Sonatrach, Reliance Industries and BP Singapore. To mitigate the risk of possible interruptions in the supply of such materials, such purchases are generally made through term agreements with renewal provisions that typically provide for the supply of a specified range of quantities, in the case of naphtha, at prices based on a predetermined formula linked to a measure of crude oil pricing.

In addition, we purchase a substantial amount of raw materials for the energy solutions segment and the advanced materials segment from overseas sources. Our purchases of such raw materials are generally made through purchase orders or agreements with the suppliers on both a regular and an on-demand basis at predetermined prices that may be adjusted by mutual agreement of the parties. See "Business – Raw Materials."

In the event we cannot renew our agreements with our raw material suppliers on acceptable terms or such raw material suppliers fail to deliver on their volume commitments, we will then need to seek alternative supply sources. From time to time, to the extent there are shortages from our suppliers to meet our raw material requirements, we purchase such materials on the spot market at prevailing market prices.

Although we strive to source our key raw material requirements from reliable and competitive suppliers in the domestic and overseas markets, the supply and market price of key raw materials remain subject to a variety of factors that are beyond our control, including natural disasters, severe health pandemics such as COVID-19 or geopolitical issues that result in trade restrictions such as the invasion of Ukraine by Russia and ensuing actions that the United States and other countries have taken. Any disruption in the supply of key raw materials or significant volatility in the market price of key raw materials could impair our ability to manufacture our products or could increase our production costs. While we have not experienced significant difficulties to date in obtaining key raw materials for our production requirements, there can be no assurance that we will be able to meet our future key raw material needs in sufficient quantities and at prices and terms acceptable to us. Our inability to obtain our key raw materials in sufficient quantities on a timely basis on commercially reasonable terms could have a material adverse effect on our business, financial condition and results of operations.

We engage in certain international activities and dealings, including certain operations in, and dealings relating to, Russia, and the procurement of necessary goods, materials, and other inputs, that may be subject to or otherwise affected by economic sanctions administered and enforced by various jurisdictions.

The U.S. government, including the U.S. Department of the Treasury's Office of Foreign Assets Control, or OFAC, administers and enforces certain laws and regulations, or U.S. primary sanctions, that impose prohibitions or restrictions on dealings with or related to certain designated countries and territories, governments, entities and individuals, and entities majority-owned by such parties, that take place within U.S. jurisdiction. U.S. primary sanctions include territorial sanctions targeting specific countries and jurisdictions; blocking sanctions, which generally prohibit U.S. persons from engaging in transactions or other dealings with or involving blocked persons or the property or interests in property of blocked persons; and non-blocking prohibitions and restrictions that target specific kinds of dealings, including, for example, dealings in debt or equity issued by certain designated parties after certain dates. U.S. primary sanctions are subject to frequent and unpredictable changes. For example, as a result of recent events in Ukraine, the United States has adopted new, additional and/or enhanced direct sanctions targeting Russia, and persons located in Russia. Although U.S. primary sanctions generally are not applicable to non-U.S. persons (although certain U.S. direct sanctions programs do apply to non-U.S. subsidiaries of U.S. companies), non-U.S. persons can be held liable for violations of U.S. direct sanctions to the extent they participate in prohibited transactions within U.S. jurisdiction (including transactions, for example, involving U.S. goods, services or technology, U.S. persons, or U.S. dollar payments that are cleared through the U.S. financial system). To the extent we engage in transactions within U.S. jurisdiction, U.S. primary sanctions may apply to us and our dealings, and changes to U.S. primary sanctions may affect what dealings we can pursue or engage in, and/or what counterparties we can interact with.

In addition to U.S. primary sanctions, the United States maintains numerous secondary sanctions programs that provide the U.S. government with authority to impose a variety of sanctions on non-U.S. persons that engage in certain sanctionable activities, including certain dealings with U.S. sanctioned persons, regardless of whether such activities occur within U.S. jurisdiction. The imposition of U.S. secondary sanctions is not automatic, and instead requires specific action by the U.S. government. In practice, U.S. secondary sanctions are highly discretionary and may be strongly influenced by political considerations, and accordingly, are difficult to predict. Non-U.S. parties that engage in sanctionable activities are potentially subject to a number of sanctions, including, among other things, the blocking of any property in the possession or control of U.S. persons in which the sanctioned party has an interest, and a prohibition on transactions or dealings with or involving such parties or property in which such persons have an interest if such transactions or other dealings are undertaken within U.S. jurisdiction. Our business and reputation could be adversely affected, for example, if the U.S. government were to determine that our activities, or the activities of any of our counterparties, involve sanctionable activity under U.S. secondary sanctions.

In addition to U.S. primary and secondary sanctions, other jurisdictions, including the European Union, the United Kingdom and Korea administer and enforce their own economic sanctions that target certain countries and territories, governments, entities and individuals in varying respects. Like the United States, some of these jurisdictions have adopted new, additional and/or enhanced sanctions targeting Russia in response to recent events. These sanctions may apply to us or our dealings, and changes to such sanctions may affect what dealings we can pursue or engage in, and/or what counterparties we can interact with.

Any violations of applicable sanctions by us could result in criminal, civil, and/or administrative liability for us, including potentially substantial fines and/or other criminal, civil, and/or administrative penalties, and our reputation being adversely affected.

We believe that our dealings have been conducted at all times in full compliance with applicable sanctions. In particular, we confirm that our transactions involving Russia have been conducted in full compliance with all sanctions laws. Although we intend to use our reasonable best efforts to maintain such compliance, we cannot guarantee that we will be in compliance in the future, particularly since the scope of such sanctions may be uncertain and such sanctions are subject to frequent and unpredictable changes.

We have a limited presence in Russia, have historically purchased, and continue to purchase pursuant to arrangements that were in place before the conflict in Ukraine began in February 2022, certain goods, materials, and other inputs from Russian counterparties, and have certain relationships pursuant to arrangements that were in place before February 2022 with Russian customers. We do not have any dealings with the government of the Russian Federation, the Central Bank of the Russian Federation, VTB Bank Public Joint Stock Company, The Corporation Bank for Development and Foreign Economic Affairs Vnesheconombank, Promsvyazbank Public Joint Stock Company, Bank Rossiya, or any person or arrangement that is owned or controlled by any of the aforementioned entities. We continue to evaluate our business activities in, with, or involving Russia in light of recent developments and will only engage in additional transactions in, with, or involving Russia that are fully compliant with applicable sanctions.

Additionally, changes to applicable sanctions may have negative impacts on our stable procurement of necessary goods, materials, and other inputs, and/or the prices of such goods, materials, and other inputs. Any impacts on the procurement or pricing of these items could have material and adverse effects on our business and results of operations.

The global COVID-19 pandemic and any possible occurrences of other types of widespread infectious diseases could materially and adversely affect our business, results of operations or financial condition.

COVID-19, an infectious disease caused by severe acute respiratory syndrome coronavirus 2, was declared a "pandemic" by the World Health Organization in March 2020. The global outbreak of COVID-19 has led to global economic and financial disruptions and has adversely affected our business operations, including through remote work arrangements we adopted in light of social distancing rules established by the Government. We have been subjected to and remain subject to a number of risks, including but not limited to:

- an increase in unemployment among, and/or decrease in disposable income of, consumers who purchase IT products, such as mobile devices, televisions and displays and a decline in overall consumer confidence and spending levels, which in turn may decrease demand for our products;

- disruption in the normal operations of the businesses of our customers, which in turn may decrease demand for our products;

- disruption in the supply of raw materials, components and equipment from our suppliers and vendors;

- disruption in the delivery of our products to our customers;

- disruption in the normal operations of our business resulting from contraction of COVID-19 by our employees, which may necessitate our employees to be quarantined and/or our production facilities or offices to be temporarily shut down;

- an increase in fluctuations of the Won against major foreign currencies; see "– Exchange rate fluctuations between the Won and major foreign currencies may adversely affect our financial results";

- unstable global and Korean financial markets, which may adversely affect our ability to meet our funding needs on a timely and cost-effective basis; and

- decreases in the fair value of our investments that may be adversely affected by the pandemic.

It is not possible to predict the duration or full magnitude of harm from COVID-19. In the event that COVID-19 or other types of widespread infectious diseases cannot be effectively and timely contained, our business, financial condition and results of operations may be materially and adversely affected.

Decreases in demand for our products in China may adversely affect our business and performance.

China is one of the largest markets for petrochemical-based products, rechargeable batteries and advanced materials globally and our largest overseas market in terms of revenue. Global prices and our sales volume of such products are in significant part influenced by China's actual and anticipated levels of consumption of such products, which are, in turn, dependent on the economic and market conditions and growth rates in China as well as in China's export markets. Any actual or anticipated decrease in Chinese consumption as a result of a slowdown in China's economic growth or otherwise, including as a result of regional lockdowns due to COVID-19, could lead to an imbalance in supply and demand, which would result in downward pressure on prices of our petrochemical-based products, rechargeable batteries or advanced materials, as well as on our sales volume of such products. China's GDP growth rate was 8.1% in 2021 as it partially recovered from the COVID-19 pandemic, compared to 2.3% in 2020 and 6.0% in 2019. A decline in the prices or sales volume of our petrochemical-based products, rechargeable batteries or advanced materials would cause our revenue and operating margins to decrease, which could have a material adverse effect on our business, financial condition and results of operations.

Our businesses are dependent on a number of industries, including the petrochemical, IT and automobile industries, and if any of these industries experiences a downturn, our revenue and margins could decrease.

We manufacture and sell a broad range of upstream and downstream petrochemicals, as well as rechargeable batteries and core materials used in the IT and automobile industries, among others. Accordingly, our business is affected by highly cyclical market demand for our intermediate products used as raw materials, additives or components by a number of industries, including the petrochemical, IT and automobile industries, which are sensitive to general conditions in the Korean and global economies. Macroeconomic factors, such as the economic growth rate, employment levels, interest rates, inflation rates, exchange rates, commodity prices, demographic trends and fiscal policies of governments can have a significant effect on such industries. From time to time, these industries have experienced significant and sometimes prolonged downturns, which, in turn, have negatively impacted our related businesses. During economic downturns, orders for our products may decrease, and we may need to adjust our production levels and product pricing.

In the past, unfavorable conditions and volatility in the worldwide financial markets, fluctuations in oil and commodity prices and lower levels of demand and economic activity have adversely affected the Korean and global economies. The overall prospects for the Korean and global economies in 2022 and beyond remain uncertain. We believe that demand for products manufactured by our life sciences segment is generally less sensitive to cyclical changes in economic conditions. However, an actual or anticipated deterioration of Korean or global economic conditions may result in a decline in demand for our other products used by the petrochemical, IT or automobile industry, which account for a substantial majority of our revenue and operating profit, which, in turn, could have a negative impact on the sales volume of such products as well as the prices at which such products can be sold. In such a case, we will likely face pressure to lower prices, and we may need to rationalize our production capacity and reduce our operating costs. Our ability to reduce expenditures for production facilities, labor and research and development during industry downturns is limited because of the need to maintain our competitive position. If we are unable to reduce our expenses sufficiently to offset reductions in price and sales, our margins will suffer and our business, financial condition and results of operations may be materially and adversely affected.

Our continued success depends on our customers' and our ability to develop products in a timely and cost-effective manner that addresses evolving user preferences and regulatory standards as well as advancements in technology, and their or our inability to do so could reduce demand for our products, resulting in lower revenue and profitability.

A significant majority of our sales consists of sales of our petrochemicals, energy solutions and advanced materials segment products to downstream manufacturers, which use such intermediate products as raw materials, additives or components in manufacturing end-use goods. Major customers for our products include LG Electronics, Kimberly-Clark and Bridgestone for our petrochemicals segment; GM, Hyundai Motor Company and Stellantis for our energy solutions segment; and LG Display, BOE Display, GM and Tesla for our advanced materials segment. See "Business – Our Business Segments and Products."

Our continued success depends significantly upon the success of our major customers' end-use products in the marketplace. We are subject to various risks beyond our control that influence the success or failure of a particular product offered by a customer, including:

- competition faced by the customer in its particular industry;
- market acceptance of and demand for the customer's product;
- the research and development, engineering, sales, marketing and management capabilities of the customer;
- technical challenges unrelated to our technology or products faced by the customer in developing its products;
- the financial and other resources of the customer; and
- changes in government regulations.

Our continued success will also depend to a significant extent upon our own ability to anticipate and respond to emerging industry standards and customer preferences by ensuring continued development of new, as well as enhancements to existing, products in a timely and cost-effective manner. The markets for our products, particularly our energy solutions and advanced materials segment products, are characterized by changing technology and evolving industry standards, often resulting in product obsolescence or short product lifecycles. For example, demand for liquid crystal display ("LCD") products has weakened in recent years in favor of new display technologies such as organic light-emitting diode ("OLED"), and while we have accordingly expanded our OLED films and encapsulates operations to maintain our competitiveness, there is no guarantee that we will be able to keep up with the rapid technological changes to continue to meet evolving industry standards and demand for our customers' end-use products. We expect to continue to invest in research and development to improve and diversify our product offerings and enhance our production facilities and manufacturing processes. However, there can be no assurance that we will succeed in focusing our research and development efforts on technologies that eventually become widely accepted, or on products that are timely released or commercially viable. Further advancements in technologies and their wider adoption as well as adoption of alternative technology solutions, and our inability to adequately anticipate and prepare for such changes, could result in a significant reduction in demand for our products.

We face various risks associated with our overseas operations, and, if we are not able to effectively manage these risks, our business and performance could be adversely affected.

Overseas sales represented 69.2%, 72.5%, 76.2%, 77.6% and 75.7% of our sales in 2019, 2020, 2021, and the three months ended March 31, 2021 and 2022, respectively, a significant portion of which was generated in China and other Asian countries, which accounted for 28.5% and 12.1%, respectively, of our total sales in 2021 and 31.1% and 12.6%, respectively, of our total sales in the three months ended March 31, 2022. We currently have 29 overseas manufacturing subsidiaries, 18 overseas marketing subsidiaries, 10 overseas representatives offices and three research and development subsidiaries in 18 countries throughout the world. The demand for and market acceptance of our products sold abroad are subject to a high level of uncertainty and are substantially dependent upon local market conditions. We also face additional risks associated with our overseas operations, including:

- fluctuations in exchange rates;
- increased costs associated with understanding overseas markets and monitoring regional and local economic, industry and customer trends, as well as developing and maintaining effective production, marketing and distribution presences in various countries;
- developing customer relationships and providing efficient customer service and support in markets abroad;
- difficulty and costs relating to compliance with commercial and legal requirements in overseas markets, including those relating to labor and the environment and industry-specific regulations;
- foreign exchange controls and fund repatriation restrictions;
- unanticipated changes in regional and local economic conditions;
- political instability and civil unrest, cultural and religious conflicts, and labor disputes; and
- trade barriers such as local content requirements, tariffs, taxes and other restrictions and expenses.

Our overall success as a global business depends, in part, on our ability to succeed in managing such risks. The likelihood of the risks being realized and their potential impact on our business vary from country to country and are difficult to predict with any degree of accuracy. We may not be able to develop and implement policies and strategies that will be effective in each location where we conduct business, and there can be no assurance that our exposure to such risks, which may become greater as we expand our overseas operations, will not adversely affect our business, financial condition, results of operations and future prospects.

Our business requires a significant amount of capital expenditures for the expansion, upgrading and maintenance of production capacity, and there is no guarantee that we will be able to successfully implement or fund our capital expenditure plans.

We operate in industries, such as the petrochemical, rechargeable battery and advanced materials industries, where producers with economies of scale enjoy a competitive advantage. Accordingly, our business requires a significant amount of capital investment for the expansion, upgrading and maintenance of production facilities and equipment as well as storage and transportation infrastructure on a timely and cost-effective basis in order to maintain long-term competitiveness and improve profitability. Our total capital expenditures (consisting of cash used in the acquisition of property, plant and equipment) amounted to Won 6,238 billion in 2019, Won 5,536 billion in 2020, Won 5,774 billion in 2021, Won 1,179 billion for the three months ended March 31, 2021 and Won 2,182 billion for the three months ended March 31, 2022 and mainly included expenditures for the expansion of automotive battery production facilities in Poland and Nanjing, China and the expansion of the NCC facilities in our Yeosu Complex.

We plan to continue to invest in enhancing our production facilities and upgrading our equipment and manufacturing processes in order to increase our production capacity, achieve additional economies of scale and support production of new products. We plan to spend approximately Won 9 trillion in 2022 (including amounts already expended in the three months ended March 31, 2022), principally for the construction of separator production facilities in Hungary, the construction of POE and PBAT facilities in Daesan, the expansion of NBL facilities in Malaysia and the expansion of cathode materials production facilities in Gumi. See "Business – Production Facilities."

Our ability to build, operate and maintain additional production capacity and increase or diversify our output is subject to significant risks and uncertainties, including delays and cost overruns associated with the build-out of new or upgraded facilities, delays in obtaining necessary government approvals, problems with supplies of raw materials and labor, and equipment malfunctions and breakdowns, which may be exacerbated by the COVID-19 pandemic. In addition, new or upgraded equipment may not perform at expected utilization levels, the yield and product quality of new equipment may differ from design specifications, and modifications may be necessary to correct equipment failing to perform as expected.

In order to finance our production facility expansion, maintenance and upgrading plans, we intend to use cash on hand, funds from operations and debt financing. However, we cannot guarantee that such sources will provide us with sufficient amounts of capital in a timely manner or that necessary funds can be obtained on terms acceptable to us and within the limitations imposed by the terms of our existing or any future financings. If we cannot meet our funding needs for capital expenditures, we may have to delay implementation of our production capacity expansion and upgrading plans. If we are unable to carry out our planned capacity expansions and upgrades, we may not be able to meet future customer demand, which could result in lower profitability and a loss in our market share. In addition, our capital investments typically will be made well in advance of any revenue that will be generated from making such expenditures. If unforeseen adverse market conditions lead to a decline in demand for our products, which. in turn, results in a mismatch between sales volume and production capacity, or if product prices decline due to market oversupply or we encounter production difficulties, we may not be able to recover our capital investments, in part or in full, or the recovery of these investments may take longer than expected, which may have a material adverse effect on our business, financial condition and results of operations.

We may be subject to declining average selling prices for some of our products, which may harm our revenue and profitability.

IT products, such as mobile devices, televisions, displays and semiconductors, and electric vehicles are subject to declines in average selling prices due to rapidly evolving technologies, industry standards and customer expectations and competition. As a result, manufacturers of such products may require us, as a supplier, to reduce our costs and lower the price of our intermediate products, such as rechargeable batteries and advanced materials, in order to mitigate the negative impact on their own margins. For example, we have reduced the prices of some of our rechargeable batteries for mobile devices in the past in order to meet market demand and expect to continue to face market-driven downward pricing pressure in the future for certain of our products. Our revenue and profitability may suffer if we are unable to offset any declines in our average selling prices by developing new or enhanced products or manufacturing processes with higher profit margins, increasing our sales volumes or reducing our costs on a timely basis.

Our strategic acquisitions or investments in joint ventures may not be successful, and we may not realize the anticipated strategic benefits and financial returns from such transactions.

We engage from time to time in acquisitions, joint ventures and other strategic investments in order to expand our production capacity, diversify our product portfolio, gain access to new markets and stable sources of raw materials or acquire new technologies. In the past, as part of our business strategy to diversify our product offerings, we merged with a former affiliate, LG Life Sciences, Ltd., in January 2017, which added the life sciences segment to our business, and acquired FarmHannong in April 2016, which added operations relating to crop protection products, fertilizers and seeds to our business. In June and July 2018, we formed two joint ventures with Huayou Cobalt Co., Leyou New Energy Materials (Wuxi) Co., Ltd. ("Wuxi JV") and Huajin New Energy Materials (Quzhou) Co., Ltd. ("Quzhou JV"),

respectively, to manufacture materials for rechargeable lithium ion batteries in China, which commenced production in October 2020 and June 2020, respectively. We believe that such joint venture partnerships with Huayou Cobalt Co. allow us to secure a stable local supply of cobalt, a key raw material required for the production of lithium ion batteries. More recently, in November 2021, we acquired the chemical electronics materials business from LG Electronics Inc. to enhance our separator business, and in February 2022, we acquired LG Energy Solution Vertech Inc., an electricity storage batteries installation service provider in the United States, as part of our efforts to strengthen our relationship with customers of electricity storage batteries and ultimately increase our sales. However, there is no guarantee that such acquisitions and joint ventures, as well as any other acquisitions and investments that we may undertake in the future, will be successful or that we will realize the anticipated strategic benefits and financial returns from such transactions.

We face various risks associated with our acquisitions and investments, including the following:

- we may face challenges as we seek to integrate the acquired company's or investee's operations into our business, and the realization of anticipated synergies may be delayed or substantially reduced;

- events beyond our control, including changes in regulations, technology and economic conditions, could adversely affect our ability to realize the anticipated benefits and returns from the acquisition or investment;

- the amount of our indebtedness may increase substantially and may constrain our operations;

- we may become exposed to unknown or contingent liabilities that could require us to spend significant amounts of additional capital to address;

- we may fail to retain, motivate and integrate key management, technical staff and other employees of the acquired company or investee;

- we may experience problems in retaining or attracting customers and integrating customer bases;

- the transaction may divert management's attention from our existing operations; and

- unanticipated write-offs or charges or impairment of goodwill may occur.

Any of the foregoing could have a material adverse effect on our business, financial condition and results of operations. In addition, joint venture investments may present additional financial, managerial and operational challenges, including our inability to require that the joint ventures pay dividends, sell assets, return invested capital or take other actions without the consent of our joint venture partners. Our joint venture partners may have economic or business interests that are inconsistent with ours, take actions contrary to our policies or objectives, undergo a change of control, experience financial and other difficulties or be unable or unwilling to fulfill their obligations under the joint ventures. Furthermore, since the success of joint venture transactions are often dependent on the financial condition and performance of partner companies, weak performance of or other problems with such partners may adversely affect the results of such transactions. Our business, financial condition and results of operations may be materially and adversely affected if disagreements or problems develop with our joint venture partners and we are unable to successfully resolve such disagreements or problems.

Safety risks relating to rechargeable lithium ion batteries and negative publicity associated therewith may negatively impact our business.

LG Energy Solution, our subsidiary which was established in December 2020 through a split-off of our energy solutions segment and with which we share joint and several liability with respect to liabilities that existed prior to the split-off, manufactures and sells rechargeable lithium ion batteries used in mobile devices, electric vehicles and ESS products. See "– LG Energy Solution and we remain jointly and severally liable for each other's liabilities that were incurred prior to the split-off of LG Energy Solution." Due to the high energy inherent in such batteries, rechargeable lithium ion batteries may pose certain safety risks, including the risk of fire. We incorporate procedures in our research and development, product design, manufacturing processes and transportation of such products that are intended to minimize safety risks, but accidents may occur and/or our products may require repair or replacement due to safety concerns. Although we currently carry insurance policies which will cover all or a portion of our losses arising from property damage, loss of inventory, business interruption and liability claims, any accident, whether at our production facilities or from the use of the products by customers, may result in production delays or claims for damages resulting from injuries or death that exceed our insurance coverages which, if significant, could have material adverse effects on our business, financial condition and results of operations.

For example, in October 2020 and February 2021, Hyundai Motor Company conducted global recalls of certain electric vehicles for which LG Energy Solution manufactures the battery system after a number of fires relating to such vehicles were reported. We have agreed with Hyundai Motor Company to divide the costs relating to the replacement of such battery systems, and have set aside provisions for such costs.

In November 2020, GM voluntarily recalled certain models of its electric vehicles for which LG Energy Solution manufactures the battery system after the National Highway Traffic Safety Administration of the United States began conducting an investigation into such models after a number of fires relating to such vehicles were reported. However, as additional fire incidents were reported after such recall, it conducted additional recalls from July 2021 to August 2021. In July 2021, a number of putative class action lawsuits were filed in the United States against GM for failing to disclose and adequately repair such alleged defects of the batteries, and in September 2021, the plaintiffs of such putative class actions filed amended complaints to include us as defendants, among others, for manufacturing the allegedly defective batteries. While we intend to vigorously defend against such claims, we cannot predict the outcome or impact of such lawsuit to us at this stage.

In 2020, we voluntarily recalled certain models of our ESS batteries in the United States and Korea after a number of fires allegedly relating to the use of such batteries were reported. The replacement of such batteries is currently ongoing, and we are unable to predict its impact on our business, financial condition and results of operations at this time.

In addition, in 2019, the Ministry of Trade, Industry and Energy of Korea (the "MOTIE"), as a result of its investigation that took place after a number of fires relating to the use of ESS batteries which occurred at industrial sites in Korea, determined that the fires may have been caused by, among others, the use of such ESS batteries, some of which were manufactured by us. Along with other ESS battery manufacturers in Korea, we participated in a reimbursement process with respect to customer losses resulting from the cessation of operations of facilities incorporating ESS batteries in addition to replacing the batteries that may have been the cause of the fires.

We could also become subject to claims from our customers and their employees for property damages and any injuries resulting from fires involving our batteries, as well as regulatory fines and penalties. While we have established provisions with respect to potential costs and losses relating to batteries sold to customers as discussed above, and we believe that our insurance policies will cover a portion of such costs and losses, there is no guarantee that such provisions and insurance coverage will be sufficient to cover all of our costs and losses relating to our batteries. In addition, our battery sales may be negatively impacted by the unfavorable publicity relating to our batteries in the short term. Accordingly, the fires involving our batteries and related costs and losses could adversely affect our reputation, business, financial condition and results of operations.

LG Energy Solution and we remain jointly and severally liable for each other's liabilities that were incurred prior to the split-off of LG Energy Solution.

Under the relevant provisions of the Korean Commercial Code relating to split-offs, both the subsidiary and the parent company remain jointly and severally liable after the corporate split-off for all of their liabilities existing prior to the corporate split-off unless such joint and several liability has been successfully eliminated through a special resolution adopted at a general meeting of shareholders and protection procedures for creditors of the affected debt, including consents of such creditors or provision of sufficient security for dissenting creditors. Accordingly, LG Energy Solution and we remain jointly and severally liable for each other's debts and other liabilities that existed prior to December 1, 2020, which is the record date of the split-off of LG Energy Solution, that currently remain outstanding. LG Energy Solution is the successor-in-title to all the assets and liabilities and rights and obligations that were related to the operations of the energy solutions segment conducted by us before the split-off, as well as all authorized licenses, employment relations, contracts and lawsuits that were directly related to such operations. The remaining assets and liabilities and rights and obligations related to other business areas remain with us, and LG Energy Solution remains jointly and severally liable for such liabilities. Defaults by LG Energy Solution of such liabilities, if significant, could have a material adverse effect on our results of operations and financial condition.

Exchange rate fluctuations between the Won and major foreign currencies may adversely affect our financial results.

Our consolidated financial statements are prepared from the local currency-denominated financial results, assets and liabilities of us and our subsidiaries around the world, which are then translated as necessary into Won. Accordingly, our consolidated financial results and assets and liabilities may be materially affected by fluctuations in exchange rates. A substantial portion of our revenue is denominated in currencies other than the Won, in particular the U.S. dollar, and our purchases of raw materials from overseas suppliers are denominated primarily in U.S. dollars and, to a lesser extent, Chinese Renminbi, Japanese Yen and Euros. To the extent that we incur costs in one currency and derive revenue in another currency, our results of operations may be affected by changes in the exchange rates between the two currencies.

Appreciation of the Won against major foreign currencies causes:

- our export products to be less competitive by raising prices of our products exported from Korea in foreign currency terms; and

- a decrease in Won terms in revenue and accounts receivable from overseas sales, which are primarily denominated in U.S. dollars.

Depreciation of the Won against major foreign currencies, on the other hand, causes:

- an increase in Won terms in costs denominated in such foreign currencies, including operating and non-operating costs, such as costs of raw materials that we purchase from overseas sources, expenses relating to labor, equipment and other manufacturing costs of our overseas operations and a substantial portion of our freight costs, which are denominated principally in U.S. dollars, Chinese Renminbi, Japanese Yen and Euros;

- an increase in the amount of Won required for us to make interest and principal payments on our foreign currency-denominated debt; and

- foreign exchange translation losses on foreign currency-denominated liabilities, which lower our earnings for accounting purposes.

Although the impact of exchange rate fluctuations has in the past been partially mitigated by strategies to take advantage of natural hedges, our results of operations have historically been affected by exchange rate fluctuations, and there can be no assurance that such strategies will be effective in eliminating or reducing the adverse impact of such fluctuations in the future. Due to the larger positive effects of the depreciation of the Won, appreciation of the Won against major foreign currencies in the past generally has had a net negative impact on our results of operations. Exchange rate fluctuations can also affect the Won value of our equity investments and monetary assets and liabilities denominated in foreign currencies. Exchange rate fluctuations have had and may in the future have an adverse impact on our business, financial condition and results of operations.

We rely on technology licensed from third parties for use in the production of certain products, and our business may suffer if we are unable to renew key licensing arrangements with them.

We produce some of our products under licensing or technical assistance agreements with overseas producers or technology providers. In general, these agreements provide for the grant to us of a license to manufacture and sell specific products both in Korea and overseas during a fixed but usually renewable term in return for the payment by us of royalties on our sales of these products, or for the provision of technical support for our production or research and development activities in return for the payment of a fixed fee. See "Business – Intellectual Property." We consider our licensing and technical assistance agreements to be important to our business, and any substantial reduction in the willingness of global producers or technology providers in our business segments to enter into such arrangements with us could adversely affect us. Based on our prior experience, we believe that we will be able to maintain our existing material licensing and technical assistance agreements as necessary on commercially reasonable terms. However, if we are unable to renew our key licensing or technical assistance arrangements on acceptable terms, we may lose the legal right to use some of the technologies or the processes we employ to manufacture certain products or only be able to maintain such right at a substantially higher cost. There can be no assurance that key licensing agreements can be renewed on acceptable terms or at all, and our failure to do so may have a material adverse impact on our business, financial condition and results of operations.

Failure to protect our intellectual property rights, trade secrets and unpatented proprietary know-how could impair our competitiveness and harm our business and future prospects.

We depend on our proprietary technologies and production know-how to maintain our competitive position in the markets in which we operate, and we believe that developing new or improved products or manufacturing or processing technologies that can be differentiated from those of our competitors is an important factor for the continued success of our business. We take active measures to protect our intellectual property by obtaining patents and undertaking monitoring activities in our major markets. However, there is no guarantee that the measures that we are taking will effectively deter competitors from improper use of our proprietary technologies. Our competitors may misappropriate our intellectual property, disputes as to ownership of intellectual property may arise or our intellectual property may otherwise become known or independently developed by our competitors. We also rely on trade secrets and unpatented proprietary know-how and information. To safeguard our intellectual property, we require our research and development employees and many of our customers to enter into confidentiality agreements prohibiting them from disclosing our proprietary information or technology. We cannot guarantee the enforceability of these types of agreements, or that they will not be breached. We also cannot be certain that we will have adequate remedies for any breach. Any failure to protect our material intellectual property or unauthorized disclosure of our trade secrets or other unpatented proprietary know-how could impair our competitiveness and harm our business and future prospects.

We may be exposed to infringement or misappropriation claims by third parties, which, if determined adversely to us, could cause us to lose significant rights and pay significant damages.

Our continued success depends on our ability to use and develop our technology and know-how without infringing the intellectual property rights of third parties. The validity and scope of claims relating to petrochemicals, energy solutions, advanced materials and pharmaceuticals technology involve complex scientific, legal and factual questions and analyses and, therefore, may be highly uncertain. Although we are currently not aware of any parties pursuing or intending to pursue infringement claims against us, there is no guarantee that we will not be subject to such claims in the future. Also, because patent applications in many jurisdictions are kept confidential for an extended period before they are published, we may be unaware of pending patent applications by other parties that relate to our technologies, products or processes.

The defense and prosecution of intellectual property suits, patent opposition proceedings and related legal and administrative proceedings can be both costly and time consuming and may significantly divert the efforts and resources of our technical and management personnel. An adverse determination in any such litigation or proceedings to which we may become a party could subject us to significant liability to third parties, require us to seek licenses from third parties, to pay ongoing royalties or to redesign our products or subject us to injunctions prohibiting the manufacture and sale of our products or the use of our technologies. Protracted litigation could also result in our customers deferring or limiting their purchase or use of our products until resolution of such litigation. The occurrence of any of the foregoing could have a material adverse effect on our business, financial condition and results of operations.

We are a party to various legal proceedings arising in the normal course of business or otherwise, which could adversely affect our business and reputation.

We may from time to time become a party to various litigation, arbitration or administrative proceedings arising in the ordinary course of business or otherwise. We are currently involved in various legal proceedings and claims that have not yet been fully resolved, and additional claims may arise in the future. See "Business – Legal Proceedings." Such proceedings are subject to significant uncertainty and may be expensive, time-consuming and disruptive to our operations. An adverse resolution of litigation, arbitration, administrative or other proceedings or actions to which we are a party could have a material adverse effect on our business, financial condition and results of operations, including as a result of injunctive and other non-monetary remedies. Additionally, any amount that we may be required to pay to satisfy a judgment, settlement, fine or penalty may not be covered by our liability insurance policies. Legal proceedings, and any adverse resolution thereof, can also result in adverse publicity and damage to our reputation, which could adversely impact our business.

If our cybersecurity is breached, we may incur significant legal and financial exposure, damage to our reputation and a loss of confidence of our customers.

Our business involves the storage and transmission of large amounts of confidential information relating to us as well as our customers and suppliers, and any breach in our cybersecurity could expose us to a risk of loss, the improper use or disclosure of such information, ensuing legal actions or potential liability, any of which could harm our reputation and adversely affect our business. Although there has been no material instance where an unauthorized party was able to obtain access to our data or our customers' data, there can be no assurance that we will not be vulnerable to cyber-attacks in the future.

Our cybersecurity measures may also fail due to employee error, malfeasance or otherwise. Instituting complete access controls and safeguards across our information technology infrastructure is challenging. Furthermore, outside parties may attempt to fraudulently induce employees to disclose sensitive information in order to gain access to our or our customers' data or accounts or may otherwise obtain access to such data or accounts. Because the techniques used to obtain unauthorized access, disable or degrade service or sabotage systems change frequently and often are not recognized until launched against a target, we may be unable to anticipate these techniques or implement adequate preventative measures. If an actual or perceived breach of our cybersecurity occurs or the market perception of the

effectiveness of our cybersecurity measures is adversely affected, we may incur significant legal and financial exposure, including legal claims and regulatory fines and penalties, damage to our reputation and a loss of confidence of our customers, which could have an adverse effect on our business, financial condition and results of operations.

Work stoppages and other labor-related issues may adversely affect our operations.

A significant number of our employees are members of our five labor unions, which are generally organized based on business segment and production site. We annually negotiate collective bargaining agreements and wage agreements with the labor unions, which were last entered into in November 2021 and December 2021 for collective bargaining agreements and March 2021 for wage agreements. Annual wage increases are determined jointly by employee and management representatives in consideration of our performance, the rate of inflation and economic growth in Korea and other relevant factors. We have not experienced any material labor disputes in recent years and consider our current relations with our workforce to be good. However, there can be no assurance that our relationship with our employees will not deteriorate in the future. Any labor unrest, work stoppages or strikes could prevent our production facilities from continuing normal operations, which, in turn, would have a material adverse effect on our business, financial condition and results of operations.

We are also subject to the local labor and employment laws of various jurisdictions outside of Korea in which we operate. Such local labor and employment laws may impose restrictions on charges to employment terms, downsizing or closure of facilities and employee terminations, which could impair our flexibility in streamlining or restructuring our current business structures in relevant jurisdictions.

Our success depends on the continuing efforts of our key personnel, and our business may be disrupted if we lose their services.

Our future success depends to a significant extent on the continued services of our senior management, engineers and technical personnel, and on our ability to continue to attract, retain and motivate such key personnel. There is substantial competition both in Korea and overseas for qualified personnel, and there can be no assurance that we will be able to attract or retain them. If one or more of our key executive officers, engineers or technicians retire or are unable or unwilling to continue in their present positions, it could be difficult to find and integrate replacement personnel in a timely manner or at all. The loss of the services of any of our key personnel without adequate replacement, or the inability to attract new qualified personnel, may have a material adverse effect on our business operations.

The interests of our principal shareholder could conflict with your interests.

As of March 31, 2022, LG Corp. owned approximately 33.3% of our outstanding common shares. As a result, LG Corp. would be in a position to significantly influence the election and removal of our directors and the outcome of most matters submitted to our shareholders' meetings for a vote. LG Corp. would also be able to control or significantly influence the outcome of any vote on any proposed amendment to our articles of incorporation, merger proposal, proposed substantial sale of assets or other major corporate transactions. The interests of LG Corp. as our principal shareholder could conflict with your interests, which could adversely affect your investment in us.

Risks Relating to Regulation

We are subject to strict environmental regulations that could cause our operations to be interrupted.

Due to the nature of our businesses, our operations generate a variety of chemicals, gases, by-products and other emissions and waste materials, and we are subject to various environmental laws and regulations in Korea and other jurisdictions in which we operate relating to the handling, use, storage, discharge, treatment and disposal of such materials. We are also subject to regulation and periodic monitoring by environmental protection authorities in various jurisdictions. We have incurred, and expect

to continue to incur, capital and operating costs to comply with such environmental laws and regulations. We may be responsible for the investigation and remediation of environmental conditions at our production sites, and we may also be subject to associated liabilities as well as regulatory fines and penalties, including liabilities for environmental damage, third party property damage or personal injury resulting from lawsuits brought by governmental authorities or private litigants. See "Business – Legal Proceedings." In the course of our operations, hazardous wastes may be generated at third party-owned or operated sites, and hazardous wastes may be disposed of or treated at third party-owned or operated disposal sites. If those sites become contaminated, we could also be held responsible for the cost of investigation and remediation of such sites, for any associated environmental damage, and for regulatory fines or penalties.

In order to comply with various environmental laws and regulations in Korea and other jurisdictions, we have installed various types of anti-pollution equipment as well as established an internal environmental law management system to continually monitor the legal trends and make any improvements as necessary. However, any failure on our part to comply with any present or future environmental regulations could result in the assessment of damages or imposition of fines or penalties against us or suspension of our production. In addition, more stringent environmental laws and regulations could require us to acquire additional anti-pollution equipment or incur other significant compliance expenses. Our non-compliance with the relevant environmental regulations, or the perception that we have not appropriately responded to growing consumer concerns for environmental issues, may adversely affect our reputation, business, financial condition and results of operations. See "Business – Environmental Matters."

Related party transactions are subject to scrutiny by the Korea Fair Trade Commission.

Our business relationships and transactions with our subsidiaries and affiliates are subject to ongoing scrutiny by the Korea Fair Trade Commission as to, among other things, whether such relationships and transactions constitute undue financial support among companies of the same business group. We engage in various transactions with our subsidiaries and affiliates on an arm's-length basis. See "Certain Relationships and Related Party Transactions." We are also subject to fair trade regulations limiting cross-guarantees of debt and cross-shareholdings among member companies of the LG Group. In addition, our material business transactions with our subsidiaries, affiliates and member companies of the LG Group are subject to approval by our board of directors pursuant to the Korean Commercial Code and the Monopoly Regulation and Fair Trade Act and are subject to public disclosure requirements under the Monopoly Regulation and Fair Trade Act. Any future determinations by the Korea Fair Trade Commission that we have engaged in transactions that violate the fair trade laws and regulations may result in fines or other punitive measures and may have a material adverse effect on our reputation and our business.

Related party transactions are subject to scrutiny by the Korean tax authorities.

Under Korean tax law, there is an inherent risk that our transactions with our subsidiaries, affiliates or any other person or company that is related to us may be challenged by the Korean tax authorities if such transactions are viewed as having been made on terms that were not on an arm's-length basis. If the Korean tax authorities determine that any of our transactions with related parties was not on an arm's-length basis, we would not be permitted to deduct the amount equivalent to such undue financial support as expenses, which may have adverse tax consequences for us.

Risks Relating to Korea

If economic conditions in Korea deteriorate, our current business and future growth could be materially and adversely affected.

We are incorporated in Korea, and a significant portion of our revenue is generated from sales in Korea. As a result, we are subject to economic, political, legal and regulatory risks specific to Korea, and our business, financial condition and results of operations, as well as the successful execution of our operational strategies, are substantially dependent on developments relating to the Korean economy. The economic indicators in Korea in recent years have shown mixed signs of growth and uncertainty, and future growth of the Korean economy is subject to many factors beyond our control, including developments in the global economy. Any future deterioration of the Korean or global economy could adversely affect our business, financial condition and results of operations.

In particular, the COVID-19 pandemic, and more recently, Russia's invasion of Ukraine and the ensuing sanctions against Russia, have had an adverse impact on the Korean economy. The Government has implemented a number of measures in order to contain the spread of the COVID-19 disease, including nationwide orders for social distancing, implementation of strict self-isolation and quarantine measures for those who may be infected and temporary closures of all school and other public facilities. In addition, the Government has undertaken a series of actions to mitigate the adverse impact of the COVID-19 pandemic on the Korean economy, including (i) lowering The Bank of Korea's policy rates, (ii) executing a bilateral currency swap agreement with the U.S. Federal Reserve, (iii) providing loans, guarantees and maturity extensions to eligible financial institutions, small- and medium business enterprises and self-employed business owners facing liquidity crises, (iv) offering emergency relief payments to those impacted by the COVID-19 pandemic, and (v) establishing the Key Industry Stabilization Fund in May 2020 to support businesses in certain key industries, such as the air transport and maritime industries. Although the Government has recently begun to ease some of these measures, the impact of the COVID-19 pandemic as well as Russia's invasion of Ukraine and the ensuing sanctions against Russia on the Korean economy in 2022 and for the foreseeable future remains highly uncertain.

Other developments that could have an adverse impact on the Korean economy include:

- declines in consumer confidence and a slowdown in consumer spending in the Korean or global economy;

- rising inflationary pressures leading to increases in the costs of goods and services and a decrease in purchasing power;

- the occurrence of additional severe health epidemics;

- adverse conditions or uncertainty in the economies of countries and regions that are important export markets for Korea, such as China, the United States, Europe and Japan, or in emerging market economies in Asia or elsewhere, including as a result of the COVID-19 pandemic, deteriorating relations between the United States and China and increased uncertainties resulting from the United Kingdom's exit from the European Union;

- hostilities, political or social tensions involving Russia (including the invasion of Ukraine by Russia and ensuing actions that the United States and other countries have taken or may take in the future) and the resulting adverse effects on the global supply of oil and other natural resources and the global financial markets;

- adverse changes or volatility in foreign currency reserve levels, commodity prices (including oil prices), exchange rates (including fluctuation of the U.S. dollar, the Euro or the Japanese Yen exchange rates or revaluation of the Chinese Renminbi), interest rates, inflation rates or stock markets;

- deterioration in economic or diplomatic relations between Korea and its trading partners or allies, including deterioration resulting from territorial or trade disputes or disagreements in foreign policy;

- increased sovereign default risks in select countries and the resulting adverse effects on the global financial markets;

- a deterioration in the financial condition or performance of small- and medium-sized enterprises and other companies in Korea due to the Government's policies to increase minimum wages and limit working hours of employees;

- investigations of large Korean business groups and their senior management for possible misconduct;

- a continuing rise in the level of household debt and increasing delinquencies and credit defaults by retail and small- and medium-sized enterprise borrowers in Korea;

- social and labor unrest;

- substantial decreases in the market prices of Korean real estate;

- a substantial decrease in tax revenues and a substantial increase in the Government's expenditures for fiscal stimulus measures, unemployment compensation and other economic and social programs, in particular in light of the Government's ongoing efforts to provide emergency relief payments to households and emergency loans to corporations in need of funding due to COVID-19, which, together, would likely lead to an increase in the Government's debt and a national budget deficit;

- the economic impact of any pending or future free trade agreements or of any changes to existing free trade agreements;

- financial problems or lack of progress in the restructuring of Korean business groups, other large troubled companies and their suppliers;

- loss of investor confidence arising from corporate accounting irregularities, allegations of corruption and corporate governance issues concerning certain Korean companies;

- increases in social expenditures to support an aging population in Korea or decreases in economic productivity due to the declining population size in Korea;

- geo-political uncertainty and the risk of further attacks by terrorist groups around the world;

- natural or man-made disasters that have a significant adverse economic or other impact on Korea or its major trading partners;

- political uncertainty or increasing strife among or within political parties in Korea;

- hostilities or political or social tensions involving oil producing countries in the Middle East and Northern Africa and any material disruption in the global supply of oil or sudden increase in the price of oil; and

- an increase in the level of tensions or an outbreak of hostilities between North Korea and Korea or the United States.

Escalations in tensions with North Korea could have an adverse effect on us and the market price of the Notes.

Relations between Korea and North Korea have been tense throughout Korea's modern history. The level of tension between the two Koreas has fluctuated and may increase abruptly as a result of current and future events. In particular, there have been heightened security concerns in recent years stemming from North Korea's nuclear weapon and ballistic missile programs as well as its hostile military actions against Korea. Some of the significant incidents in recent years include the following:

- North Korea renounced its obligations under the Nuclear Non-Proliferation Treaty in January 2003 and has conducted several rounds of nuclear tests since October 2006, including claimed detonations of hydrogen bombs, and warheads that can be mounted on ballistic missiles. Over the years, North Korea has also conducted a series of ballistic missile tests, including missiles launched from submarines and intercontinental ballistic missiles that it claims can reach the United States mainland. In response, the Government has repeatedly condemned the provocations and flagrant violations of relevant United Nations Security Council resolutions. Internationally, the United Nations Security Council has passed a series of resolutions condemning North Korea's actions and significantly expanding the scope of sanctions applicable to North Korea, most recently in December 2017 in response to North Korea's intercontinental ballistic missile test in November 2017. Over the years, the United States and the European Union have also expanded their sanctions applicable to North Korea.

- In March 2010, a Korean naval vessel was destroyed by an underwater explosion, killing many of the crewmen on board. The Government formally accused North Korea of causing the sinking, while North Korea denied responsibility. Moreover, in November 2010, North Korea fired more than one hundred artillery shells that hit Korea's Yeonpyeong Island near the Northern Limit Line, which acts as the de facto maritime boundary between Korea and North Korea on the west coast of the Korean peninsula, causing casualties and significant property damage. The Government condemned North Korea for the attack and vowed stern retaliation should there be further provocation.

North Korea's economy also faces severe challenges, which may further aggravate social and political pressures within North Korea. Although bilateral summit meetings were held between Korea and North Korea in April, May and September 2018 and between the United States and North Korea in June 2018, February 2019 and June 2019, there can be no assurance that the level of tensions affecting the Korean peninsula will not escalate in the future. Any further increase in tensions, which may occur, for example, if North Korea experiences a leadership crisis, high-level contacts between Korea and North Korea break down or military hostilities occur, could have a material adverse effect on the Korean economy and on our business, financial condition and results of operations and the price of the Notes, including a downgrade in our credit rating or the credit ratings of the Notes.

There are special risks involved with investing in securities of Korean companies, including the possibility of restrictions being imposed by the Government in emergency circumstances as well as accounting and corporate disclosure standards that differ from those in other jurisdictions.

You should carefully consider the risk factors listed in this section, together with all of the other information included in this offering circular, before you decide to purchase the Notes. As we are a Korean company, there are risks associated with investing in our securities that are not typical for investments in securities of U.S. or European companies. As a Korean company, we operate in a business and cultural environment that is different from that of other countries.

Under the Foreign Exchange Transactions Act of Korea, if the Government determines that certain emergency circumstances, including sudden fluctuations in interest rates or exchange rates, extreme difficulty in stabilizing the balance of payments or substantial disturbance in the Korean financial and capital markets, are likely to occur, it may impose any necessary restriction such as requiring Korean or foreign investors to obtain prior approval from the Minister of Economy and Finance for the acquisition of Korean securities or for the repatriation of interest, dividends or sales proceeds arising from Korean securities or from disposition of such securities or other transactions involving foreign exchange.

In addition, we prepare and present our financial statements in accordance with Korean IFRS, which differ in many material respects from accounting principles applicable to companies in certain other countries. We also make regulatory filings and disclosures regarding other aspects of our business in accordance with applicable rules and regulations and accepted practice in Korea. These filing and disclosure rules and practices differ in many material respects from those applicable to companies in certain other countries. There may also be less publicly available information about Korean companies, such as us, than is regularly made available by public companies in other countries. In making an investment decision, investors must rely upon their own examination of our company, the terms of the Notes and the financial and other information contained in this offering circular.

We are incorporated in Korea, and it may be more difficult to enforce judgments of U.S. courts.

We are a corporation with limited liability organized under the laws of Korea. Most of our directors, executive officers and certain other persons named in this offering circular are non-U.S. residents, and all or a significant portion of the assets of our directors, executive officers and certain other persons named in this offering circular and most of our assets are located or registered outside the United States. As a result, when compared to a U.S. company, it may be more difficult for investors to effect service of process in the United States upon us or to enforce against us, our directors or executive officers, judgments obtained in U.S. courts predicated upon civil liability provisions of the federal or state securities laws of the U.S. or similar judgments obtained in other courts outside Korea. There is doubt as to the enforceability in Korean courts, in original actions or in actions for enforcement of judgments of U.S. courts, of civil liabilities predicated solely upon the federal and state securities laws of the United States.

Risks Relating to the Notes

The Notes are unsecured obligations.

Because the Notes are unsecured obligations, their repayment may be compromised if:

- we enter into bankruptcy, liquidation, rehabilitation or other winding-up proceedings;
- there is a default in payment under our future secured indebtedness or other unsecured indebtedness; or
- there is an acceleration of any of our indebtedness.

If any of these events occurs, our assets may not be sufficient to pay amounts due on any of the Notes. In addition, any secured indebtedness incurred by us would have priority over our unsecured indebtedness to the extent of the assets securing such indebtedness.

The Notes are subject to transfer restrictions.

The Notes will not be registered under the Securities Act or any state securities laws and may not be offered or sold within the United States except to QIBs in reliance on the exemption provided by Rule 144A, to certain persons in offshore transactions in reliance on Regulation S, or, if available, pursuant to another exemption from, or in another transaction not subject to, the registration requirements of the Securities Act and, in each case, in accordance with applicable state securities laws. In addition, subject to the conditions set forth in the applicable Fiscal Agency Agreement (as defined in "Terms and Conditions of the Notes"), a Note may be transferred only if the principal amount of Notes transferred is at least U.S.$200,000. For a further discussion of the transfer restrictions applicable to the Notes, see "Terms and Conditions of the Notes" and "Transfer Restrictions."

The Notes have not been and will not be registered with the Financial Services Commission of Korea under the Financial Investment Services and Capital Markets Act of Korea. Accordingly, the Notes may not be offered or sold, directly or indirectly, in Korea or to any resident of Korea (as such term is defined under the Foreign Exchange Transactions Act of Korea and its Enforcement Decree) except as otherwise permitted by applicable Korean laws and regulations. In addition, during the first year after the issuance of the Notes, the Notes may not be transferred to any resident of Korea other than a "qualified institutional buyer" (a "Korean QIB", as defined in the Regulation on Securities Issuance, Public Disclosure, Etc. of Korea) who is registered with the Korea Financial Investment Association for Korean QIB bond trading. Furthermore, the Notes acquired by all Korean QIBs at the time of issuance must be no more than 20% of the aggregate principal amount of the Notes.

The Notes are subject to prescription regulations in Korea.

Failure to exercise a right of action for more than a certain period of time may operate as a bar to exercise of such right. Under Korean laws, claims against the issuer in respect of the payment of principal of notes or bonds are prescribed upon the expiry of 10 years, and claims for payment of interest in respect of notes or bonds are prescribed upon the expiry of five years, in each case, from the relevant due date as adjusted by any acceleration or otherwise, in respect thereof. If the Holders fail to exercise his or her right of payment for more than the period set forth above, the Korean courts may not enforce a claim for payment for principal or interest in respect of the Notes.

The Notes contain limited restrictive covenants and will not restrict our ability to make investments, incur unsecured indebtedness or pay dividends.

The Notes contain limited restrictive covenants and will not restrict our ability to:

- invest in affiliates, associate or subsidiaries;
- repurchase common or preferred shares, make distributions or issue dividends;
- issue preferred securities or incur unsecured indebtedness; or
- make capital expenditures.

Our taking such actions could adversely affect our ability to pay amounts due on the Notes.

An active trading market for the Notes may not develop.

The Notes are a new issue of securities for which there is currently no trading market. No assurance can be given that an active trading market for the Notes will develop or as to the liquidity or sustainability of any such market, the ability of holders to sell their Notes or the price at which holders will be able to sell their Notes. The Initial Purchasers are not obliged to make a market in the Notes and any such market making, if commenced, may be discontinued at any time at the sole discretion of the Initial Purchasers.

If an active trading market for the Notes does not develop or is not maintained, the market price and liquidity of the Notes may be adversely affected. If such a market were to develop, the Notes could trade at prices that may be higher or lower than the price at which the Notes are issued depending on many factors, including:

- prevailing interest rates;
- our results of operations and financial condition;
- the rate of exchange between Won and the currency of the Notes;
- political and economic developments in and affecting Korea and other regions;

- the market conditions for similar securities; and
- the financial condition and stability of the Korean petrochemical and other sectors.

The ratings assigned to the Notes may be lowered or withdrawn in the future.

The Notes are expected to be rated "A3" by Moody's and "BBB+" by S&P. A rating is not a recommendation to buy, sell or hold securities and may be subject to revision, suspension or withdrawal at any time. We cannot assure investors that a rating assigned to the Notes will remain for any given period of time or that a rating assigned to the Notes will not be lowered or withdrawn entirely by the relevant rating agency if in its judgment circumstances in the future so warrant. We have no obligation to inform holders of Notes of any such revision, suspension or withdrawal. A revision, suspension, or withdrawal at any time of a rating assigned to the Notes may adversely affect the market price of the Notes.

The Notes may not be a suitable investment for all investors seeking exposure to "green" assets.

We will allocate an amount equivalent to the net proceeds from the issuance of the Notes to finance new Eligible Green Bond Projects (as defined in "Use of Proceeds") in accordance with our Green Financing Framework, which is in alignment with the Green Bond Principles 2021 published by the International Capital Markets Association and the Green Loan Principles 2021 published by the Loan Market Association. See "Use of Proceeds." The examples of Eligible Green Bond Projects provided in "Use of Proceeds" section are for illustrative purposes only and no assurance can be provided that disbursements for projects with these specific characteristics will be made by us during the term of the Notes. Our Green Financing Framework and the Second Party Opinion (as defined in "Use of Proceeds") are not incorporated into, and do not form a part of, this offering circular.

There is currently no market consensus on what precise attributes are required for a particular project or series of notes to be defined as "green," and therefore no assurance can be provided to investors that selected Eligible Green Bond Projects will meet all investor expectations regarding environmental performance. Although the Eligible Green Bond Projects will be selected in accordance with the categories recognized under our Green Financing Framework, and will be developed in accordance with relevant legislation and standards, there can be no guarantee that the projects will deliver the environmental benefits as anticipated, or that adverse environmental and/or social impacts will not occur during the design, construction, commissioning and operation of the projects. In addition, where any negative impacts are insufficiently mitigated, the projects may become controversial and may be criticized by activist groups or other stakeholders.

The Second Party Opinion may not reflect the potential impact of all risks related to the structure, market, additional risk factors discussed above and other factors that may affect the value of the Notes. The Second Party Opinion is not a recommendation to buy, sell or hold securities and is only current as of the date that the Second Party Opinion was initially issued. In addition, although we have agreed to certain reporting and use of proceeds obligations in connection with certain environmental criteria, our failure to comply with such obligations does not constitute a breach or an event of default under the Notes. A withdrawal of the Second Party Opinion or any failure by us to use an amount equivalent to the net proceeds from the issuance of the Notes on Eligible Green Bond Projects or to meet or continue to meet the investment requirements of certain environmentally-focused investors with respect to the Notes may affect the value of the Notes and may have consequences for certain investors with portfolio mandates to invest in "green" assets.

No assurance can be provided by the Issuer or any of the Joint Lead Managers with respect to the suitability of the Second Party Opinion or that the Notes will fulfill the environmental and sustainability criteria to qualify as "green" bonds. The Joint Lead Managers have not undertaken, nor are responsible for, any assessment of the eligibility of projects within the definition of Eligible Green Bond Projects or the monitoring of the use of proceeds from the offering of the Notes and therefore no assurance can be provided by the Joint Lead Managers that the Green Bond Proceeds will be used for Eligible Green Bond Projects. Each potential purchaser of Notes should determine for itself the relevance of the information contained in this offering circular regarding the use of proceeds and its purchase of Notes should be based upon such investigation as it deems necessary.

Risks Relating to Forward-Looking Statements

This offering circular contains forward-looking statements that are our management's present expectations of future events and are subject to certain factors and uncertainties that could cause actual results to differ materially from those described in the forward-looking statements.

In addition to the risks related to our business discussed above, other factors could cause actual results to differ materially from those described in the various forward-looking statements contained in this offering circular. These factors include, but are not limited to, the following:

- general economic, business and political conditions;
- a prolonged outbreak of COVID-19 or other types of widespread infectious diseases;
- adverse trends in regulatory, legislative and judicial developments;
- the ability of third parties to perform in accordance with contractual terms and specifications;
- changes in interest rates;
- our leverage and our ability to meet our debt obligations;
- declines in consumer confidence;
- changes in competitive conditions in the Korean or global petrochemical industry; and
- conditions in the financial markets.

By their nature, certain disclosures relating to these and other risks are only estimates and should one or more of these uncertainties or risks, among others, materialize, actual results may vary materially from those estimated, anticipated or projected, as well as from historical results. Specifically, but without limitation, revenue could decrease, costs could increase, capital costs could increase, capital investment could be delayed and anticipated improvements in performance may not be fully realized.

We caution you not to place undue reliance on the forward-looking statements, which speak only as of the date of this offering circular. Except as required by law, we are not under any obligation, and expressly disclaim any obligation, to update or alter any forward-looking statements, whether as a result of new information, future events or otherwise. All subsequent forward-looking statements attributable to us or any person acting on our behalf are expressly qualified in their entirety by the cautionary statements contained or referred to in this section.

USE OF PROCEEDS

The net proceeds from the issuance of the Notes are expected to be U.S.$, after deducting a combined management and underwriting commission but not estimated expenses of the Offering. We will allocate an amount equivalent to the net proceeds from the issuance of the Notes ("Green Bond Proceeds") to finance new projects related to (i) low carbon transportation, (ii) energy efficiency, (iii) sustainable water and wastewater management and (iv) green buildings ("Eligible Green Bond Projects") in accordance with our Green Financing Framework, which is in alignment with the Green Bond Principles 2021 published by the International Capital Markets Association and the Green Loan Principles 2021 published by the Loan Market Association.

Examples of Eligible Green Bond Projects include the following:

- Renewable energy: development of renewable energy technology through capital investment and expenditures related to the manufacture of raw materials, such as POE, which is required for the development of solar encapsulant films, as well as capital investment related to the expansion of existing facilities;

- Circular economy: increase the usage of bio-feedstock in the production of plastics through capital investment and expenditures related to the productions of bio-diesel, naphtha and bio-based plastic using bio-feedstock, as well as expenditures relating to the mechanical and chemical recycling of plastic waste; and

- Clean transportation: reduce carbon emission levels through capital investment and expenditures related to the manufacture of raw materials for electric vehicles, fuel-cell electric vehicles and energy storage systems.

Project Evaluation and Selection Process

Under our asset evaluation and selection process, Eligible Green Bond Projects will be assessed and identified using the criteria indicated above by our Green Financing Working Group, which is composed of various business units, which will be subject to final approval by our Investment Committee. The Green Financing Working Group will review and approve the allocation of proceeds on an annual basis.

Management of Proceeds

The Green Bond Proceeds will be allocated by our finance department to various internal teams responsible for carrying out the Eligible Green Bond Projects. We plan to establish a Green Bond or Loan Register to manage the allocation of Green Bond Proceeds, which will be reviewed by the Green Financing Working Group on an annual basis. Any balance of Green Bond Proceeds not yet allocated to Eligible Green Bond Projects will be managed in accordance with our general liquidity management policies and may be invested in cash, cash equivalents, investment grade securities or other marketable securities and short-term instruments or other capital management activities.

Reporting

Reporting will include allocation reporting and impact reporting and will be publicly available on our website. Allocation reports will be available to investors within approximately one year from the date of issuance of the Notes and annually thereafter until the Green Bond Proceeds have been completely allocated. Until complete allocation, impact reports, including relevant impact metrics, will be provided on an annual basis for each category of Eligible Green Bond Projects on a best efforts basis. DNV Business Assurance Korea Ltd., an external consultant, issued an opinion dated June 21, 2021 regarding the suitability of the Notes as an investment in connection with certain environmental criteria (the "Second Party Opinion"). The Second Party Opinion and our Green Financing Framework are publicly available on the following website: https://www.lgchem.com/sustainability/esg-bond. The Green Financing Framework and the Second Party Opinion are not incorporated into, and do not form part of, this Offering Circular.

EXCHANGE RATES

The table below sets forth, for the periods and dates indicated, information concerning the Market Average Exchange Rate for U.S. dollars. We do not intend to imply that the Won or U.S. dollar amounts referred to herein could have been or could be converted into U.S. dollars or Won, as the case may be, at any particular rate, or at all.

Period	At End of Period	Average Rate[(1)]	High	Low
		(Won per U.S.$1.00)		
2017	1,071.4	1,130.8	1,208.5	1,071.4
2018	1,118.1	1,100.3	1,142.5	1,057.6
2019	1,157.8	1,165.7	1,218.9	1,111.6
2020	1,088.0	1,180.1	1,280.1	1,082.7
2021	1,185.5	1,144.4	1,199.1	1,083.1
2022 (through June 29)	1,284.9	1,232.4	1,300.7	1,185.5
January	1,202.4	1,194.0	1,202.4	1,185.5
February	1,202.7	1,198.3	1,205.7	1,192.1
March	1,210.8	1,221.0	1,241.7	1,203.6
April	1,269.4	1,232.3	1,269.4	1,210.7
May	1,245.8	1,269.9	1,286.4	1,245.8
June (through June 29)	1,284.9	1,276.5	1,300.7	1,238.4

Source: Seoul Money Brokerage Services

(1) Represents the average of the daily Market Average Exchange Rate for U.S. dollars over the relevant period.

CAPITALIZATION

The following table sets forth our capitalization (defined as the sum of our long-term borrowings, net of current portion, and our total equity) as of March 31, 2022, on an actual basis and adjusted to give effect to the issuance of the Notes offered hereby.

You should read the information set forth below in conjunction with "Summary Financial Data," "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated interim financial statements appearing elsewhere in this offering circular.

	As of March 31, 2022	
	Actual	As adjusted[(1)]
	(In billions of Won)	
Long-term borrowings:		
Long-term borrowings (net of current portion)	₩10,324	₩ 10,324
Notes offered hereby	–	
Total long-term borrowings	10,324	
Equity:		
Share capital	391	391
Capital surplus	11,408	11,408
Other components of equity	(37)	(37)
Accumulated other comprehensive income	718	718
Retained earnings	17,842	17,842
Non-controlling interests	5,169	5,169
Total equity	35,491	35,491
Total capitalization	₩45,815	₩

(1) Reflects net proceeds of U.S.$ from the Offering (after deducting a combined management and underwriting commission but not estimated expenses of the Offering) translated into Won at Won 1,210.8 to U.S.$1.00, the applicable Market Average Exchange Rates in effect as of March 31, 2022. No representation is made that the Won or U.S. dollar amounts referred to herein could have been or could be converted into U.S. dollars or Won, as the case may be, at any particular rate or at all.

There has been no material change in our capitalization since March 31, 2022.

SELECTED FINANCIAL DATA

The following tables set forth our selected financial data. Our selected financial data as of and for the years ended December 31, 2019, 2020 and 2021 set forth below has been derived from our audited consolidated financial statements included elsewhere in this offering circular. Our selected financial data as of March 31, 2022 and for the three months ended March 31, 2021 and 2022 set forth below has been derived from our unaudited consolidated interim financial statements included elsewhere in this offering circular. It is important that you read our selected financial data set forth below in conjunction with our consolidated financial statements and the related notes, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and other historical financial information appearing elsewhere in this offering circular. Our consolidated financial statements included in this offering circular have been prepared in accordance with Korean IFRS. Our unaudited consolidated interim financial statements included in this offering circular have also been prepared in accordance with Korean IFRS 1034 "*Interim Financial Reporting*." Our results of operations for the three months ended March 31, 2022 may not be indicative of our results of operations for the full year 2022.

Selected Consolidated Statements of Comprehensive Income Data

	For the Year Ended December 31,			For the Three Months Ended March 31,	
	2019[(1)]	2020	2021	2021	2022
	(in billions of Won, other than per share data)				
Revenue	₩ 27,353	₩ 30,059	₩ 42,655	₩ 9,645	₩11,608
Cost of sales	(22,667)	(23,741)	(31,436)	(7,187)	(9,110)
Gross profit	4,686	6,317	11,218	2,458	2,498
Selling and administrative expenses	(3,860)	(4,512)	(6,193)	(1,049)	(1,473)
Operating profit	825	1,805	5,025	1,409	1,024
Finance income	286	417	687	158	196
Finance costs	(421)	(1,109)	(661)	(195)	(239)
Share of net profit of associates and joint ventures accounted for using the equity method	22	9	(7)	2	(7)
Other non-operating income	519	1,155	903	316	287
Other non-operating expenses	(657)	(1,327)	(1,057)	(263)	(238)
Profit before income tax	574	952	4,891	1,428	1,024
Income tax expense	(169)	(368)	(1,236)	(384)	(254)
Profit from continuing operations	405	584	3,655	1,044	770
Profit (loss) from discontinued operations	(29)	99	299	327	(1)
Profit for the period	376	682	3,954	1,371	769
Other comprehensive income (loss) for the year, net of tax	72	(70)	847	207	205
Total comprehensive income for the period	449	612	4,801	1,578	975
Profit attributable to:					
Owners of the parent company	313	513	3,670	1,307	688
Profit from continuing operations	343	414	3,371	980	689
Profit (loss) from discontinued operations	(29)	99	299	327	(1)
Non-controlling interests	63	170	284	64	81
Total comprehensive income for the period attributable to:					
Owners of the parent company	383	452	4,414	1,493	853
Non-controlling interests	65	160	388	85	122

(1) In March 2020, we substantially discontinued our glass substrate business, and in February 2021, we disposed of our LCD polarizer business. In July 2021, we disposed of all of our shares of Ugimag. All such businesses were presented as discontinued operations in our consolidated financial statements as of and for the year ended December 31, 2021 and our unaudited consolidated interim financial statements as of and for the three months ended March 31, 2022, and the comparative consolidated financial statements for the year ended December 31, 2020 included in the 2021/2020 Financial Statements and the comparative consolidated interim financial statements for the three months ended March 31, 2021 included in the Consolidated Interim Financial Statements, were recast to retrospectively reflect such presentation. However, our consolidated financial statements as of and for the years ended December 31, 2020 and 2019 included in the 2020/2019 Financial Statements were recast to retrospectively reflect only the discontinuations of the glass substrate business and LCD polarizer business, and they were not recast to retrospectively reflect the disposal of our shares of Ugimag. Accordingly, our financial information as of and for the years ended December 31, 2021 and 2020 (in the case of 2020, included in the 2021/2020 Financial Statements) and for the three months ended March 31, 2022 and 2021 may not be directly comparable to our financial information as of and for the year ended December 31, 2019. See "Presentation of Financial Information," as well as Note 34.2 of the notes to our 2021/2020 Financial Statements and Note 34.2 of the notes to our Consolidated Interim Financial Statements, included elsewhere in this offering circular.

Selected Consolidated Statements of Financial Position Data

	As of December 31,			As of March 31,
	2019	2020	2021	2022
	(in billions of Won)			
Assets				
Current assets				
Cash and cash equivalents	₩ 1,889	₩ 3,274	₩ 3,761	₩ 9,052
Trade receivables	3,738	5,298	6,387	7,019
Other receivables	267	924	1,049	6,313
Other current financial assets	11	24	23	68
Prepaid income taxes	118	17	156	166
Other current assets	794	643	749	829
Inventories	5,034	5,350	8,283	9,312
Assets held for sale	20	789	5	5
Total current assets	11,870	16,320	20,414	32,765
Non-current assets				
Trade receivables	–	29	67	75
Other receivables	173	255	713	598
Other non-current financial assets	160	82	506	593
Investments in associates and joint ventures	308	309	535	531
Deferred tax assets	517	1,410	1,905	1,989
Property, plant and equipment	18,594	20,567	24,378	25,232
Intangible assets	2,206	2,280	2,444	2,492
Investment properties	53	49	56	57
Other non-current assets	144	87	116	87
Total non-current assets	22,155	25,069	30,721	31,653
Total assets	₩34,024	₩41,389	₩51,135	₩64,417
Liabilities				
Current liabilities				
Trade payables	2,380	3,459	3,742	4,691
Other payables	4,143	5,267	3,992	3,203
Borrowings	1,356	1,549	3,477	4,370
Other current financial liabilities	–	17	–	–
Provisions	472	1,041	1,573	1,430
Income tax payables	85	373	958	1,328
Other current liabilities	506	788	1,321	1,944
Liabilities held for sale	–	130	–	–
Total current liabilities	8,942	12,624	15,062	16,966
Non-current liabilities				
Other payables	11	12	16	16
Borrowings	7,058	8,637	11,289	10,324
Other non-current financial liabilities	1	42	0	–
Provisions	265	329	637	559
Net defined benefit liabilities	179	118	18	40
Deferred tax liabilities	52	690	714	846
Other non-current liabilities	133	147	190	175
Total non-current liabilities	7,699	9,974	12,863	11,961
Total liabilities	₩16,641	₩22,598	₩27,925	₩28,926
Equity				
Share capital	391	391	391	391
Capital surplus	2,275	2,692	2,696	11,408
Other components of equity	(374)	(55)	(37)	(37)
Accumulated other comprehensive income	(85)	(165)	551	718
Retained earnings	14,799	15,175	18,092	17,842
Equity attributable to owners of the parent company	17,005	18,039	21,694	30,322
Non-controlling interests	379	751	1,516	5,169
Total equity	17,384	18,790	23,210	35,491
Total liabilities and equity	₩34,024	₩41,389	₩51,135	₩64,417

Other Financial Data

	For the Year Ended December 31,			For the Three Months Ended March 31,	
	2019	2020	2021	2021	2022
	(in billions of Won)				
Capital expenditures[(1)]	₩ 6,238	₩ 5,536	₩ 5,774	₩1,179	₩ 2,182
Depreciation and amortization	1,795	2,270	2,836	626	793
Net cash inflow from operating activities	3,121	5,841	5,510	1,066	156
Net cash outflow from investing activities	(6,111)	(5,296)	(5,349)	(38)	(7,264)
Net cash inflow from financing activities	2,301	938	124	688	12,337

(1) Capital expenditures represent cash used in the acquisition of property, plant and equipment.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis of our consolidated financial information as of December 31, 2019, 2020 and 2021 and March 31, 2022 and for the years ended December 31, 2019, 2020 and 2021 and the three months ended March 31, 2021 and 2022 should be read in conjunction with our consolidated financial statements and related notes included in this offering circular, which have been prepared in accordance with Korean IFRS.

Overview

We are a leading global chemical company and the largest chemical company in Korea in terms of revenue. We manufacture and sell domestically and overseas a broad range of upstream and downstream petrochemical products, as well as rechargeable batteries and core materials used in the IT and automobile industries, among others. In addition, we are engaged in the manufacture and sale of pharmaceuticals, vaccines, diagnostic kits and fine chemicals. Specifically, our business comprises the following five segments:

- ***Petrochemicals.*** The petrochemicals segment, which is our largest business segment, manufactures and sells petrochemical products, including basic materials produced at our NCCs and synthetic resins and other products manufactured by processing such basic materials.

- ***LG Energy Solution.*** Our subsidiary LG Energy Solution, which comprises our energy solutions segment, manufactures and sells rechargeable lithium ion batteries used in mobile devices and electric vehicles, as well as ESS batteries for renewable energy. LG Energy Solution was established in December 2020 through a split-off of our energy solutions segment.

- ***Advanced materials.*** The advanced materials segment manufactures and sells core materials for advanced products such as batteries, displays, semiconductors, automotive parts and water treatment filters.

- ***Life sciences.*** The life sciences segment manufactures and sells a variety of pharmaceuticals, vaccines, diagnostic kits and fine chemicals for primary and specialty care as well as aesthetics.

- ***Common and others.*** The common and others segment includes operations relating to crop protection products and fertilizers conducted through our wholly-owned subsidiary FarmHannong, as well as supporting divisions, including general management, sales and research and development.

In March 2020, we substantially discontinued our glass substrate business, and in February 2021, we disposed of our LCD polarizer business. In July 2021, we disposed of all of our shares of Ugimag. All such businesses were presented as discontinued operations in our consolidated financial statements as of and for the year ended December 31, 2021 and our consolidated interim financial statements as of and for the three months ended March 31, 2022, and the comparative consolidated financial statements for the year ended December 31, 2020 included in the 2021/2020 Financial Statements and the comparative consolidated interim financial statements for the three months ended March 31, 2021 included in the Consolidated Interim Financial Statements, were recast to retrospectively reflect such presentation. However, our consolidated financial statements as of and for the years ended December 31, 2020 and 2019 included in the 2020/2019 Financial Statements were recast to retrospectively reflect only the discontinuations of the glass substrate business and LCD polarizer business, and they were not recast to retrospectively reflect the disposal of our shares of Ugimag. Accordingly, our financial information as of and for the years ended December 31, 2021 and 2020 (in the case of 2020, included in the 2021/2020 Financial Statements) and for the three months ended March 31, 2022 and 2021 may not be directly comparable to our financial information as of and for the year ended December 31, 2019. See "Presentation of Financial Information," as well as Note 34.2 of the notes to our 2021/2020 Financial Statements and Note 34.2 of the notes to our Consolidated Interim Financial Statements, included elsewhere in this offering circular.

Factors Affecting Our Results of Operations and Financial Condition

Our results of operations and financial condition, including our revenue, operating profit and margins, have been and will continue to be materially affected by a number of factors, some of which are outside of our control, including:

- market conditions in a number of industries, including the petrochemical, IT and automobile industries, which are sensitive to general economic conditions;
- changes in the prices of naphtha and crude oil;
- changes in our product mix;
- the level of, and returns on, our capital expenditures and production capacity expansion; and
- fluctuations in exchange rates.

Market Conditions in a Number of Industries, Including the Petrochemical, IT and Automobile Industries, which are Sensitive to General Economic Conditions

Our results of operations and financial condition are affected by highly cyclical market demand for our intermediate products used as raw materials, additives or components by a number of industries, including the petrochemical, IT and automobile industries, which are sensitive to general conditions in the Korean and global economies. Macroeconomic factors, such as the economic growth rate, employment levels, interest rates, inflation rates, exchange rates, commodity prices, demographic trends and fiscal policies of governments can have a significant effect on such industries. In particular, the COVID-19 pandemic, and more recently, Russia's invasion of Ukraine and the ensuing sanctions against Russia, have materially and adversely affected the global economy and financial markets since early 2020, adding uncertainty to the overall prospects for the Korean and global economies in 2021 and beyond. See "Risk Factors – Risks Relating to Our Business – The ongoing global COVID-19 pandemic and any possible recurrence of other types of widespread infectious diseases could materially and adversely affect our business, results of operations or financial condition" and "Risk Factors – Risks Relating to Our Business – We operate in highly competitive markets, and our failure to successfully compete would adversely affect our market position and business." Such uncertainties, along with an actual or anticipated deterioration of Korean or global economic conditions, have resulted in and may, in the future, result in a decline in demand for our products used by the petrochemical, IT or automobile industry, which account for a substantial majority of our revenue and operating profit, which, in turn, have had and could again have a negative impact on the sales volume of such products as well as the prices at which such products can be sold. In such a case, we face pressure to lower prices, and we may need to rationalize our production capacity and reduce our operating costs. Our ability to reduce expenditures for production facilities, labor and research and development during industry downturns is limited because of the need to maintain our competitive position.

China is one of the largest markets for petrochemical-based products, rechargeable batteries and advanced materials globally and our largest overseas market in terms of revenue. Global prices and our sales volume of such products are in significant part influenced by China's actual and anticipated levels of consumption of such products, which are, in turn, dependent on the economic and market conditions and growth rates in China as well as in China's export markets. Any actual or anticipated decrease in Chinese consumption as a result of a slowdown in China's economic growth or otherwise could lead to an imbalance in supply and demand, which would result in downward pressure on prices of our petrochemical-based products, rechargeable batteries or advanced materials, as well as on our sales volume of such products. See "Risk Factors – Risks Relating to Our Business – Decreases in demand for our products in China may adversely affect our business and performance."

Changes in the Price of Naphtha and Crude Oil

Naphtha, which is produced by refining crude oil, is the principal feedstock used in the production of petrochemical-based products sold by our petrochemicals segment, which accounts for a significant portion of our revenue and operating profit. As naphtha constitutes a significant component of our raw material requirements, our financial performance, including gross margins, is significantly impacted by the market price of naphtha, which, in turn, is affected by the market price and supply of crude oil.

The market price and supply of crude oil are subject to a variety of factors that are beyond our control, including the following:

- the continued negative impact of the global COVID-19 pandemic, as well as other unexpected events such as large-scale natural disasters and health epidemics affecting the global economy;
- hostilities, political or social tensions involving Russia, including the invasion of Ukraine by Russia and ensuing actions that the United States and other countries have taken or may take in the future;
- political developments and instability in petroleum producing regions, in particular, the Middle East;
- activities of the Organization of Petroleum Exporting Countries and other petroleum producing nations in setting and maintaining production levels and, therefore, market prices;
- the development, market prices and supply levels of substitute energy sources, such as liquefied natural gas, coal, nuclear energy, solar energy and hydropower;
- the level of commitment and investment by governments and private sector enterprises in new, greenfield exploration projects and the success of such activities in increasing the global supply of crude oil for commercial applications;
- Korean as well as foreign government regulations with respect to the oil and energy industries in general;
- the growth in demand for energy resources in China and other large emerging economies;
- global weather conditions;
- exchange rate and interest rate fluctuations;
- expectations of inflation; and
- overall Korean and global economic conditions.

We have historically been able to pass on increases in naphtha and other raw material prices to our customers through price increases, and the impact of fluctuations in raw material prices has in the past been partially mitigated by such product price adjustments. However, because there is a time lag of generally one to two months before an increase in the market price of naphtha is reflected in the prices of our petrochemical products, there is no guarantee that we will continue to be able to pass along such increased costs to our customers without negatively impacting customer demand or our long-term relationships with customers. See "Risk Factors – Risks Relating to Our Business – Fluctuations in the market price of naphtha, which, in turn, is affected by the market price and supply of crude oil, may adversely affect our margins and profits."

Changes in Our Product Mix

We operate several business segments in different industries with a wide variety of product offerings. Our operating results depend to a significant extent on the changing levels of demand for our various products, as well as our ability to anticipate and respond to emerging industry standards and customer preferences by ensuring continued development of new, as well as enhancements to existing, products in a timely and cost-effective manner. The markets for our products, particularly our energy solutions and advanced materials segment products, are characterized by changing technology and evolving industry standards, often resulting in product obsolescence or short product lifecycles. Accordingly, we continually review and seek to adjust our product mix based on the demand for, and our assessment of the profitability of, our products in different industries and markets. For example, demand for LCD products has weakened in recent years in favor of new display technologies such as OLED, and we have accordingly expanded our OLED films and encapsulates operations to maintain our competitiveness.

More generally, we have been seeking to further diversify our business and product offerings to mitigate the effects on our operations of cyclical fluctuations, especially in the petrochemical industry. For example, as part of our long-term business strategy, we have made significant investments for research and development and production of rechargeable lithium ion batteries for electric vehicles, and in order to more effectively conduct such operations, in December 2020, we split off our energy solutions segment and established LG Energy Solution as a subsidiary. See "Business – Our Business Segments and Products – Energy Solutions." The market for rechargeable automotive batteries has been expanding at a rapid pace due to the strengthening of fuel efficiency standards in many countries, major advances in the electric vehicle technology and the increasing cost-competitiveness of electric vehicles compared to traditional internal combustion engine vehicles, and we expect demand for automotive batteries to continue to grow in the future. Accordingly, we may, through LG Energy Solution, continue to invest in increasing capacity at our automotive battery production facilities. See "Business – Production Facilities."

In the past, as part of our business strategy to diversify our product offerings, we merged with a former affiliate, LG Life Sciences, in January 2017, which added the life sciences segment to our business, and acquired FarmHannong in April 2016, which added operations relating to crop protection products, fertilizers and seeds to our business. We believe that demand for such products is generally less sensitive to cyclical changes in economic conditions and that such products present significant growth opportunities.

There is no guarantee that our efforts to anticipate and respond to changing market demand and to adjust and diversify our product offerings accordingly will continue to be successful in the future. Such efforts as well as changes to our product mix resulting therefrom have in the past had, and may continue to have, a material effect on our revenue, operating profit and margins.

Level of, and Returns on, Our Capital Expenditures and Production Capacity Expansion

We operate in industries such as the petrochemical, rechargeable battery and advanced materials industries, where producers with economies of scale enjoy a competitive advantage. Accordingly, our business requires a significant amount of capital investment for the expansion, upgrading and maintenance of production facilities and equipment as well as storage and transportation infrastructure on a timely and cost-effective basis in order to maintain long-term competitiveness and improve profitability. Our total capital expenditures (consisting of cash used in the acquisition of property, plant and equipment) amounted to Won 6,238 billion in 2019, Won 5,536 billion in 2020, Won 5,774 billion in 2021, Won 1,179 billion for the three months ended March 31, 2021 and Won 2,182 billion for the three months ended March 31, 2022. We plan to continue to invest in enhancing our production facilities and upgrading our equipment and manufacturing processes in order to increase our production capacity, achieve additional economies of scale and support production of new products. We plan to spend approximately Won 9 trillion in 2022 (including amounts already expended in the three months ended March 31, 2022), principally for the construction of separator production facilities in Hungary, the construction of POE and PBAT facilities in Daesan, the expansion of NBL facilities in Malaysia and the expansion of cathode materials production facilities in Gumi. See "Business – Production Facilities."

Increased capital expenditures lead to increases in depreciation and amortization expenses as well as financing costs related to such expenditures. The level of capital expenditures we make, as well as the returns we are able to achieve on our capital expenditure investments, have in the past affected and may continue to affect our results of operations and financial condition.

Fluctuations in Exchange Rates

Our consolidated financial statements are prepared from the local currency-denominated financial results, assets and liabilities of us and our subsidiaries around the world, which are then translated as necessary into Won. Accordingly, our consolidated financial results and assets and liabilities may be materially affected by fluctuations in exchange rates. A substantial portion of our revenue is denominated in currencies other than the Won, in particular the U.S. dollar, and our purchases of raw materials from overseas suppliers are denominated primarily in U.S. dollars and, to a lesser extent, Chinese Renminbi, Japanese Yen and Euros. To the extent that we incur costs in one currency and derive revenue in another currency, our results of operations may be affected by changes in the exchange rates between the two currencies. See "Risk Factors – Risks Relating to Our Business – Exchange rate fluctuations between the Won and major foreign currencies may adversely affect our financial results."

Although the impact of exchange rate fluctuations has in the past been partially mitigated by strategies to take advantage of natural hedges, our results of operations have historically been affected by exchange rate fluctuations, and there can be no assurance that such strategies will be effective in eliminating or reducing the adverse impact of such fluctuations in the future. Due to the larger positive effects of the depreciation of the Won, appreciation of the Won against major foreign currencies in the past generally has had a net negative impact on our results of operations. See "– Market Risks – Foreign Exchange Risk."

Critical Accounting Policies

We have prepared our consolidated financial statements in accordance with Korean IFRS. The preparation of our financial statements requires us to make difficult, complex and subjective judgments in making the appropriate estimates and assumptions that affect the amounts reported in our financial statements. These judgments are based on our historical experience, and while we believe our estimates and judgments are reasonable under the circumstances in which they were made, there can be no assurance that our judgments will prove to be correct or that actual results reported in future periods will not differ from our expectations reflected in our accounting treatment of certain items. For further information regarding our significant accounting policies, see Note 2.2 of the notes to our Consolidated Interim Financial Statements and Notes 2 and 4 of the notes to our 2021/2020 Financial Statements.

Recent Accounting Changes

For information regarding our recent adoption of new standards, interpretations and amendments to Korean IFRS, see Note 2.1 of the notes to our Consolidated Interim Financial Statements and Note 2.2 of the notes to our 2021/2020 Financial Statements.

Results of Operations – First Three Months of 2022 Compared to First Three Months of 2021

The following table presents our selected consolidated statements of profit or loss data and changes therein for the first three months of 2021 and the first three months of 2022.

	For the Three Months Ended March 31,		Changes 3M 2021 versus 3M 2022	
	2021	2022	Amount	%
	(In billions of Won)			
Revenue	₩ 9,645	₩11,608	₩ 1,963	20.4%
Cost of sales	(7,187)	(9,110)	(1,923)	26.8
Gross profit	2,458	2,498	40	1.6
Selling and administrative expenses	(1,049)	(1,473)	(424)	40.4
Operating profit	1,409	1,024	(385)	(27.3)
Finance income	158	196	38	24.1
Finance costs	(195)	(239)	(44)	22.6
Share of net profit of associates and joint ventures accounted for using the equity method	2	(7)	(9)	N.M.
Other non-operating income	316	287	(29)	(9.2)
Other non-operating expenses	(263)	(238)	25	(9.5)
Profit before income tax	1,428	1,024	(404)	(28.3)
Income tax expense	(384)	(254)	130	(33.9)
Profit from continuing operations	1,044	770	(274)	(26.2)
Profit (loss) from discontinued operations	₩ 327	₩ (1)	(328)	N.M.
Profit for the period	₩ 1,371	₩ 769	(602)	(43.9)

N.M. means not meaningful.

Revenue

The following table presents a breakdown of our revenue (excluding discontinued operations) by segment and changes therein for the first three months of 2021 and the first three months of 2022.

	For the Three Months Ended March 31,		Changes 3M 2021 versus 3M 2022	
	2021	2022	Amount	%
	(In billions of Won)			
Petrochemicals	₩ 4,299	₩ 5,817	₩ 1,518	35.3%
LG Energy Solution	4,213	4,339	126	3.0
Advanced materials	746	958	212	28.4
Life sciences	160	203	43	26.9
Common and others	226	292	66	29.2
Revenue	₩ 9,645	₩11,608	1,963	20.4

Our revenue increased by 20.4%, or Won 1,963 billion, from Won 9,645 billion in the three-month period ended March 31, 2021 to Won 11,608 billion in the three-month period ended March 31, 2022, primarily due to increases in revenue from the petrochemicals segment, advanced materials segment and LG Energy Solution. Specifically:

- Revenue from the petrochemicals segment increased by 35.3%, or Won 1,518 billion, from Won 4,299 billion in the three-month period ended March 31, 2021 to Won 5,817 billion in the three-month period ended March 31, 2022, mainly due to increases in revenue from the NCC and PO, acrylates and SAP and PVC and plasticizers divisions.

  - The increase in revenue from the NCC and PO division was mainly driven by an increase in the sales volume of such products, which was primarily attributable to our increased capacity to produce such products through the expansion of our LLDPE production facilities in April 2021, as well as a temporary shutdown of our NCC production facilities in January 2021 that was not repeated in the three-month period ended March 31, 2022. The effect of such increase was enhanced by an increase in the average selling prices of NCC and PO, which was mainly driven by higher oil prices following Russia's invasion of Ukraine.

  - The increase in revenue from the acrylates and SAP division was mainly driven by an increase in the average selling price of SAP, which was primarily attributable to higher oil prices following Russia's invasion of Ukraine. The effect of such increase was enhanced by an increase in the sales volume of such products, mainly due to a decrease in our production of raw materials for SAP due to a temporary shutdown of our NCC production facilities in January 2021 that was not repeated in the three-month period ended March 31, 2022, as well as increased demand following a recovery from the COVID-19 pandemic.

  - The increase in revenue from the PVC and plasticizers division was mainly driven by an increase in the average selling prices of such products, which was primarily attributable to higher oil prices following Russia's invasion of Ukraine. The effect of such increase was enhanced by an increase in the sales volume of such products, which was principally caused by increased demand following a recovery from the COVID-19 pandemic.

- Revenue from the advanced materials segment increased by 28.4%, or Won 212 billion, from Won 746 billion in the three-month period ended March 31, 2021 to Won 958 billion in the three-month period ended March 31, 2022, mainly due to an increase in revenue from the battery materials division. Such increase primarily reflected an increase in the sales volume of battery materials such as cathodes and separators. The effect of such increase was enhanced by an increase in the average selling prices of such products, which was principally caused by increases in the costs of raw materials.

- Revenue from LG Energy Solution increased by 3.0%, or Won 126 billion, from Won 4,213 billion in the three-month period ended March 31, 2021 to Won 4,339 billion in the three-month period ended March 31, 2022, principally due to an increase in revenue from the mobility and IT battery division. Such increase primarily reflected increased sales of pouch-type and cylindrical electric vehicle batteries.

Cost of Sales and Gross Profit

Our cost of sales increased by 26.8%, or Won 1,923 billion, from Won 7,187 billion in the three-month period ended March 31, 2021 to Won 9,110 billion in the three-month period ended March 31, 2022. The increase in cost of sales was primarily due to increased sales volumes of the petrochemicals segment in particular, which was enhanced by an increase in the market price of naphtha, which accounts for the largest portion of our raw materials requirements.

As a result of the factors described above, our gross profit increased by 1.6%, or Won 40 billion, from Won 2,458 billion in the three-month period ended March 31, 2021 to Won 2,498 billion in the three-month period ended March 31, 2022. Our gross profit as a percentage of total revenue (or gross margin) decreased from 25.5% in the three-month period ended March 31, 2021 to 21.5% in the three-month period ended March 31, 2022.

Selling and Administrative Expenses

The following table presents a breakdown of our selling and administrative expenses (excluding discontinued operations) and changes therein for the first three months of 2021 and the first three months of 2022.

	For the Three Months Ended March 31,		Changes 3M 2021 versus 3M 2022	
	2021	2022	Amount	%
	(In billions of Won)			
Wages and salaries	₩ 252	₩ 346	₩ 94	37.3%
Post-employment benefits	20	23	3	15.0
Employee benefits	54	64	10	18.5
Travel expense	7	12	5	71.4
Water and utilities	19	25	6	31.6
Packaging expense	1	2	1	100.0
Rental expenses	28	35	7	25.0
Commission expenses	172	206	34	19.8
Depreciation	55	71	16	29.1
Advertising expense	6	7	1	16.7
Freight expenses	209	447	238	113.9
Training expense	4	7	3	75.0
Amortization	38	51	13	34.2
Sample expense	3	5	2	66.7
Development costs	51	58	7	13.7
Others	130	114	(16)	(12.3)
Selling and administrative expenses	₩1,049	₩1,473	424	40.4

Our selling and administrative expenses increased by 40.4%, or Won 424 billion, from Won 1,049 billion in the three-month period ended March 31, 2021 to Won 1,473 billion in the three-month period ended March 31, 2022, primarily due to increases in freight expenses and wages and salaries. Specifically:

- Freight expenses increased by 113.9%, or Won 238 billion, from Won 209 billion in the three-month period ended March 31, 2021 to Won 447 billion in the three-month period ended March 31, 2022, primarily due to higher freight rates resulting from the post-pandemic recovery of freight traffic demand outpacing the supply of ships and shipping personnel.

- Wages and salaries increased by 37.3%, or Won 94 billion, from Won 252 billion in the three-month period ended March 31, 2021 to Won 346 billion in the three-month period ended March 31, 2022, principally as a result of an increase in salaries mainly attributable to an increase in the number of our employees as well as higher average wages paid to our employees.

Operating Profit

Primarily due to the factors described above, our operating profit (excluding discontinued operations) decreased by 27.3%, or Won 385 billion, from Won 1,409 billion in the three-month period ended March 31, 2021 to Won 1,024 billion in the three-month period ended March 31, 2022. Our operating profit as a percentage of total revenue (or operating margin) decreased from 14.6% in the three-month period ended March 31, 2021 to 8.8% in the three-month period ended March 31, 2022.

The following table presents a breakdown of our operating profit (loss) (excluding discontinued operations) by segment and changes therein for the three-month periods ended March 31, 2021 and 2022.

	For the Three Months Ended March 31,		Changes 3M 2021 versus 3M 2022	
	2021	2022	Amount	%
	(In billions of Won)			
Petrochemicals	₩ 984	₩ 635	₩(349)	(35.5)%
LG Energy Solution	341	259	(82)	(24.0)
Advanced materials	90	154	64	71.1
Life sciences	22	32	10	45.5
Common and others	(27)	(55)	(28)	103.7
Operating profit	₩1,409	₩1,024	(385)	(27.3)

The decrease in our operating profit in the three-month period ended March 31, 2021 compared to the three-month period ended March 31, 2022 was primarily attributable to decreases in operating profit from the petrochemicals segment and LG Energy Solution. Specifically:

- Operating profit from the petrochemicals segment decreased by 35.5%, or Won 349 billion, from Won 984 billion in the three-month period ended March 31, 2021 to Won 635 billion in the three-month period ended March 31, 2022, primarily due to the decreased profitability of the NCC division resulting from an increase in naphtha prices due to higher oil prices following Russia's invasion of Ukraine, increased supply from competitors and decreased demand due to China's COVID-19 lockdown, as well as a decrease in the sales of ABS and NBL.

- Operating profit from LG Energy Solution decreased by 24.0%, or Won 82 billion, from Won 341 billion in the three-month period ended March 31, 2021 to Won 259 billion in the three-month period ended March 31, 2022, principally as a result of increases in raw material expenses and other associated cost of sales and selling and administrative expenses, which more than offset increases in the average selling prices and sales volume of our products in this segment.

Finance Income and Finance Costs

The following table presents a breakdown of our finance income and finance costs (excluding discontinued operations) and changes therein for the first three months of 2021 and the first three months of 2022.

	For the Three Months Ended March 31,		Changes 3M 2020 versus 3M 2021	
	2021	2022	Amount	%
	(In billions of Won)			
Finance income				
Interest income	₩ 11	₩ 58	₩ 47	427.3%
Dividend income	0	0	0	0.0
Exchange differences	113	94	(19)	(16.8)
Gain on valuation of derivative instruments	23	43	20	87.0
Others	11	1	(10)	(90.9)
Finance income	₩158	₩196	38	24.1
Finance costs				
Interest expense	₩ 40	₩ 62	₩ 22	55.0%
Exchange differences	147	176	29	19.7
Loss related to derivative instruments	8	0	(8)	(100.0)
Others	0	1	1	N.A.
Finance costs	₩195	₩239	44	22.6

N.A. means not applicable.

Our finance income increased by 23.4%, or Won 37 billion, from Won 158 billion in the three-month period ended March 31, 2021 to Won 196 billion in the three-month period ended March 31, 2022, primarily due to a 427.3% increase in interest income from Won 11 billion in the three-month period ended March 31, 2021 to Won 58 billion in the three-month period ended March 31, 2022. Such increase in interest income mainly reflected higher interest income from deposits held at financial institutions due to the higher interest rate environment in Korea in the three-month period ended March 31, 2022 compared to the three-month period ended March 31, 2021.

Our finance costs increased by 22.6%, or Won 44 billion, from Won 195 billion in the three-month period ended March 31, 2021 to Won 239 billion in the three-month period ended March 31, 2022, primarily due to a 19.7% increase in exchange differences from Won 147 billion in the three-month period ended March 31, 2021 to Won 176 billion in the three-month period ended March 31, 2022 and a 55.0% increase in interest expense from Won 40 billion in the three-month period ended March 31, 2021 to Won 62 billion in the three-month period ended March 31, 2022. The increase in interest expense was primarily due to a decrease in capitalized interest for qualifying assets and an increase in interest paid on debentures due to an increase in the amount of debentures issued as well as the higher interest rate environment in Korea in the three-month period ended March 31, 2022 compared to the three-month period ended March 31, 2021.

On a net basis, net loss on exchange differences increased from Won 33 billion in the three-month period ended March 31, 2021 to Won 82 billion in the three-month period ended March 31, 2022, primarily due to higher exchange rate volatility in the three-month period ended March 31, 2022 compared to the three-month period ended March 31, 2021. In terms of the Market Average Exchange Rate, the Won depreciated from Won 1,088.0 to US$1.00 as of December 31, 2020 to Won 1,133.5 to US$1.00 as of March 31, 2021 and from Won 1,185.5 to US$1.00 as of December 31, 2021 to Won 1,210.8 to US$1.00 as of March 31, 2022.

In addition, on a net basis, net gain related to derivative instruments increased from Won 15 billion in the three-month period ended March 31, 2021 to Won 43 billion in the three-month period ended March 31, 2022, mainly as a result of an increase in net gain on the valuation of derivatives held by us and LG Energy Solution, which we entered into to hedge against foreign exchange risk associated with our and LG Energy Solution's foreign currency debt due to the depreciation of the Won as discussed above.

Other Non-operating Income and Expenses

The following table presents a breakdown of our other non-operating income and other non-operating expenses (excluding discontinued operations) and changes therein for the first three months of 2021 and the first three months of 2022.

	For the Three Months Ended March 31,		Changes 3M 2021 versus 3M 2022	
	2021	2022	Amount	%
	(In billions of Won)			
Other non-operating income				
Exchange differences	₩275	₩229	₩(46)	(16.7)%
Gain on disposal of property, plant and equipment	25	11	(14)	(56.0)
Gain on disposal of intangible assets	0	0	0	N.A.
Reversal of negative goodwill	–	33	33	N.A.
Insurance income	8	4	(4)	(50.0)
Others	8	9	1	12.5
Other non-operating income	₩316	₩287	(29)	(9.2)
Other non-operating expenses				
Exchange differences	₩236	₩195	₩(41)	(17.4)%
Loss on disposal of property, plant and equipment	9	15	6	66.7
Loss on disposal of intangible assets	0	20	20	N.A.
Impairment loss on property, plant and equipment	3	1	(2)	(66.7)
Impairment loss on intangible assets	0	0	0	N.A.
Donations	1	2	1	100.0
Others	14	6	(8)	(57.1)
Other non-operating expenses	₩263	₩238	(25)	(9.5)

N.A. means not applicable.

Our other non-operating income decreased by 9.2%, or Won 29 billion, from Won 316 billion in the three-month period ended March 31, 2021 to Won 287 billion in the three-month period ended March 31, 2022, primarily due to a 16.7% decrease in exchange differences from Won 275 billion in the three-month period ended March 31, 2021 to Won 229 billion in the three-month period ended March 31, 2022 and a 56.0% decrease in gain on disposal of property, plant and equipment from Won 25 billion in the three-month period ended March 31, 2021 to Won 11 billion in the three-month period ended March 31, 2022. Such decreases were partially offset by an increase in reversal of negative goodwill from nil in the three-month period ended March 31, 2021 to Won 33 billion in the three-month period ended March 31, 2022. The decrease in gain on disposal of property, plant and equipment mainly reflected gain recognized in connection with the disposal of our logistics center in Gimhae, Korea in the three-month period ended March 31, 2021 which was not repeated in the three-month period ended March 31, 2022. The increase in reversal of negative goodwill was attributable to the gain from a bargain purchase recognized in connection with our acquisition of LG Energy Solution Vertech Inc. in February 2022.

Our other non-operating expenses decreased by 9.5%, or Won 25 billion, from Won 263 billion in the three-month period ended March 31, 2021 to Won 238 billion in the three-month period ended March 31, 2022, primarily due to a 17.4%, or Won 41 billion, decrease in exchange differences from Won 236 billion in the three-month period ended March 31, 2021 to Won 195 billion in the three-month period ended March 31, 2022, which was partially offset by an increase in loss on disposal of intangible assets from Won 0 billion in the three-month period ended March 31, 2021 to Won 20 billion in the three-month period ended March 31, 2022. The increase in loss on disposal of intangible assets mainly reflected loss from our disposal of old software.

On a net basis, our net gain on exchange differences decreased 7.9%, or Won 3 billion, from Won 38 billion in the three-month period ended March 31, 2021 to Won 35 billion in the three-month period ended March 31, 2022, which was primarily attributable to a greater depreciation of the Won against the U.S. dollar in the three-month period ended March 31, 2021 compared to the depreciation of the Won against the U.S. dollar in the three-month period ended March 31, 2022.

Share of Net Profit (Loss) of Associates and Joint Ventures Accounted for Using the Equity Method

Our share of net profit (loss) of associates and joint ventures accounted for using the equity method changed from a net profit of Won 2 billion in the three-month period ended March 31, 2021 to a net loss of Won 7 billion in the three-month period ended March 31, 2022, primarily due to a change in share of profit (loss) related to HL Greenpower Co., Ltd. from a net profit to a net loss. See Note 10 of the notes to our Consolidated Interim Financial Statements.

Income Tax Expenses

Our income tax expense for continuing operations decreased by 33.9%, or Won 130 billion, from Won 384 billion in the three-month period ended March 31, 2021 to Won 254 billion in the three-month period ended March 31, 2022, mainly as a result of a decrease in profit before income tax from Won 1,428 billion in the three-month period ended March 31, 2021 to Won 1,024 billion in the three-month period ended March 31, 2022.

Profit (Loss) for the Period from Continuing and Discontinued Operations

Primarily due to the factors described above, our profit for the period from continuing operations decreased 26.2% from Won 1,044 billion in the three-month period ended March 31, 2021 to Won 770 billion in the three-month period ended March 31, 2022.

In March 2020, we substantially discontinued our glass substrate business, and in February 2021, we disposed of our LCD polarizer business. In July 2021, we disposed of all of our shares of Ugimag Korea Co., Ltd. Such businesses were presented as discontinued operations in our consolidated interim financial statements for the three-month period ended March 31, 2022, and our consolidated interim financial statements for the three-month period ended March 31, 2021 were recast to retrospectively reflect such presentation. See Note 34.2 of the notes to our Consolidated Interim Financial Statements included elsewhere in this offering circular. Our profit (loss) for the period from discontinued operations changed from a net profit of Won 327 billion in the three-month period ended March 31, 2021 to a net loss of Won 1 billion in the three-month period ended March 31, 2022.

Profit for the Period

Primarily due to the factors described above, our profit for the period decreased 43.9% from Won 1,371 billion in the three-month period ended March 31, 2021 to Won 769 billion in the three-month period ended March 31, 2022.

Results of Operations – 2020 Compared to 2021

The following table presents our selected consolidated statements of profit or loss data and changes therein for 2020 and 2021.

	For the Year Ended December 31,		Changes 2020 versus 2021	
	2020	2021	Amount	%
	(In billions of Won)			
Revenue	₩ 30,059	₩ 42,655	₩12,596	41.9%
Cost of sales	(23,741)	(31,436)	(7,695)	32.4
Gross profit	6,317	11,218	4,901	77.6
Selling and administrative expenses	(4,512)	(6,193)	(1,681)	37.3
Operating profit	1,805	5,025	3,220	178.4
Finance income	417	687	270	64.7
Finance costs	(1,109)	(661)	448	(40.4)
Share of net profit of associates and joint ventures accounted for using the equity method	9	(7)	(16)	N.A.
Other non-operating income	1,155	903	(252)	(21.8)
Other non-operating expenses	(1,327)	(1,057)	270	(20.3)
Profit before income tax	952	4,891	3,939	413.8
Income tax expense	(368)	(1,236)	(868)	235.9
Profit from continuing operations	584	3,655	3,071	525.9
Profit (loss) from discontinued operations	₩ 99	₩ 299	200	202.0
Profit for the year	₩ 682	₩ 3,954	3,272	479.8

N.A. means not applicable.

Revenue

The following table presents a breakdown of our revenue (excluding discontinued operations) by segment and changes therein for 2020 and 2021.

	For the Year Ended December 31,		Changes 2020 versus 2021	
	2020	2021	Amount	%
	(In billions of Won, except percentages)			
Petrochemicals	₩13,637	₩20,175	₩ 6,538	47.9%
LG Energy Solution[(1)]	12,364	17,804	5,440	44.0
Advanced materials	2,746	3,203	457	16.6
Life sciences	650	690	40	6.2
Common and others	663	782	119	17.9
Revenue	₩30,059	₩42,655	12,596	41.9

Note:

(1) Our energy solutions segment split off to form LG Energy Solution in December 2020.

Our revenue increased by 41.9%, or Won 12,596 billion, from Won 30,059 billion in 2020 to Won 42,655 billion in 2021, primarily due to increases in revenue from the petrochemicals segment and LG Energy Solution. Specifically:

- Revenue from the petrochemicals segment increased by 47.9%, or Won 6,538 billion, from Won 13,637 billion in 2020 to Won 20,175 billion in 2021, mainly due to increases in revenue from the PVC and plasticizers, ABS and NCC and PO divisions.

    - The increase in revenue from the PVC and plasticizers division was mainly driven by an increase in the average selling prices of such products, which was principally caused by increases in the market prices of the primary feedstock for such products. The effect of such increase was enhanced by an increase in the sales volume of such products, which was principally caused by increased demand following a recovery from the COVID-19 pandemic.

    - The increase in revenue from the ABS division was mainly driven by an increase in the average selling prices of such products, which was principally caused by increases in the market prices of the primary feedstocks for ABS products. The effect of such increase was enhanced by an increase in the sales volume of such products, which was principally caused by increased demand following a recovery from the COVID-19 pandemic.

    - The increase in revenue from the NCC and PO division was mainly driven by an increase in the average selling prices of such products, which was principally caused by an increase in the market price of naphtha, the primary feedstock for such products. The effect of such increase was enhanced by an increase in the sales volume of such products, which was principally caused by increased demand following a recovery from the COVID-19 pandemic as well as our increased capacity to produce such products through the expansion of our LLDPE production facilities in April 2021.

- Revenue from LG Energy Solution increased by 44.0%, or Won 5,440 billion, from Won 12,364 billion in 2020 to Won 17,804 billion in 2021, principally due to increases in revenues from the advanced automotive battery and mobility and IT battery divisions. Such increases primarily reflected increases in the sales volume of the products produced by such divisions, which was mainly driven by growth in demand for electric vehicles, among others, due to increased government subsidies pursuant to environment-friendly policies, particularly in Europe and the United States.

Cost of Sales and Gross Profit

Our cost of sales increased by 32.4%, or Won 7,695 billion, from Won 23,741 billion in 2020 to Won 31,436 billion in 2021. The increase in cost of sales was primarily due to increased raw material costs incurred by LG Energy Solution and the petrochemicals segment due to increased production and an increase in the market price of naphtha, respectively.

As a result of the factors described above, our gross profit increased by 77.6%, or Won 4,901 billion, from Won 6,317 billion in 2020 to Won 11,218 billion in 2021. Our gross profit as a percentage of total revenue (or gross margin) increased from 21.0% in 2020 to 26.3% in 2021.

Selling and Administrative Expenses

The following table presents a breakdown of our selling and administrative expenses (excluding discontinued operations) and changes therein for 2020 and 2021.

	For the Year Ended December 31,		Changes 2020 versus 2021	
	2020	2021	Amount	%
	(In billions of Won)			
Wages and salaries	₩ 942	₩1,234	₩ 292	31.0%
Post-employment benefits	75	84	9	12.0
Employee benefits	196	242	46	23.5
Travel expense	35	45	10	29.4
Water and utilities	56	69	13	23.2
Packaging expense	7	8	1	14.3
Rental expenses	88	125	37	42.1
Commission expenses	691	905	214	31.0
Depreciation	192	245	53	27.6
Advertising expense	27	39	12	44.4
Freight expenses	598	936	338	56.5
Training expense	16	28	12	75.0
Amortization	134	168	34	25.4
Sample expense	22	21	(1)	(4.5)
Development costs	218	255	37	17.0
Others	1,215	1,789	574	47.2
Selling and administrative expenses	₩4,512	₩6,193	1,681	37.3

Our selling and administrative expenses increased by 37.3%, or Won 1,681 billion, from Won 4,512 billion in 2020 to Won 6,193 billion in 2021, primarily due to an increase in miscellaneous other selling and administrative expenses, which was enhanced by increases in freight expenses, wages and salaries and commission expenses. Specifically:

- Miscellaneous other selling and administrative expenses increased by 47.2%, or Won 574 billion, from Won 1,215 billion in 2020 to Won 1,789 billion in 2021, mainly reflecting an increase in provisions relating to the replacement of the battery systems of certain electric vehicles that use our batteries. See "Risk Factors – Risks Relating to Our Business – Safety risks relating to rechargeable lithium ion batteries and negative publicity associated therewith may negatively impact our business."

- Freight expenses increased by 56.5%, or Won 338 billion, from Won 598 billion in 2020 to Won 936 billion in 2021, primarily due to an increase in freight rates as well as an increase in the sales volume of our products, particularly automotive batteries, which require higher freight expenses due to their weight and special shipping requirements.

- Wages and salaries increased by 31.0%, or Won 292 billion, from Won 942 billion in 2020 to Won 1,234 billion in 2021, principally as a result of an increase in salaries mainly attributable to an increase in the number of our employees as well as higher average wages paid to our employees.

- Commission expenses increased by 31.0%, or Won 214 billion, from Won 691 billion in the 2020 to Won 905 billion in 2021, principally as a result of an increase in shipping commissions paid.

Our selling and administrative expenses as a percentage of total revenue decreased from 15.0% in 2020 to 14.5% in 2021.

Operating Profit

Primarily due to the factors described above, our operating profit increased by 178.4%, or Won 3,220 billion, from Won 1,805 billion in 2020 to Won 5,025 billion in 2021. Our operating profit as a percentage of total revenue (or operating margin) increased from 6.0% in 2020 to 11.8% in 2021.

The following table presents a breakdown of our operating profit (loss) (excluding discontinued operations) by segment and changes therein for 2020 and 2021.

	For the Year Ended December 31,		Changes 2020 versus 2021	
	2020	2021	Amount	%
	(In billions of Won)			
Petrochemicals	₩1,936	₩4,081	₩2,145	110.8%
LG Energy Solution[(1)]	(166)	771	937	N.A.
Advanced materials	203	236	33	16.3
Life sciences	54	67	13	24.1
Common and others	(222)	(130)	92	(41.4)
Operating profit	₩1,805	₩5,025	3,220	178.4

N.A. means not applicable.

Note:

(1) Our energy solutions segment split off to form LG Energy Solution in December 2020.

The increase in our operating profit in 2021 compared to 2020 was primarily attributable to an increase in operating profit from the petrochemicals segment, as well as operating profit from LG Energy Solution in 2021 compared to operating loss in 2020. Specifically:

- Operating profit from the petrochemicals segment increased by 110.8%, or Won 2,145 billion, from Won 1,936 billion in 2020 to Won 4,081 billion in 2021, primarily due to increases in the average selling prices and sales volume of our products in this segment, which more than offset increases in raw material expenses and other associated costs of sales and selling and administrative expenses.

- We recorded operating profit of Won 771 billion from LG Energy Solution in 2021, compared to operating loss of Won 166 billion in 2020, principally as a result of increases in the sales volume of battery products across all divisions in this segment, as well as improved productivity and cost savings.

Finance Income and Finance Costs

The following table presents a breakdown of our finance income and finance costs (excluding discontinued operations) and changes therein for 2020 and 2021.

	For the Year Ended December 31,		Changes 2020 versus 2021	
	2020	2021	Amount	%
	(In billions of Won)			
Finance income				
Interest income	₩ 36	₩ 76	₩ 40	111.1%
Dividend income	0	7	7	N.A.
Exchange differences	377	368	(9)	(2.4)
Gain related to derivative instruments	–	203	203	N.A.
Others	4	32	28	700.0
Finance income	₩ 417	₩687	270	64.7
Finance costs				
Interest expense	₩ 198	₩211	₩ 13	6.6%
Exchange differences	585	441	(144)	(24.6)
Loss related to derivative instruments	325	8	(317)	(97.5)
Others	–	0	0	N.A.
Finance costs	₩1,109	₩661	(448)	(40.4)

N.A. means not applicable.

Our finance income increased by 64.7%, or Won 270 billion, from Won 417 billion in 2020 to Won 687 billion in 2021, primarily due to a Won 203 billion increase in gain related to derivative instruments from nil in 2020 to Won 203 billion in 2021, which was enhanced by a 111.1%, or Won 40 billion, increase in interest income from Won 36 billion in 2020 to Won 76 billion in 2021.

Our finance costs decreased by 40.4%, or Won 448 billion, from Won 1,109 billion in 2020 to Won 661 billion in 2021, primarily due to a 97.5%, or Won 317 billion, decrease in loss related to derivative instruments from Won 325 billion in 2020 to Won 8 billion in 2021, and a 24.6%, or Won 144 billion, decrease in exchange differences from Won 585 billion in 2020 to Won 441 billion in 2021.

On a net basis, net loss on exchange differences decreased from Won 208 billion in 2020 to Won 73 billion in 2021, primarily due to the depreciation of the Won against the U.S. dollar in 2021, compared to the appreciation of the Won against the U.S. dollar in 2020. In terms of the Market Average Exchange Rate, the Won appreciated from Won 1,157.8 to U.S.$1.00 as of December 31, 2019 to Won 1,088.0 to U.S.$1.00 as of December 31, 2020 but depreciated to Won 1,185.5 to U.S.$1.00 as of December 31, 2021.

In addition, on a net basis, we recorded a net gain related to derivative instruments of Won 195 billion in 2021, compared to a net loss related to derivative instruments of Won 325 billion in 2020, mainly as a result of an increase in net gain on the valuation of derivatives held by us and LG Energy Solution, which we entered into to hedge against foreign currency risks associated with our and LG Energy Solution's foreign currency debt, due to the depreciation of the Won in 2021 compared to the appreciation of the Won in 2020 as discussed above.

Other Non-operating Income and Expenses

The following table presents a breakdown of our other non-operating income and other non-operating expenses (excluding discontinued operations) and changes therein for 2020 and 2021.

	For the Year Ended December 31,		Changes 2020 versus 2021	
	2020	2021	Amount	%
	(In billions of Won)			
Other non-operating income				
Exchange differences	₩ 762	₩ 699	₩ (63)	(8.3)%
Gain on disposal of property, plant and equipment	3	36	33	N.M.
Gain on disposal of intangible assets	0	5	5	N.A.
Gain on disposal of investments in associates	312	8	(304)	(97.4)
Insurance income	9	63	54	600.0
Others	68	92	24	35.3
Other non-operating income	₩1,155	₩ 903	(252)	(21.8)
Other non-operating expenses				
Exchange differences	₩ 925	₩ 584	₩(341)	(36.9)%
Loss on disposal of property, plant and equipment	81	65	(16)	(19.8)
Loss on disposal of intangible assets	2	2	(0)	0.0
Loss on disposal of investments in associates	–	2	2	N.A.
Impairment loss on property, plant and equipment	74	29	(45)	(60.8)
Impairment loss on intangible assets	138	299	161	116.7
Donations	14	17	3	21.4
Others	93	58	(35)	(37.6)
Other non-operating expenses	₩1,327	₩1,057	(270)	(20.3)

N.A. means not applicable.
N.M. means not meaningful.

Our other non-operating income decreased by 21.8%, or Won 252 billion, from Won 1,155 billion in 2020 to Won 903 billion in 2021, primarily due to a 97.4%, or Won 304 billion, decrease in gain on disposal of investments in associates from Won 312 billion in 2020 to Won 8 billion in 2021, which was enhanced by an 8.3%, or Won 63 billion, decrease in exchange differences from Won 762 billion in 2020 to Won 699 billion in 2021. The decrease in gain on disposal of investments in associates was mainly attributable to a significant gain recognized in connection with the disposal of LG Holdings (HK) Ltd. in 2020 which was not repeated in 2021.

Our other non-operating expenses decreased by 20.3%, or Won 270 billion, from Won 1,327 billion in 2020 to Won 1,057 billion in 2021, primarily due to a 36.9%, or Won 341 billion, decrease in exchange differences from Won 925 billion in 2020 to Won 584 billion in 2021. Such decrease was offset in part by a 116.7%, or Won 161 billion, increase in impairment loss on intangible assets from Won 138 billion in 2020 to Won 299 billion in 2021. The increase in impairment loss on intangible assets was primarily attributable to impairment loss on goodwill of Won 295 billion recognized in connection with LG Life Sciences, Ltd. in 2021.

On a net basis, we recorded a net gain on exchange differences of Won 115 billion in 2021, compared to a net loss of Won 163 billion in 2020, which was primarily attributable to the depreciation of the Won against the U.S. dollar in 2021, compared to the appreciation of the Won against the U.S. dollar in 2020, as discussed above.

Share of Net Profit of Associates and Joint Ventures Accounted for Using the Equity Method

We recorded a loss from our share of net profit of associates and joint ventures accounted for using the equity method of Won 7 billion in 2021 primarily due to our share of loss of PT.HLI Green Power, compared to a gain from our share of net profit of associates and joint ventures accounted for using the equity method of Won 9 billion in 2020, primarily due to our share of profit of SEETEC Co., Ltd. See Note 10 of the notes to our 2021/2020 Financial Statements.

Income Tax Expenses

Our income tax expense for continuing operations increased by 235.9%, or Won 868 billion, from Won 368 billion in 2020 to Won 1,236 billion in 2021, primarily due to an increase in profit before income tax for continuing operations from Won 952 billion in 2020 to Won 4,891 billion in 2021. Our effective tax rate for continuing operations was 38.65% and 25.27% in 2020 and 2021, respectively. See Note 28 of the notes to our 2021/2020 Financial Statements.

Profit (Loss) for the Year from Continuing and Discontinued Operations

Primarily due to the factors described above, our profit for the year from continuing operations increased by 525.9%, or Won 3,071 billion, from Won 584 billion in 2020 to Won 3,655 billion in 2021.

In March 2020, we substantially discontinued our glass substrate business, and in February 2021, we disposed of our LCD polarizer business. In July 2021, we disposed of all of our shares of Ugimag Korea Co., Ltd. Such businesses were presented as discontinued operations in our consolidated financial statements for 2021, and comparative consolidated financial statements for 2020 were recast to retrospectively reflect such presentation. See Note 34.2 of the notes to our 2021/2020 Financial Statements included elsewhere in this offering circular. Our profit for the year from discontinued operations increased by 202.0%, or Won 200 billion, from Won 99 billion in 2020 to Won 299 billion in 2021.

Profit for the Year

Primarily due to the factors described above, our profit for the year increased by 479.8%, or Won 3,272 billion, from Won 682 billion in 2020 to Won 3,954 billion in 2021. Our profit for the year as a percentage of total revenue (or net margin) increased from 2.3% in 2020 to 9.3% in 2021.

Results of Operations – 2019 Compared to 2020

The following table presents our selected consolidated statements of profit or loss data and changes therein for 2019 and 2020.

	For the Year Ended December 31,		Changes 2019 versus 2020	
	2019	2020	Amount	%
	(In billions of Won)			
Revenue	₩ 27,353	₩ 30,059	₩ 2,706	9.9%
Cost of sales	(22,667)	(23,741)	(1,074)	4.7
Gross profit	4,686	6,317	1,631	34.8
Selling and administrative expenses	(3,860)	(4,512)	(652)	16.9
Operating profit	825	1,805	980	118.8
Finance income	286	417	131	45.8
Finance costs	(421)	(1,109)	(688)	163.4
Share of net profit of associates and joint ventures accounted for using the equity method	22	9	(13)	(59.1)

	For the Year Ended December 31,		Changes 2019 versus 2020	
	2019	2020	Amount	%
	(In billions of Won)			
Other non-operating income	519	1,155	636	122.5
Other non-operating expenses	(657)	(1,327)	(670)	102.0
Profit before income tax	574	952	378	65.9
Income tax expense	(169)	(368)	(199)	117.8
Profit from continuing operations	405	584	179	44.2
Profit (loss) from discontinued operations	(29)	99	128	N.A.
Profit for the year	₩ 376	₩ 682	306	81.4

N.A. means not applicable.

Revenue

The following table presents a breakdown of our revenue (excluding discontinued operations) by segment and changes therein for 2019 and 2020.

	For the Year Ended December 31,		Changes 2019 versus 2020	
	2019	2020	Amount	%
	(In billions of Won)			
Petrochemicals	₩14,993	₩13,637	₩(1,356)	(9.0)%
Energy solutions[(1)]	8,350	12,364	4,014	48.1
Advanced materials	2,625	2,746	121	4.6
Life sciences	622	650	28	4.5
Common and others	763	663	(100)	(13.1)
Revenue	₩27,353	₩30,059	2,706	9.9

Note:

(1) Our energy solutions segment split off to form LG Energy Solution in December 2020.

Our revenue increased by 9.9%, or Won 2,706 billion, from Won 27,353 billion in 2019 to Won 30,059 billion in 2020, primarily due to an increase in revenue from the energy solutions segment, which was offset in part by a decrease in revenue from the petrochemicals segment. Specifically:

- Revenue from the energy solutions segment increased by 48.1%, or Won 4,014 billion, from Won 8,350 billion in 2019 to Won 12,364 billion in 2020, principally due to an increase in revenue from the advanced automotive battery division. Such increase primarily reflected an increase in the sales volume of such products, which was mainly driven by growth in demand for electric vehicles, among others, due to an increase in government subsidies pursuant to environment-friendly policies, particularly in Europe and the United States.

- Revenue from the petrochemicals segment decreased by 9.0%, or Won 1,356 billion, from Won 14,993 billion in 2019 to Won 13,637 billion in 2020, mainly due to decreases in revenue from the NCC and PO, ABS, high performance materials ("HPM") and PVC and plasticizers divisions.

- The decrease in revenue from the NCC and PO divisions was mainly driven by a decrease in the sales volume of such products, which was primarily attributable to decreased demand resulting from the COVID-19 pandemic, across Asian countries in particular. The effect of such decrease was enhanced by a decrease in the average selling prices of such products, which was principally caused by a decrease in the market price of naphtha, the primary feedstock for such products.

- The decrease in revenue from the ABS division primarily reflected a decrease in the sales volume of such products, which was mainly driven by decreased demand resulting from the COVID-19 pandemic, particularly in India. The effect of such decrease was partially offset by an increase in the average selling prices of ABS products, principally reflecting an increase in the market prices of the primary feedstocks for ABS products.

- The decrease in revenue from the HPM division primarily reflected a decrease in the sales volume of such products, which was mainly driven by decreased demand resulting from the COVID-19 pandemic, across Asian countries in particular. The effect of such decrease was enhanced by a decrease in the average selling price of styrene-butadiene rubber ("SBR"), which was principally attributable to a decrease in the market price of its primary feedstock, butadiene.

- The decrease in revenue from the PVC and plasticizers division was mainly due to a decrease in the sales volume of such products, which was primarily driven by decreased demand resulting from the COVID-19 pandemic, particularly in China and India. The effect of such decrease was offset in part by an increase in the average selling prices of such products, mainly as a result of a decrease in the export volume of such products by companies in the United States, which led to an increase in the market prices of such products.

Cost of Sales and Gross Profit

Our cost of sales increased by 4.7%, or Won 1,074 billion, from Won 22,667 billion in 2019 to Won 23,741 billion in 2020. The increase in cost of sales was primarily due to an increase in such costs incurred by the energy solutions segment, in particular, relating to the volume of raw materials and consumables used, mainly reflecting the overall growth in the sales volume of such products as discussed above as well as increased costs in connection with the operations of our expanded production facilities, including those of our energy solutions segment, and depreciation relating thereto. Such increase was partially offset by a decrease in the market price of naphtha, which accounts for the largest portion of our raw material requirements, as well as other feedstocks and raw materials.

As a result of the factors described above, our gross profit increased by 34.8%, or Won 1,631 billion, from Won 4,686 billion in 2019 to Won 6,317 billion in 2020. Our gross profit as a percentage of total revenue (or gross margin) increased from 17.1% in 2019 to 21.0% in 2020.

Selling and Administrative Expenses

The following table presents a breakdown of our selling and administrative expenses (excluding discontinued operations) and changes therein for 2019 and 2020.

	For the Year Ended December 31,		Changes 2019 versus 2020	
	2019	2020	Amount	%
	(In billions of Won)			
Wages and salaries	₩ 857	₩ 942	₩ 85	9.9%
Post-employment benefits	58	75	17	29.3
Employee benefits	188	196	8	4.3
Travel expense	79	34	(45)	(57.0)
Water and utilities	55	56	1	1.8
Packaging expense	11	7	(4)	(36.4)
Rental expenses	95	88	(7)	(7.4)
Commission expenses	555	691	136	24.5
Depreciation	154	192	38	24.7
Advertising expense	38	27	(11)	(28.9)
Freight expenses	568	598	30	5.3
Training expense	25	16	(9)	(36.0)
Amortization	106	134	28	26.4
Sample expense	23	21	(2)	(8.7)
Development costs	236	218	(18)	(7.6)
Others	812	1,215	403	49.6
Selling and administrative expenses	₩3,860	₩4,512	652	16.9

Our selling and administrative expenses increased by 16.9%, or Won 652 billion, from Won 3,860 billion in 2019 to Won 4,512 billion in 2020, primarily due to an increase in miscellaneous other selling and administrative expenses, which was enhanced by increases in commission expenses and wages and salaries. Specifically:

- Other selling and administrative expenses increased by 49.6%, or Won 403 billion, from Won 812 billion in 2019 to Won 1,215 billion in 2020, mainly reflecting an increase in provisions relating to the replacement of the battery systems of certain electric vehicles that use our batteries. See "Risk Factors – Risks Relating to Our Business – Safety risks relating to rechargeable lithium ion batteries and negative publicity associated therewith may negatively impact our business."

- Commission expenses increased by 24.5%, or Won 136 billion, from Won 555 billion in 2019 to Won 691 billion in 2020, primarily due to an increase in legal fees relating to lawsuits.

- Wages and salaries increased by 9.9%, or Won 85 billion, from Won 857 billion in the 2019 to Won 942 billion in 2020, principally as a result of an increase in salaries mainly attributable to higher average wages paid to our employees.

Our selling and administrative expenses as a percentage of total revenue increased from 14.1% in 2019 to 15.0% in 2020.

Operating Profit

Primarily due to the factors described above, our operating profit increased by 118.8%, or Won 980 billion, from Won 825 billion in 2019 to Won 1,805 billion in 2020. Our operating profit as a percentage of total revenue (or operating margin) increased from 3.0% in 2019 to 6.0% in 2020.

The following table presents a breakdown of our operating profit (loss) (excluding discontinued operations) by segment and changes therein for 2019 and 2020.

	For the Year Ended December 31,		Changes 2019 versus 2020	
	2019	2020	Amount	%
	(In billions of Won)			
Petrochemicals	₩1,418	₩1,936	₩518	36.5%
Energy solutions[(1)]	(454)	(166)	288	(63.4)
Advanced materials	14	203	189	N.M.
Life sciences	37	54	17	45.9
Common and others	(190)	(222)	(32)	16.8
Operating profit	₩ 825	₩1,805	980	118.8

N.M. means not meaningful.

Note:

(1) Our energy solutions segment split off to form LG Energy Solution in December 2020.

The increase in our operating profit in 2020 compared to 2019 was primarily attributable to increases in operating profit from the petrochemicals and advanced materials segments and a decrease in operating loss from the energy solutions segment. Specifically:

- Operating profit from the petrochemicals segment increased by 36.5%, or Won 518 billion, from Won 1,418 billion in 2019 to Won 1,936 billion in 2020, primarily due to overall decreases in raw material expenses, which more than offset decreases in the sales volumes and average selling prices of our products in this segment and increases in other associated costs of sales and selling and administrative expenses.

- Operating loss from the energy solutions segment decreased by 63.4%, or Won 288 billion, from Won 454 billion in 2019 to Won 166 billion in 2020, principally as a result of increases in the sales volume of battery products across all divisions in this segment, as well as improved productivity and cost savings.

- Operating profit from the advanced materials segment increased significantly from Won 14 billion in 2019 to Won 203 billion in 2020, mainly reflecting increases in the sales volumes of cathode and OLED materials, as well as improved productivity and cost savings from the sale of the LCD polarizer business.

Finance Income and Finance Costs

The following table presents a breakdown of our finance income and finance costs (excluding discontinued operations) and changes therein for 2019 and 2020.

	For the Year Ended December 31,		Changes 2019 versus 2020	
	2019	2020	Amount	%
	(In billions of Won)			
Finance income				
Interest income	₩ 49	₩ 36	₩(13)	(26.5)%
Dividend income	2	0	(2)	(100.0)
Exchange differences	206	377	171	83.0
Gain on valuation of derivative instruments	30	–	(30)	(100.0)
Others	0	4	4	N.A.
Finance income	₩286	₩ 417	131	45.8
Finance costs				
Interest expense	₩203	₩ 198	₩ (5)	(2.5)%
Exchange differences	218	585	367	168.3
Loss related to derivative instruments	0	325	325	N.A.
Others	0	–	0	N.A.
Finance costs	₩421	₩1,109	688	163.4%

N.A. means not applicable.

Our finance income increased by 45.8%, or Won 131 billion, from Won 286 billion in 2019 to Won 417 billion in 2020, primarily due to an 83.0%, or Won 171 billion, increase in exchange differences from Won 206 billion in 2019 to Won 377 billion in 2020, which was partially offset by a 100.0%, or Won 30 billion, decrease in gain on valuation of derivative instruments from Won 30 billion in 2019 to nil in 2020.

Our finance costs increased by 163.4%, or Won 688 billion, from Won 421 billion in 2019 to Won 1,109 billion in 2020, primarily due to a 168.3%, or Won 367 billion, increase in exchange differences from Won 218 billion in 2019 to Won 585 billion in 2020, and a significant increase in loss related to derivative instruments from Won 0 billion in 2019 to Won 325 billion in 2020.

On a net basis, net loss on exchange differences increased significantly from Won 12 billion in 2019 to Won 208 billion in 2020, primarily due to the appreciation of the Won against the U.S. dollar in 2020, compared to the depreciation of the Won against the U.S. dollar in 2019. In terms of the Market Average Exchange Rate, the Won depreciated from Won 1,118.1 to U.S.$1.00 as of December 31, 2018 to Won 1,157.8 to U.S.$1.00 as of December 31, 2019 and appreciated to Won 1,088.0 to U.S.$1.00 as of December 31, 2020.

In addition, on a net basis, we recorded a net loss related to derivative instruments of Won 325 billion in 2020, compared to a net gain of Won 29 billion in 2019, mainly as a result of an increase in the valuation of our exchangeable bonds due to a significant increase in our stock price in 2020 compared to 2019.

Other Non-operating Income and Expenses

The following table presents a breakdown of our other non-operating income and other non-operating expenses (excluding discontinued operations) and changes therein for 2019 and 2020.

	For the Year Ended December 31,		Changes 2019 versus 2020	
	2019	2020	Amount	%
	(In billions of Won)			
Other non-operating income				
Exchange differences	₩469	₩ 762	₩293	62.5%
Gain on disposal of property, plant and equipment	10	3	(7)	(70.0)
Gain on disposal of intangible assets	0	0	0	N.A.
Reversal of impairment loss on property, plant and equipment	0	–	0	N.A.
Gain on disposal of investments in associates	1	312	311	N.M.
Insurance income	–	9	9	N.A.
Others	39	68	29	74.4
Other non-operating income	₩519	₩1,155	636	122.5
Other non-operating expenses				
Exchange differences	₩455	₩ 925	₩470	103.3%
Loss on disposal of property, plant and equipment	43	81	38	88.4
Loss on disposal of intangible assets	1	2	1	100.0
Impairment loss on property, plant and equipment	58	74	16	27.6
Impairment loss on intangible assets	61	138	77	126.2
Donations	15	14	(1)	(6.7)
Others	24	93	69	287.5
Other non-operating expenses	₩657	₩1,327	670	102.0

N.A. means not applicable.
N.M. means not meaningful.

Our other non-operating income increased by 122.5%, or Won 636 billion, from Won 519 billion in 2019 to Won 1,155 billion in 2020, primarily due to a significant increase in gain on disposal of investments in associates and a 62.5%, or Won 293 billion, increase in exchange differences from Won 469 billion in 2019 to Won 762 billion in 2020. The increase in gain on disposal of investments in associates was mainly attributable to gains recognized in connection with the disposal of LG Holdings (HK) Ltd.

Our other non-operating expenses increased by 102.0%, or Won 670 billion, from Won 657 billion in 2019 to Won 1,327 billion in 2020, primarily due to a 103.3%, or Won 470 billion, increase in exchange differences from Won 455 billion in 2019 to Won 925 billion in 2020, which was enhanced by a 126.2%, or Won 77 billion, increase in impairment loss on intangible assets from Won 61 billion in 2019 to Won 138 billion in 2020 and a 287.5%, or Won 69 billion, increase in other miscellaneous non-operating expenses from Won 24 billion in 2019 to Won 93 billion in 2020. The increase in impairment loss on intangible assets was primarily attributable to impairment loss on goodwill recognized in connection with FarmHannong and Uniseal, Inc. in 2020, and the increase in other miscellaneous non-operating expenses was mainly attributable to losses incurred from shutdowns of overseas production facilities as a result of the COVID-19 pandemic as well as increased provisions established in connection with LG Polymers' vapor leak accident.

On a net basis, we recorded a net loss on exchange differences of Won 163 billion in 2020, compared to a net gain of Won 13 billion in 2019, which was primarily attributable to the appreciation of the Won against the U.S. dollar in 2020, compared to the depreciation of the Won against the U.S. dollar in 2019, as discussed above.

Share of Net Profit of Associates and Joint Ventures Accounted for Using the Equity Method

Our share of net profit of associates and joint ventures accounted for using the equity method decreased by 59.1%, or Won 13 billion, from Won 22 billion in 2019 to Won 9 billion in 2020, primarily due to decrease in our shares of profit related to TECHWIN Co., Ltd., LG Holdings (HK) Ltd. and HL Greenpower Co., Ltd. See Note 10 of the notes to our 2020/2019 Financial Statements.

Income Tax Expenses

Our income tax expense for continuing operations increased by 117.8%, or Won 199 billion, from Won 169 billion in 2019 to Won 368 billion in 2020, primarily due to an increase in profit before income tax for continuing operations from Won 574 billion in 2019 to Won 952 billion in 2020. Our effective tax rate for continuing operations was 29.44% and 38.65% in 2019 and 2020, respectively. See Note 28 of the notes to our 2020/2019 Financial Statements.

Profit (Loss) for the Year from Continuing and Discontinued Operations

Primarily due to the factors described above, our profit for the year from continuing operations increased by 44.2%, or Won 179 billion, from Won 405 billion in 2019 to Won 584 billion in 2020.

In March 2020, we substantially discontinued our glass substrate business, and in February 2021, we disposed of our LCD polarizer business. Such businesses were presented as discontinued operations in our consolidated financial statements for 2020, and comparative consolidated financial statements for 2019 were recast to retrospectively reflect such presentation. See Note 34.2 of the notes to our 2020/2019 Financial Statements included elsewhere in this offering circular. Our profit (loss) for the year from discontinued operations changed from a net loss of Won 29 billion in 2019 to a net profit of Won 99 billion in 2020. See "– Results of Operations – 2020 Compared to 2021 – Profit (Loss) for the Year from Continuing and Discontinued Operations."

Profit for the Year

Primarily due to the factors described above, our profit for the year increased by 81.4%, or Won 306 billion, from Won 376 billion in 2019 to Won 682 billion in 2020. Our profit for the year as a percentage of total revenue (or net margin) increased from 1.4% in 2019 to 2.3% in 2020.

Liquidity and Capital Resources

Liquidity

Our principal sources of liquidity have historically been:

- cash generated by our operations, principally from sales of products; and
- proceeds from issuances of debentures as well as short-term and long-term borrowings.

Our principal cash requirements or uses have historically been:

- cash required for our operations, including purchases of raw materials, employee costs, freight costs and research and development expenses;
- capital expenditures for property, plant and equipment;
- interest and principal payments on our debentures and short-term and long-term borrowings;
- investments involving acquisitions, including shares of our affiliates, and strategic joint ventures;

- payments of income tax; and

- payments of cash dividends to our shareholders.

We had net working capital (defined as current assets minus current liabilities) of Won 2,928 billion as of December 31, 2019, Won 3,695 billion as of December 31, 2020, Won 5,352 billion as of December 31, 2021 and Won 15,799 billion as of March 31, 2022. Our holdings of cash and cash equivalents were Won 1,889 billion as of December 31, 2019, Won 3,274 billion as of December 31, 2020, Won 3,761 billion as of December 31, 2021 and Won 9,052 billion as of March 31, 2022. We manage our liquidity risk to maintain adequate net working capital by continuously monitoring projected cash flows. We also aim to mitigate liquidity risk by contracting with financial institutions with respect to bank overdrafts and banking facility agreements in order to ensure the availability of sufficient funds. We believe that cash from our operations, current and future financing arrangements (including issuances of debentures and short-term and long-term borrowing facilities) and existing cash and cash equivalents are likely to be sufficient to satisfy our operating cash requirements, capital expenditure needs and debt service requirements for the foreseeable future.

We strive to maintain a sound capital structure, and we monitor capital on the basis of our liabilities-to-equity ratio, which is calculated as total liabilities divided by total equity. The following table sets forth our liabilities-to-equity ratios as of the dates indicated.

	As of December 31,			As of March 31,
	2019	2020	2021	2022
	(In billions of Won, except percentages)			
Total liabilities	₩16,641	₩22,598	₩27,925	₩28,926
Total equity	17,384	18,790	23,210	35,491
Liabilities-to-equity ratio	95.7%	120.3%	120.3%	81.5%

Cash Flows

The following table sets forth our cash flows for the periods indicated.

	For the Years Ended December 31,			For the Three Months Ended March 31,	
	2019	2020	2021	2021	2022
	(In billions of Won)				
Net cash inflow from operating activities	₩ 3,121	₩ 5,841	₩ 5,510	₩1,066	₩ 156
Net cash outflow from investing activities	(6,111)	(5,296)	(5,349)	(38)	(7,264)
Net cash inflow from financing activities	2,301	938	124	688	12,337
Cash and cash equivalents at the end of the year in the consolidated statement of financial position	1,889	3,274	3,761	5,058	9,052
Net increase (decrease) in cash and cash equivalents	(690)	1,483	284	1,716	5,229

Cash Flows from Operating Activities

Our net cash inflow from operating activities decreased from Won 1,066 billion in the three-month period ended March 31, 2021 to Won 156 billion in the three-month period ended March 31, 2022. This change was primarily attributable to the decrease in profit before income tax (including discontinued operations) from Won 1,848 billion in the three-month period ended March 31, 2021 to Won 1,023 billion in the three-month period ended March 31, 2022, as well as an increase in inventories, the effects of which were offset in part by an increase in trade payables.

Our net cash inflow from operating activities decreased from Won 5,841 billion in 2020 to Won 5,510 billion in 2021. This decrease was primarily attributable to an increase in inventories. The effect of such increase was offset in part by the increase in profit before income tax (including discontinued operations) from Won 1,107 billion in 2020 to Won 5,267 billion in 2021. In addition, our profit before income tax in 2021 reflected higher non-cash items such as depreciation, provisions and impairment losses compared to 2020.

Our net cash inflow from operating activities increased from Won 3,121 billion in 2019 to Won 5,841 billion in 2020. This increase was primarily attributable to the increase in profit before income tax (including discontinued operations) from Won 561 billion in 2019 to Won 1,107 billion in 2020, which reflected improved operating results in 2020 compared to 2019. A decrease in cash collected from customers was mostly offset by a decrease in cash paid to suppliers.

Cash Flows from Investing Activities

Our net cash outflow from investing activities increased from Won 38 billion in the three-month period ended March 31, 2021 to Won 7,264 billion in the three-month period ended March 31, 2022. This increase was primarily attributable to an increase in cash outflows related to net decrease in other receivables of Won 393 billion in the three-month period ended March 31, 2021 compared to net increase in other receivables of Won 5,032 billion in the three-month period ended March 31, 2022, mainly reflecting the portion of our proceeds from the sale of our shares during the initial public offering of LG Energy Solution in January 2022 that we deposited at financial institutions, and an increase in cash outflows from acquisitions of property, plant and equipment from Won 1,179 billion in the three-month period ended March 31, 2021 to Won 2,182 billion in the three-month period ended March 31, 2022, mainly reflecting the installment of new equipment by LG Energy Solution and us.

Our net cash outflow from investing activities increased slightly from Won 5,296 billion in 2020 to Won 5,349 billion in 2021. This increase was primarily attributable to an increase in cash outflows from acquisitions of property, plant and equipment from Won 5,536 billion in 2020 to Won 5,774 billion in 2021, mainly for investments by LG Energy Solution into Ultium Cells, a joint venture between LG Energy Solution and GM.

Our net cash outflow from investing activities decreased from Won 6,111 billion in 2019 to Won 5,296 billion in 2020. This decrease was primarily attributable to a decrease in cash used for acquisition of property, plant and equipment from Won 6,238 billion in 2019 to Won 5,536 billion in 2020, mainly reflecting the conclusion of several expansion projects of our production facilities in 2019, including the expansion of other petrochemical facilities at our Yeosu Complex and the expansion of mobile battery production facilities in China.

Cash Flows from Financing Activities

Our net cash inflow from financing activities increased from Won 688 billion in the three-month period ended March 31, 2021 to Won 12,337 billion in the three-month period ended March 31, 2022. Such increase was primarily attributable to a significant increase in capital contribution from non-controlling interests from Won 110 billion in the three-month period ended March 31, 2021 to Won 12,854 billion in the three-month period ended March 31, 2022 due primarily to the initial public offering of LG Energy Solution.

Our net cash inflow from financing activities decreased from Won 938 billion in 2020 to Won 124 billion in 2021. This decrease was primarily attributable to an increase in repayments of borrowings and others from Won 3,195 billion in 2020 to Won 5,106 billion in 2021, mainly reflecting our repayments of our credit card balances. Such increase was offset in significant part by an increase in proceeds from borrowings from Won 4,074 billion in 2020 to Won 5,661 billion in 2021, primarily reflecting our issuance of US$1 billion in green bonds.

Our net cash inflow from financing activities decreased from Won 2,301 billion in 2019 to Won 938 billion in 2020. This decrease was primarily attributable to an increase in repayments of borrowings and others from Won 1,301 billion in 2019 to Won 3,195 billion in 2020, mainly reflecting our repayments of US$626 million in borrowings in China and €291 million and US$220 million in convertible bonds.

Borrowings, Debentures and Guarantees

As of March 31, 2022, we had short-term borrowings of Won 1,707 billion, which consisted of borrowings in Won. In addition, Won 1,479 billion of long-term borrowings and Won 1,109 billion of debentures as of March 31, 2022 were scheduled to become due on or prior to March 31, 2023.

As of March 31, 2022, we had outstanding debentures, net of current portion and present value discounts, of Won 6,760 billion, which consisted of debentures in Won of Won 3,683 billion and debentures in foreign currencies of Won 3,077 billion.

As of March 31, 2022, we had long-term borrowings, net of current portion, of Won 3,313 billion, which consisted of borrowings in Won of Won 450 billion and borrowings in foreign currencies of Won 2,863 billion.

The maturities of our long-term borrowings and debentures, net of current portion, that were outstanding as of March 31, 2022 are as follows.

For the Year Ended December 31,	Long-Term Borrowings and Debentures in Won	Long-Term Borrowings and Debentures in Foreign Currencies	Total
		(In billions of Won)	
2023	₩ –	₩1,032	₩ 1,032
2024	1,139	1,775	2,914
2025	549	698	1,247
2026	469	1,087	1,556
Thereafter	2,026	1,298	3,324
Total	₩4,183	₩5,890	₩10,073

We believe that we have various options to meet our financing needs, including issuances of debentures and short-term and long-term borrowing facilities. As of March 31, 2022, we maintained aggregate bank credit commitments of Won 15,109 billion, of which Won 12,495 billion remained unutilized. However, our ability to continue to obtain debt financing at a reasonable cost will depend on several factors, some of which may be outside our control, including general economic conditions, the liquidity of the Korean and international capital markets and the Government's policies regarding Won and foreign currency debt. These policies can affect our ability to borrow and gain access to domestic and foreign capital markets or restrict the use of proceeds of any financing, and can require us to incur indebtedness from other sources that entail higher interest rates or shorter maturities.

Capital Expenditures

We make substantial capital expenditures annually to support our business goals and objectives, and we plan to continue to invest in enhancing and expanding our production facilities and upgrading our equipment and manufacturing processes. Our total capital expenditures (consisting of cash used in the acquisition of property, plant and equipment) amounted to Won 6,238 billion in 2019, Won 5,536 billion in 2020, Won 5,774 billion in 2021, Won 1,179 billion for the three months ended March 31, 2021 and Won 2,182 billion for the three months ended March 31, 2022, and we plan to spend approximately Won 9 trillion in 2022 (including amounts already expended in the three months ended March 31, 2022), principally for the construction of separator production facilities in Hungary, the construction of POE and PBAT facilities in Daesan, the expansion of NBL facilities in Malaysia and the expansion of cathode materials production facilities in Gumi. See "Business – Production Facilities."

Market Risks

Market risk is the risk of loss related to adverse changes in market prices, including foreign exchange risk, interest rate risk and equity price risk. Our overall risk management program focuses on fluctuations in the financial markets and seeks to minimize potential adverse effects of such fluctuations on our financial performance.

Our finance team actively monitors and manages market risks under policies approved by our management. The finance team seeks to identify, evaluate and hedge financial risks in close cooperation with our operating units. Our management reviews and approves principles for overall risk management and policies covering foreign exchange risk, interest rate risk and credit risk.

Foreign Exchange Risk

We are exposed to foreign exchange risk arising from various currency exposures, including those relating to commercial transactions and assets and liabilities denominated in currencies other than the Won. Revenue and expenses arise from foreign currency transactions and exchange positions, and our most widely used foreign currencies are U.S. dollars, Euros, Japanese Yen and Chinese Renminbi. In order to minimize foreign exchange risk arising from operating activities, our management's policies require us and our subsidiaries to manage our foreign exchange risk against our respective functional currencies. We manage our foreign exchange risk exposures by utilizing currency risk management models and employees who are responsible for such foreign exchange risk management. For example, we strive to naturally offset foreign exchange risk by matching our foreign currency receivables with our foreign currency payables. We have investments in foreign operations, whose net assets are exposed to foreign currency translation risk, and we manage such currency exposure primarily through borrowings denominated in the relevant foreign currencies.

The following table sets forth our exposure to foreign exchange risk from our holdings of monetary assets and liabilities denominated in foreign currencies as of March 31, 2022.

	As of March 31, 2022			
	U.S. Dollar	Euro	Yen	Renminbi and Others
	(In billions of Won)			
Monetary assets	₩5,714	₩ 365	₩ 9	₩328
Monetary liabilities	6,596	4,904	202	4

The estimated impact on our profit before income tax for the periods indicated, from our holdings of monetary assets and liabilities denominated in foreign currencies as of the end of such respective periods, of 10% changes in Won to U.S. dollar and Won to Euro exchange rates, assuming that all other variables remain constant and ignoring any impact on forecasted sales and purchases, is as follows.

	For the Year Ended December 31,						For the Three Months Ended March 31,	
	2019		2020		2021		2022	
	10% Increase	10% Decrease	10% Increase	10% Decrease	10% Increase	10% Decrease	10% Increase	10% Decrease
	(In billions of Won)							
USD	₩ (64)	₩ 64	₩ 77	₩(77)	₩ 32	₩(32)	₩ (40)	₩ 40
EUR	₩(288)	₩288	₩(416)	₩416	₩(413)	₩413	₩(417)	₩417

Interest Rate Risk

Interest rate risk is defined as the risk that the interest income or expense arising from deposits and borrowings will fluctuate because of changes in future market interest rates. We are exposed to interest rate risk arising principally through financial liabilities and assets that bear floating interest rates. Our interest rate risk exposure is mainly related to our long-term borrowings from banks, as well as our interest-bearing deposits. The objective of interest rate risk management is to minimize financial losses and uncertainties associated with interest rate fluctuations, and we strive to manage our interest rate risk through continuous monitoring of changes in market interest rates and responding to imbalances on a timely basis.

If interest rates on our floating rate borrowings and deposits had been 1% higher or lower with all other variables held constant, the estimated impact on our profit after income tax for the periods indicated would have been as follows.

	For the Year Ended December 31,						For the Three Months Ended March 31,	
	2019		2020		2021		2022	
	1% Increase	1% Decrease	1% Increase	1% Decrease	1% Increase	1% Decrease	1% Increase	1% Decrease
	(In billions of Won)							
Impact on profit after tax.....	₩(22)	₩22	₩(37)	₩37	₩(39)	₩39	₩(42)	₩42

Equity Price Risk

Our investment portfolio includes direct and indirect investments in equity securities listed on the KRX KOSPI Market, the KRX KOSDAQ Market and certain other stock exchanges. We are exposed to equity price risk arising from fluctuations in the market value of such financial investments. Our management assesses such market price risk on a regular basis, and significant investments are individually managed while significant purchase and sale decisions are approved by our board of directors.

Overview

We are a leading global chemical company and the largest chemical company in Korea in terms of revenue. We manufacture and sell domestically and overseas a broad range of upstream and downstream petrochemical products, as well as rechargeable batteries and core materials used in the IT and automobile industries, among others. In addition, we are engaged in the manufacture and sale of pharmaceuticals, vaccines, diagnostic kits and fine chemicals. Specifically, our business comprises the following five segments:

- ***Petrochemicals.*** The petrochemicals segment, which is our largest business segment, manufactures and sells petrochemical products, including basic materials produced at our NCCs and synthetic resins and other products manufactured by processing such basic materials.

- ***LG Energy Solution.*** Our subsidiary LG Energy Solution, which comprises our energy solutions segment, manufactures and sells rechargeable lithium ion batteries used in mobile devices and electric vehicles, as well as ESS batteries for renewable energy. LG Energy Solution was established in December 2020 through a split-off of our energy solutions segment.

- ***Advanced materials.*** The advanced materials segment manufactures and sells core materials for advanced products such as batteries, displays, semiconductors, automotive parts and water treatment filters.

- ***Life sciences.*** The life sciences segment manufactures and sells a variety of pharmaceuticals, vaccines, diagnostic kits and fine chemicals for primary and specialty care as well as aesthetics.

- ***Common and others.*** The common and others segment includes operations relating to crop protection products and fertilizers conducted through our wholly-owned subsidiary FarmHannong, as well as supporting divisions, including general management, sales and research and development.

Our overall business objective is to maintain and enhance our position as a leading global chemical company with a diversified product portfolio that also encompasses energy solutions, advanced materials and life sciences products. Historically, our main products in terms of revenue have included a variety of synthetic resins such as ABS, PVC and PE, although sales of our rechargeable batteries have been increasing significantly in recent years. We derive significant benefits from the diversification of our businesses and vertical integration of our petrochemical operations. For example, we produce basic materials for petrochemical products at our NCCs, such as ethylene and propylene, which are further processed into synthetic resins and other products, such as PO, PVC and plasticizers, ABS, EP, acrylates and SAP and rubber and specialty polymers. We believe that such vertical integration, which ensures a stable source of raw materials and demand for many of our products, as well as the diversified nature of our business mitigate the effects on our results of operations and financial condition of cyclical fluctuations, especially in the petrochemical industry.

We have established an extensive global network of production facilities located in key strategic locations. We currently operate 19 domestic production facilities located throughout Korea, and we operate production facilities outside Korea through 29 overseas manufacturing subsidiaries located across 18 countries, including China, Taiwan, India, Vietnam, the United States and Poland. In response to evolving market demand and in order to maintain the competitiveness of our products as well as diversify our product portfolio, we plan to continue to invest in expanding and upgrading our production capacity.

Our revenue (excluding discontinued operations) amounted to Won 27,353 billion in 2019, Won 30,059 billion in 2020, Won 42,655 billion in 2021, Won 9,645 billion for the three months ended March 31, 2021 and Won 11,608 billion for the three months ended March 31, 2022. We recorded profit (excluding discontinued operations) of Won 405 billion in 2019, Won 584 billion in 2020, Won 3,655 billion in 2021, Won 1,044 billion for the three months ended March 31, 2021 and Won 770 billion for the three months ended March 31, 2022. We had total assets of Won 64,417 billion and total equity of Won 35,491 billion as of March 31, 2022.

History

Our business originated from Lucky Chemical Co., Ltd., which was established on January 5, 1947 and initially engaged in the production of cosmetics, plastic goods and household products. In 1974, Lucky Chemical Co., Ltd. changed its name to Lucky Corporation and during the mid-1970s expanded further upstream into the petrochemicals sector, taking advantage of Government policies to promote the development of the domestic petrochemicals industry. In 1991, three affiliates of Lucky Corporation, Lucky Pharmaceuticals Corp., Lucky Advanced Materials Inc. and Lucky Polychemical Co., Ltd., were merged into Lucky Corporation to further expand the petrochemicals and specialty chemicals businesses. In 1995, Lucky Corporation was renamed LG Chemical, Ltd., and in 2001, we were spun off from LG Chemical, Ltd., which was renamed as LG Chem Investment Ltd., to form LG Chem Ltd. In 2003, LG Chem Investment Ltd. merged with LG Electronics Investment Ltd. to become LG Corp., our largest shareholder, which owned approximately 33.3% of our outstanding common shares as of March 31, 2022.

In 2009, we spun off our former industrial materials segment to a new affiliate, LG Hausys, Ltd. In April 2016, we acquired FarmHannong, which conducts operations relating to crop protection products and fertilizers. In January 2017, we merged with a former affiliate, LG Life Sciences, Ltd., which added the life sciences segment to our business. In December 2020, in order to more effectively respond to the increasing demand for rechargeable lithium ion batteries in the automotive and IT industries, we established LG Energy Solution as a subsidiary through a split-off of our energy solutions segment. See "– Our Business Segments and Products – Energy Solutions."

We are a member of the LG Group, which was the fourth largest business group in Korea in terms of combined assets as of December 31, 2021, according to the Korea Fair Trade Commission. Our registered office is at 128, Yeoui-daero, Yeongdeungpo-gu, Seoul 07336, Korea.

Our Business Segments and Products

The following table sets forth a breakdown of our revenue (excluding discontinued operations) by business segment for the periods indicated.

	For the Year Ended December 31,						For the Three Months Ended March 31,			
	2019		2020		2021		2021		2022	
	(in billions of Won, except percentages)									
Business segment:										
Petrochemicals	₩14,993	54.8%	₩13,637	45.4%	₩20,175	47.3%	₩4,299	44.5%	₩ 5,817	50.1%
LG Energy Solution[(1)]	8,350	30.5	12,364	41.1	17,804	41.7	4,213	43.7	4,339	37.4
Advanced materials	2,625	9.6	2,746	9.1	3,203	7.5	746	7.7	958	8.3
Life sciences	622	2.3	650	2.2	690	1.6	160	1.7	203	1.7
Common and others	763	2.8	663	2.2	782	1.8	226	2.3	292	2.5
Total revenue	₩27,353	100.0%	₩30,059	100.0%	₩42,655	100.0%	₩9,645	100.0%	₩11,608	100.0%

Note:

(1) Our energy solutions segment split off to form LG Energy Solution in December 2020.

The following table sets forth a breakdown of our operating profit (loss) (excluding discontinued operations) by business segment for the periods indicated.

	For the Year Ended December 31,						For the Three Months Ended March 31,			
	2019		2020		2021		2021		2022	
	(in billions of Won, except percentages)									
Business segment:										
Petrochemicals	₩1,418	171.8%	₩1,936	107.3%	₩4,081	81.2%	₩ 984	69.8%	₩ 635	62.0%
LG Energy Solution[(1)]	(454)	(55.0)	(166)	(9.2)	771	15.3	341	24.2	259	25.3
Advanced materials	14	1.8	203	10.8	236	4.7	90	6.4	154	15.0
Life sciences	37	4.5	54	3.0	67	1.3	22	1.6	32	3.1
Common and others	(190)	(23.0)	(222)	(11.9)	(130)	(2.6)	(27)	(1.9)	(55)	(5.4)
Total operating profit (loss)	₩ 825	100.0%	₩1,805	100.0%	₩5,025	100.0%	₩1,409	100.0%	₩1,024	100.0%

Note:

(1) Our energy solutions segment split off to form LG Energy Solution in December 2020.

Petrochemicals

The petrochemicals segment produces petrochemical products consisting of basic materials produced at our NCCs ("NCC products") and synthetic resins and other products manufactured by processing such NCC products, both for internal use and for sale in the domestic and overseas markets. We are currently the largest producer of NCC products in Korea, in terms of production volume, and one of the leading producers of such products in the world. Our domestic production facilities for petrochemicals segment products are located at our Yeosu and Daesan Complexes as well as our Naju, Iksan and Gimcheon Plants, while our overseas production facilities for such products are located in China, Vietnam and India. See "– Production Facilities."

The petrochemicals segment is organized into six divisions as follows:

- NCC
- PO
- PVC and plasticizers
- ABS
- Acrylates and SAP
- High performance materials ("HPM")
- Carbon nanotubes ("CNT")

NCC

Our NCCs produce basic petrochemicals, which are utilized as raw materials for a wide range of petrochemical intermediates for further downstream processing and blending as well as for a variety of finished goods, including plastics and fibers. Our main NCC products include ethylene, propylene, butadiene, benzene, toluene and xylene, methyl tert-butyl ether, butene-1, styrene monomer ("SM"), ethylene oxide, ethylene glycol and bisphenol-A ("BPA") and are produced by processing naphtha, a feedstock derived from crude oil, at high temperatures at our NCCs. Our NCCs are located in our Yeosu and Daesan Complexes. See "– Production Facilities."

We use a substantial amount of our NCC products internally as feedstock to produce synthetic resins and other products, while also selling a portion to downstream manufacturers, mainly in Korea.

PO

POs are synthetic resins that are produced by the polymerization of basic petrochemicals, including our NCC products. Our main PO products include PE, polyolefin elastomer ("POE"), polypropylene ("PP") and ethylene vinyl acetate ("EVA") and are generally used by downstream manufacturers to produce plastic containers, films, pipes, packaging materials and automotive parts.

In 2021 and the three months ended March 31, 2022, a majority of the division's revenue was generated from sales in overseas markets, mainly in China.

PVC and Plasticizers

The PVC and plasticizers division produces synthetic resins and other products including PVC, plasticizers such as dioctyl phthalate and caustic soda. PVC is used by downstream manufacturers to produce PVC sheets, pipes, films, synthetic fabric and other intermediate plastic products, which have a variety of uses in the construction, interior decorating and packaging industries. Plasticizers are added to PVC to produce flexible plastic products such as plastic flooring, wallpaper and artificial leather. Caustic soda is used for various purposes, including textile dyeing and soap manufacturing.

Major customers of the division's products include LG Hausys and KCC Corporation. In 2021 and the three months ended March 31, 2022, a majority of the division's revenue was attributable to domestic sales.

ABS

ABS is a synthetic resin made by polymerizing styrene and acrylonitrile in the presence of polybutadiene and is a highly functional plastic known for its strong heat and impact resistance and processability. Other products manufactured by the ABS division include other widely-used plastics such as acrylonitrile styrene acrylate, styrene acrylonitrile resin and polystyrene, as well as expandable polystyrene, better known as Styrofoam. Such products have a broad range of uses, particularly in producing automotive parts, toys, home appliances, product containers and building insulators.

Major customers of the division's products include LG Electronics, Hyundai Motor Company and Kia Corporation. While a substantial amount of the division's revenue was attributable to domestic sales in 2021 and the three months ended March 31, 2022, a significant portion of the division's revenue was generated from sales in overseas markets, mainly in China.

Acrylates and SAP

The acrylates and SAP division produces acrylic acid, isopropyl alcohol ("IPA") and neopentyl glycol ("NPG"), which are intermediate petrochemicals produced from propylene supplied from the NCC and PO products division, and SAP, which is able to absorb amounts of water amounting to several hundred times its weight. Acrylic acid and IPA are used in the production of solvents, paints and adhesives, while NPG is used in the production of powder coatings and resin. SAP is used in sanitary items such as diapers and pads.

Major customers of the division's products include Kimberly-Clark, Procter & Gamble and Sumitomo Seika Polymers. In 2021 and the three months ended March 31, 2022, a majority of the division's revenue was generated from sales in overseas markets, mainly in Europe, the Americas and China.

HPM

The high performance materials division produces synthetic rubber, methacrylate butadiene styrene ("MBS"), styrene butadiene styrene ("SBS") and nitrile butadiene rubber latex ("NBL"). Synthetic rubber has high elasticity and strength and is used mainly in tires, shoes, golf balls and industrial goods. MBS is a thermoplastic resin that is used mainly for PVC impact strength reinforcement or as a processing aid, and synthetic latex is used as an adhesive for paper coating or for rubber products such as medical gloves. SBS is made from styrene and butadiene ("BD") and used as a plastic or asphalt modifying agent or in adhesives. NBL is made of synthetic rubber using butadiene as its main ingredient and is widely used in medical and laboratory gloves.

Major customers of the division's products include Hankook Tire, Kumho Tire, Nexen Tire and Bridgestone Corporation. In 2021 and the three months ended March 31, 2022, a substantial majority of the division's revenue was generated from sales in overseas markets, mainly in Southeast Asia, China and the Americas.

CNT

CNTs are micro-cylindrical allotropes of carbon with unique electrical, thermal and mechanical properties. They are mainly used as electroconductive product materials, antistatic plastics for exterior auto parts and conductive agents for lithium-ion batteries.

LG Energy Solution is a major customer of the division's products. In 2021 and the three months ended March 31, 2022, a majority of the division's revenue was generated from sales in overseas markets, mainly in Europe and China.

LG Energy Solution

In December 2020, we split off our energy solutions segment and established LG Energy Solution as a subsidiary. Under the Korean Commercial Code, we are jointly and severally liable for all liabilities of LG Energy Solution that existed prior to the corporate split-off unless such joint and several liabilities have been successfully eliminated through creditor protection procedures of the relevant debt, including receiving the consent of such creditors or provision of sufficient security to the dissenting creditors. We remain jointly and severally liable for all liabilities of LG Energy Solution that existed prior to December 1, 2020, the record date of the Split-off, and currently remain outstanding. See "Risk Factors – Risks Relating to Our Business – LG Energy Solution and we remain jointly and severally liable for each other's liabilities that were incurred prior to the split-off of LG Energy Solution."

LG Energy Solution engages in the production of rechargeable lithium ion batteries used in mobile devices, such as phones and laptop computers, and electric vehicles, as well as ESS battery systems for renewable energy, for sale in the domestic and overseas markets. Its domestic production facilities for energy solutions segment products are located at our Ochang Plant, while its overseas production facilities for such products are located in China, the United States and Poland. See "– Production Facilities."

Lithium ion batteries are rechargeable with high energy density. Such batteries have become the standard batteries for mobile devices, such as mobile phones, tablets and laptop computers, and they are growing in importance for use in electric vehicles and power tools (such as cordless screwdrivers).

ESS batteries store electric energy for later consumption, improving energy efficiency and sustainability as well as the stability of power supply systems. For example, an ESS battery can store surplus energy generated from photovoltaic panels to be used at a later time as an alternative to the electrical grid. ESS batteries offer users flexibility in the way that they generate and use energy and are considered to be an important component for harnessing renewable energy sources.

LG Energy Solution is organized into three divisions as follows:

- Advanced automotive battery
- ESS battery
- Mobility and IT battery

Advanced Automotive Battery

The advanced automotive battery division has a product portfolio for a broad range of environmentally-friendly vehicles, including hybrid, plug-in hybrid and electric vehicles. LG Energy Solution is among the world's leading suppliers of automotive batteries. The automotive battery market has been expanding at a rapid pace due to the strengthening of fuel efficiency standards in many countries, major advances in the electric vehicle technology and the increasing cost-competitiveness of electric vehicles compared to traditional internal combustion engine vehicles, and we expect demand for automotive batteries to continue to grow in the future.

Major customers of the advanced automotive battery division include GM, Hyundai Motor Company and Stellantis. In 2021 and the three months ended March 31, 2022, a significant majority of the division's revenue was generated from sales in overseas markets.

ESS Battery

The ESS battery division produces battery cells, modules and packs that can be used for many different purposes, including electrical grids, households, commercial use and uninterrupted power systems. We believe that global demand for ESS batteries has strong growth potential, as many countries continue to develop policies to promote the development of renewable energy sources and strengthen energy efficiency standards.

Major customers of the ESS battery division include KEPCO and various large-scale utility companies, system integrators and ESS developers overseas. In 2021 and the three months ended March 31, 2022, a majority of the division's revenue was generated from sales in overseas markets, mainly in the United States and Europe.

Mobility and IT Battery

The mobility and IT battery division produces cylindrical and pouch-type rechargeable lithium ion batteries used in mobile devices, electric tools, electric bicycles, wearable devices and electric vehicles. We were the first domestic producer of lithium ion batteries, and LG Energy Solution is currently one of the world's major battery suppliers for mobile devices and electric vehicles.

Major customers of the mobility and IT battery division include LG Electronics, Lenovo and Samsung Electronics. In 2021 and the three months ended March 31, 2022, a significant majority of the division's revenue was generated from sales in overseas markets, mainly in the United States, Europe and China.

Advanced Materials

The advanced materials segment engages in the production of core materials for a broad array of advanced products such as batteries, displays, semiconductors, automotive parts and water treatment filters, both for internal use and for sale in the domestic and overseas markets.

Our domestic production facilities for advanced materials segment products are located at our Cheongju Complex and our Ochang and Iksan Plants, while our overseas production facilities for such products are located in China, Poland and Vietnam. See "– Production Facilities."

The advanced materials segment is organized into five divisions as follows:

- Battery materials
- Engineering materials
- IT materials
- Semiconductor materials
- Water solutions

A portion of the products produced by the advanced materials segment is supplied to other segments (including LG Energy Solution) for use as raw materials.

Battery Materials

The battery materials division mainly produces cathode materials that are incorporated into lithium ion batteries used in electric vehicles, mobile devices and ESS devices.

Major customers of the division's products include LG Energy Solution.

Engineering Materials

The engineering materials division produces engineering plastic compounds ("EPC"), thermoplastic elastomers and other specialty compounds, which are generally lighter but stronger than general plastics. Such products can be molded to be used as interior and exterior parts for automobiles as well as engine parts.

Major customers of the division's products include Hyundai Motor Company, Kia Corporation and LG Electronics.

IT Materials

The IT materials division produces OLED materials, display materials and advanced functional film that are used in OLED display materials. We produce the core organic materials for OLED, including hole injection layers, hole transfer layers, emission layers and electron transfer layers.

Major customers of the division's products include LG Display, Samsung Display and BOE Display.

Semiconductor Materials

The semiconductor materials division produces key materials for semiconductor substrates and processing. Semiconductor substrate materials, such as copper clad laminate ("CCL"), pre-preg and resin coated copper, are used in personal computer server DRAM, mobile DRAM, NAND, graphic DRAM and SiP chips, while semiconductor processing materials, such as die attach films and backside grinding tape, are used in personal computer server DRAM, graphic DRAM, mobile DRAM, NAND and AP chips and fingerprint sensors.

Major customers of the division's products include Samsung Electronics and SK Hynix.

Water solutions

The water solutions division produces reverse osmosis ("RO") membranes that are widely used in applications ranging from seawater desalination to waste water reuse. The thin-film membranes act as a filter to remove contaminants and purify water. In 2015, we opened a new fully-integrated membrane factory in our Cheongju Complex in anticipation of continued growth in demand for water treatment facilities.

Major customers of the division's products include Metito, GS Inima, Acciona and Veolia.

Life Sciences

The life sciences segment, which was added in January 2017 through the merger of an affiliate, LG Life Sciences, Ltd., with and into us, engages in the production of pharmaceuticals, vaccines, diagnostic kits and fine chemicals, for sale in the domestic and overseas markets. We believe that we derive significant benefits from the diversification of our business to include life sciences products, which we believe are generally less sensitive to cyclical changes in domestic and global economic conditions and present significant growth opportunities.

Our production facilities for life sciences segment products are located at our Osong, Iksan and Onsan Plants in Korea. See "– Production Facilities."

The life sciences segment is organized into three divisions as follows:

- Primary Care
- Specialty Care
- Aesthetics

Primary Care

The primary care division developed the first diabetes medicine in Korea, Zemiglo, as well as Synovian, an injectable arthritis medication, and Eucept, a medication for autoimmune disease. We also cooperate with other companies through partnerships, including in the areas of diabetes and cardiovascular, musculoskeletal and autoimmune diseases.

Specialty Care

The specialty care division developed the first growth hormone for children in Korea and concentrates on the research and development of drugs for special diseases. Its core products include Eutropin, an injectable growth hormone, Follitrope, an injection for ovulation induction, Euvax, a hepatitis B vaccine, Eupenta, a pentavalent combination vaccine, and Eupolio, a polio vaccine. Among these, Euvax, Eupenta and Eupolio have been approved by the World Health Organization.

Aesthetics

The aesthetics division develops and sells injectable hyaluronic fillers, including the Y-Solution and Yvoire brands.

Common and Others

The common and others segment mainly includes operations relating to crop protection products, fertilizers and seeds conducted through our wholly-owned subsidiary FarmHannong, which was acquired in April 2016, and supporting divisions, including general management, sales and research and development.

Sales and Distribution

We sell our products in both the domestic and overseas markets, which accounted for 23.8% and 76.2%, respectively, of our revenue in 2021 and 24.3% and 75.7%, respectively, of our revenue in the three months ended March 31, 2022. Our domestic sales are predominantly denominated in Won, while our overseas sales are generally denominated in U.S. dollars. The following table sets forth our external sales (excluding discontinued operations) by geographical location for the periods indicated.

	For the Year Ended December 31,						For the Three Months Ended March 31,			
	2019		2020		2021		2021		2022	
	(in billions of Won, except percentages)									
Geographical segment:										
Korea[(1)]	₩ 8,430	30.8%	₩ 8,270	27.5%	₩10,164	23.8%	₩2,160	22.4%	₩ 2,816	24.3%
China	8,320	30.4	8,913	29.7	12,131	28.5	2,647	27.4	3,610	31.1
Asia (excluding China)	3,739	13.7	3,283	10.9	5,178	12.1	1,222	12.7	1,467	12.6
Americas	1,871	6.8	2,601	8.7	4,310	10.1	992	10.3	1,062	9.1
Europe	4,583	16.8	6,663	22.2	10,351	24.3	2,531	26.2	2,514	21.7
Others	409	1.5	328	1.0	520	1.2	93	1.0	138	1.2
Total	₩27,353	100.0%	₩30,059	100.0%	₩42,655	100.0%	₩9,645	100.0%	₩11,608	100.0%

(1) Domestic sales include exports made through local letters of credit.

Domestic Sales

In Korea, we sell our petrochemicals, energy solutions and advanced materials segment products primarily to downstream manufacturers in a variety of industries, including the plastic goods, packaging, construction, furniture, automobile, electronics, paint, textile, footwear and rubber industries, which use such products as raw materials, additives or components in manufacturing end-use goods or in construction. No single customer or group of related customers accounts for a material portion of the aggregate domestic sales of any of our business segments.

Our domestic sales of intermediate products to downstream manufacturers are generally made pursuant to one-year or one-quarter term contracts which are automatically renewable each year or quarter unless terminated. Such contracts generally provide for the supply of fixed product quantity on a periodic basis, at prices that are adjusted at monthly or quarterly intervals based on prevailing market prices. We believe that due to the long-standing nature of the relationships between us and the majority of our manufacturing and construction company customers, the competitiveness of our intermediate products in the domestic and international markets and the high freight costs associated with importing such products from overseas, such companies are likely to continue their direct purchases of raw materials and components from us in the foreseeable future.

Sales in Korea of our life sciences segment products and crop protection products in the common and others segment are made to consumers primarily though our domestic sales and distribution offices in Korea, which, in turn, oversee the distribution of our products to local distributors and retail outlets.

For domestic sales, our credit policy typically requires payment within 30 to 200 days for products, following the end of the month in which the sale occurred. We manage our accounts receivable and credit exposure to domestic customers by establishing credit limits for each customer in accordance with internal credit guidelines. We consider each customer's creditworthiness, current and potential contribution to our overall sales, industry leadership and product technology as well as other quantitative and qualitative criteria to determine individual credit limits. In recent years, we have not experienced any material problems relating to customer payments.

Overseas Sales

Our overseas sales primarily consist of sales of our petrochemicals, energy solutions and advanced materials segment products to downstream manufacturers outside Korea mainly in the automobile and electronics industries, which use such intermediate products as raw materials, additives or components in manufacturing end-use goods. Our main overseas markets are China and other Asian countries, which accounted for 28.5% and 12.1%, respectively, of our total sales in 2021 and 31.1% and 12.6%, respectively, of our total sales in the three months ended March 31, 2022. China is one of the largest markets for petrochemical-based products, rechargeable batteries and advanced materials globally, and we have established local production facilities and marketing subsidiaries to increase efficiency in serving the market. Sales outside Korea are generally arranged through our 19 overseas marketing subsidiaries and six overseas representative offices, which are located in 17 countries throughout the world. No single customer or group of related customers' accounts for a material portion of the aggregate overseas sales of any of our business segments.

Our overseas sales of intermediate products to downstream manufacturers are generally made pursuant to one-year or multi-year term contracts which are automatically renewable after each term unless terminated. Such contracts generally provide for the supply of fixed product quantity on a periodic basis, at prices that are adjusted at quarterly or yearly intervals based on prevailing market prices. For overseas sales, our credit policy typically requires payment within 30 to 200 days for products, following the end of the month in which the sale occurred. Our process of managing our accounts receivable and credit exposure to overseas customers is similar to that for domestic customers, and, in recent years, we have not experienced any material problems relating to customer payments.

Production Facilities

We have established a network of production facilities in strategic locations around the world in order to better serve our major geographic markets and target customers. We currently operate 19 domestic production facilities located throughout Korea, including the Yeosu and Daesan Complexes in Korea where our NCCs are located. We also operate production facilities outside Korea through 29 overseas manufacturing subsidiaries located across 18 countries, including China, Taiwan, India, Vietnam, the United States and Poland.

The following table sets forth information regarding our production facilities.

Production Facility	Primary Products	Year Established
Petrochemicals:		
Domestic		
Yeosu	NCC products, SM, low density polyethylene ("LDPE"), high density polyethylene ("HDPE"), linear LDPE, PVC, vinyl chloride monomer ("VCM"), ABS, styrene acrylonitrile ("SAN"), expandable polystyrene, PC, acrylates, IPA, oxo alcohols, NPG, SAP, SBS, MBS, nitrile butadiene latex, BPA	1976
Naju	Octanol, butanol, plasticizers, acrylic acid	1984
Daesan	NCC products, ethylene oxide and ethylene glycol, SM, BD, methyl tertiary butyl ether, B-1, BPA, LDPE, PE, PP, POE, EVA, synthetic rubber, PVC, VCM	2003
Gimcheon	SAP	2008
Overseas		
China		
Tianjin	VCM, PVC, ethylene dichloride ("EDC"), SBS	2005
Ningbo	ABS, SAN	1995
Huizhou	ABS	2011

Production Facility	Primary Products	Year Established
Visakhapatnam, India	Polystyrene, expandable polystyrene	1996
Vietnam		
Ho Chi Minh	Dioctyl phthalate, diisononyl phthalate ("DINP")	1995
LG Energy Solution:		
Domestic		
Ochang	Mobile batteries, automotive batteries, ESS batteries	2004
Overseas		
Nanjing, China	Lithium ion batteries, automotive batteries	2003
Michigan, United States	Lithium ion batteries, battery packs	2012
Wroclaw, Poland	Automotive batteries	2016
Advanced materials:		
Domestic		
Cheongju	Protecting film, indium tin oxide film, A-film, CCL, 2CCL, OLED materials, cathode materials, RO membranes, battery separators	1980
Ochang	Polarizers	2005
Iksan	EP compounds, ABS compounds	1991
Iksan	Battery materials	2011
Overseas		
China		
Tianjin	EP	2004
Ningbo	EP	1995
Guangzhou	OLED materials, EP	2018
Wuxi	Cathode materials	2018
Quzhou	Cathode precursor	2018
Chongqing	EP	2015
Hangzhou	Optical sheets	2021
Taipei, Taiwan	Polarizers	2004
Hai Phong, Vietnam	OLED polarizers, EP	2017
Wroclaw, Poland	EP	2005
Life sciences:		
Domestic		
Iksan	Biomedicines, synthetic drugs, animal drugs	1995
Osong	Biosimilars, vaccines	2010
Onsan	Pharmaceuticals, agrochemical intermediates	1986

We plan to continue to invest in enhancing our production facilities and upgrading our equipment and manufacturing processes in order to increase our production capacity, achieve additional economies of scale and support production of new products. When making capital expenditure plans, we continually analyze the allocation of our resources around the world, taking into account factors such as anticipated market and product demand, location of our key customers, relative currency values and the cost of goods and labor in various jurisdictions. Our total capital expenditures (consisting of cash used in the acquisition of property, plant and equipment) amounted to Won 6,238 billion in 2019, Won 5,536 billion in 2020, Won 5,774 billion in 2021, Won 1,179 billion for the three months ended March 31, 2021 and Won 2,182 billion for the three months ended March 31, 2022, and we plan to spend approximately Won 9 trillion in 2022 (including amounts already expended in the three months ended March 31, 2022), principally for the construction of separator production facilities in Hungary, the construction of POE and PBAT facilities in Daesan, the expansion of NBL facilities in Malaysia and the expansion of cathode materials production facilities in Gumi.

The following table sets forth the details of our major capital expenditure projects in progress as of March 31, 2022.

Project	Estimated Cost	Amount Expended as of March 31, 2022	Expected Year of Completion
	(in billions of Won)		
Petrochemicals:			
Domestic			
Yeosu Complex			
Expansion of PVC production facilities	90	45	2022
Expansion of CNT production facilities	64	9	2023
Restructuring of ABS facilities	498	0	2024
Daesan Complex			
Expansion of POE production facilities	280	15	2023
Construction of PBAT production facilities	204	9	2023
Overseas			
Malaysia			
Expansion of NBL production facilities	186	106	2023
LG Energy Solution:			
Overseas			
Nanjing, China			
Expansion of small battery and ESS production facilities	4,418	3,262	2026
United States			
Expansion of automotive battery production facilities	2,170	586	2026
Expansion of ultium cell automotive battery production facilities	8,476	1,659	2026
Wroclaw, Poland			
Expansion of automotive battery production facilities	5,573	4,767	2026
Advanced materials:			
Domestic			
Cheongju Complex			
Expansion of cathode materials production facilities	223	17	2023
Gumi Complex			
Expansion of cathode materials production facilities	495	7	2025
Overseas			
Hungary			
Construction of separator production facilities	435	0	2024

Raw Materials

Raw materials and consumables used amounted to Won 15,615 billion in 2019, Won 16,780 billion in 2020, Won 24,101 billion in 2021, Won 4,664 billion for the three months ended March 31, 2021 and Won 7,133 billion for the three months ended March 31, 2022, accounting for 58.9%, 59.4%, 64.0%, 56.6% and 67.4% of the sum of our cost of sales and selling and administrative expenses in 2019, 2020, 2021 and the three months ended March 31, 2021 and 2022, respectively. The main raw material used in our operations is naphtha, which is the principal feedstock used in the production of petrochemical-based products in the petrochemicals segment. Our aggregate purchases of raw materials for the petrochemicals segment, which mainly consist of naphtha, accounted for a significant portion of our raw materials and consumables used in 2019, 2020, 2021 and the three months ended March 31, 2021 and 2022.

We purchase naphtha from a number of sources including GS Caltex, Hyundai Oilbank, Sonatrach, Reliance Industries and BP Singapore, which together supplied approximately half of our naphtha requirements in 2021 and the three months ended March 31, 2022. Such purchases are generally made through term agreements with renewal provisions that typically provide for the supply of a specified range of quantities at prices based on a predetermined formula linked to a measure of crude oil pricing. See "Risk Factors – Risks Relating to Our Business – Fluctuations in the market price of naphtha, which, in turn, is affected by the market price and supply of crude oil, may adversely affect our margins and profits" for a description of risks related to our exposure to fluctuations in crude oil prices. Payments for purchases are generally made through telegraphic transfers and letters of credit within 30 days from the date of the bill of lading.

In addition, we purchase a substantial amount of raw materials for the energy solutions segment and the advanced materials segment from overseas sources. The main raw materials used in the energy solutions segment include cathode materials, precursors and separators, and the main raw materials used in the advanced materials segment include polyester (PET) film and polycarbonate. Our purchases of such raw materials are generally made through purchase orders or agreements with the suppliers on both a regular and an on-demand basis at predetermined prices that may be adjusted by mutual agreement of the parties.

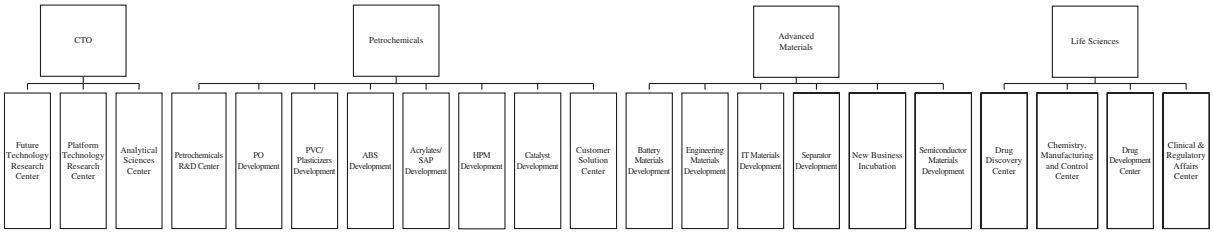
We believe that our agreements with suppliers of raw materials contain commercial terms and conditions that are customary for the industry. Historically, we have not experienced any significant difficulties in obtaining raw materials to satisfy our production requirements.

Research and Development

We compete in highly competitive global markets characterized by evolving industry standards, continual technological development and product innovation. We believe that continued and timely development of new products and enhancements to existing products and manufacturing processes, as well as new technologies, are critical to maintaining our competitive position. Accordingly, we have made, and will continue to make, significant investments in research and development activities. Our total research and development expenses amounted to Won 1,096 billion in 2019, Won 1,116 billion in 2020, Won 1,357 billion in 2021, Won 280 billion for the three months ended March 31, 2021 and Won 357 billion for the three months ended March 31, 2022.

Our research and development activities are carried out both domestically and overseas. As of March 31, 2022, our domestic research and development activities were supported by 6,028 employees working at 14 R&D centers and 15 development groups located throughout Korea, while our overseas research and development activities were supported by 461 employees in the United States, Europe and China. Each of our R&D centers is generally dedicated to production technologies or products of a particular business segment, and each of our development centers is generally dedicated to production technologies or products of a particular division within a business segment. For example, our battery R&D center focuses on developing battery materials, including materials for high performance cathodes and anodes, while our automotive battery development center concentrates on developing high energy density electric vehicle battery packs. In addition, our chief technology officer oversees certain research and development activities to maintain and enhance our main base technologies as well develop new technologies to strengthen our future competitiveness.

The following chart sets forth the organizational structure of our research and development activities as of March 31, 2022.



We have succeeded in developing a number of new products, such as new catalysts, specialty polymers, batteries and new production technologies. For example, in 2020, we developed a new biodegradable material with 100% bio contents using corn-based glucose and crude glycerol. This material has similar physical properties and transparency as PP, which is commonly used to make plastic, and more than 90% of the material biodegrades within 120 days, allowing it to become an environmental-friendly biodegradable material.

Intellectual Property

We depend on our proprietary technologies and production know-how to maintain our competitive position in the markets in which we operate, and we produce intellectual property through our extensive research and development activities. Our general policy is to apply for patents on an ongoing basis, in Korea and other appropriate jurisdictions, on patentable developments that are considered to have commercial significance. Our portfolio of patents covers our proprietary technologies used in products as well as many aspects of our product design and manufacturing processes. We may also purchase patents from other companies if we determine such patents to be necessary to an area of our business.

We seek to protect our intellectual property and proprietary rights primarily through intellectual property laws, relying on a combination of patent, trademark, trade secret and other intellectual property laws in Korea, the United States and other countries. We also rely on unregistered proprietary rights, including know-how and trade secrets, related to our operations. Our know-how and trade secrets may not be patentable, but they are valuable in that they enhance our ability to provide high-quality products to our customers.

As of March 31, 2022, we owned 10,939 patents and 327 registered trademarks in Korea, as well as 21,470 patents and 1,237 registered trademarks outside Korea. As of such date, we also had applications pending for a number of patents and trademarks both in and outside Korea.

We produce some of our products under licensing or technical assistance agreements with overseas producers or technology providers. In general, these agreements provide for the grant to us of a license to manufacture and sell specific products both in Korea and overseas during a fixed but usually renewable term in return for the payment by us of royalties on our sales of these products, or for the provision of technical support for our production or research and development activities in return for the payment of a fixed fee. For example, we have entered into licensing and technical assistance agreements with Kellogg Brown & Root LLC with respect to polycarbonate hydro-thermal plastic recycling and Technip Zimmer GmbH with respect to polybutylene adipate terephthalate.

We consider our licensing and technical assistance agreements to be important to our business, and any substantial reduction in the willingness of global producers or technology providers in our business segments to enter into such arrangements with us could adversely affect us. Based on our prior experience, we believe that we will be able to maintain our existing material licensing and technical assistance agreements as necessary.

We require our research and development employees and many of our customers to enter into confidentiality agreements prohibiting them from disclosing our proprietary information or technology. In addition, we have developed internal policies to promote the development of inventions, ideas, discoveries, improvements and copyrightable materials by our employees and to compensate fairly employees who achieve such results arising from their employment, in accordance with the Invention Promotion Act.

Competition

Because we operate several business segments in different industries with many product categories, we face a broad range of competition from existing and new competitors ranging from large multinational companies to highly specialized entities that focus on a limited number of business lines. However, we believe that the depth and breadth of our experience and technological capabilities, combined with our extensive global network, substantial global market share for many of our major products and leading brand recognition provide us with significant competitive advantages, including customer loyalty, responsiveness to changing demand and economies of scale, over existing competitors or potential new competitors. We compete in our various business segments based on the following factors:

- product performance, quality and reliability;
- development of new and innovative products and manufacturing processes;
- ability to accurately identify and respond to emerging regulatory and industry trends and customer needs for product features and performance characteristics;
- close collaboration with customers on product development;
- competitive pricing;
- successful and timely expansion of production capacity;
- ability to provide a stable supply of products in a timely manner to customers;
- effectiveness of sales and marketing efforts; and
- brand recognition and financial strength.

Petrochemicals

Our petrochemicals segment faces competition mainly from global and local producers of petrochemical products (including other major Korean petrochemical companies), both in the domestic and overseas markets. The petrochemical industry is highly cyclical and demand for petrochemical products has fluctuated depending on general economic conditions in Korea and overseas. In particular, general economic conditions in China, one of the largest markets for petrochemical products globally, has had a significant impact on the business of the petrochemicals segment. An imbalance between supply and demand, as well as the emergence of low-cost producers in Asia and the Middle East, have resulted in pricing pressures as well as uncertainty regarding future prospects for the global petrochemical industry. While prices and margins in the Korean and global market for petrochemical products had improved in recent years due to stronger demand for such products, the petrochemical industry has suffered in the past from, and continues to face the prospects of, an oversupply of petrochemical products, and it is uncertain whether prices and margins in the domestic and global market for petrochemical products can be sustained. For instance, since 2020, demand in China has from time to time been adversely impacted by lockdowns in the country due to COVID-19, and higher oil prices, due to sanctions against Russia that have resulted from Russia's invasion of Ukraine among others, have been exerting upward pressure on our cost of sales. In addition, petrochemicals, which had traditionally been considered to be low value-added products, are

now transforming into high value-added products as customers' demands are becoming increasingly specific and segmented. As a result, we will need to strengthen our research and development and market intelligence capabilities in order to stay competitive and retain market recognition.

We believe that the competitive position of our petrochemicals segment is enhanced by the vertical integration of our petrochemical operations, which provides us with stable and cost-competitive supplies of key raw materials and additives necessary for the production of higher-value-added downstream products such as synthetic resins and other petrochemical-based compounds. We seek to improve our operational efficiency and optimize our overall product portfolio in order to maintain our margins and strengthen our market position.

LG Energy Solution

LG Energy Solution, which comprises our energy solutions segment, primarily competes with major lithium ion battery manufacturers in Japan, China and Korea. The lithium ion battery industry is highly competitive, with a number of local and international producers competing in each of the major markets, some of which have larger market shares and greater brand recognition than us, in particular geographic and product segments. While significant technological improvements in lithium ion batteries used in mobile devices have been made over the past decade, the technology underlying automotive lithium ion batteries is still evolving, and extensive research and development will continue to be necessary to maintain competitiveness, with substantial capital investments required of existing as well as new producers.

We believe that the competitive position of our energy solutions segment is enhanced by our long operating history and technological capabilities in the area of lithium ion batteries, especially those designed for use in electric vehicles, as well as our existing relationships with a broad base of customers in the domestic and global electronics and automobile industries. We plan to continue to invest in research and development and increase our production capacity in key markets such as the United States to take advantage of the expected increase in future demand for lithium ion battery products.

Advanced Materials

Our advanced materials segment faces competition from domestic and international producers of core materials for advanced products such as batteries, displays, semiconductors, automotive parts and water treatment filters, many of which are integrated with downstream manufacturers or upstream suppliers of key raw materials. Demand for such core materials tends to fluctuate based on demand for the relevant end-use goods such as electronics products and automobiles, which, in turn, depends on general economic conditions in Korea and overseas, including in China. Due to the capital intensive nature of the industry and the high production volumes required to achieve economies of scale, the international market for such core materials is characterized by competition among a relatively small number of major domestic and international producers. We compete principally with producers based in Korea, China and Japan, on the basis of product quality, price, capacity, customer relationships and geographic location.

Life Sciences

The pharmaceuticals sector in Korea and overseas is highly fragmented and intensely competitive. Drug manufacturers primarily compete based on brand awareness and reputation, price, product efficacy, product side effects, marketing, customer service and customer support. Our life sciences segment's competitors include other global and domestic research-based pharmaceutical companies, as well as smaller companies with a more limited therapeutic focus and generic drug manufacturers. We mainly compete with other companies that manufacture and sell products that treat similar diseases or indications as our major products.

Environmental Matters

We actively seek to engage in environmentally-responsible management of our operations and to protect the environment from damage resulting from our operations. To this end, we have implemented a management system designed to promote safety, health and environmental preservation in our operations which are consistent with international best practices. For example, we receive Standardization of International Organizations 14001 certifications for our production facilities and reacquire such certification every three years. We also reduce our emission of pollutants by using alternative processing methods and raw materials, as well as utilizing pollution prevention facilities. We periodically inspect our pollution prevention facilities and upgrade any old equipment to ensure optimal operations.

Our production activities are subject to regulation under the Clean Air Conservation Act (the "CACA") and the Water Environment Conservation Act (the "WECA") of Korea. The CACA and WECA and the regulations thereunder prescribe the permits required for emitting air pollutants or wastewater and the maximum permissible levels of pollutants that can be contained in air emissions and wastewater, respectively, discharged by our production facilities. Pursuant to our environmental management policies we seek to comply with relevant environmental zoning requirements related to the operation of our facilities, maintain all relevant environmental permits required for air pollutant emissions or wastewater discharging at our facilities and operate environmental control facilities at our production facilities that reduce the level of pollutants contained in air and water discharges to permissible levels.

Our production activities are also subject to the Soil Environment Conservation Act (the "SECA"). Under the SECA, facilities which may cause any significant soil contamination such as underground storage tanks must undergo periodic soil contamination testing. The SECA and the regulations thereunder set the permissible levels of soil contamination and require persons deemed to have caused soil contamination pursuant to the SECA to carry out clean-up or other remedial action.

Furthermore, our production activities are subject to the Act on the Registration and Evaluation of Chemicals (the "AREC"), which is aimed at protecting the environment from risks caused by chemicals. Under the AREC, we are required to obtain a chemicals registration or file a chemicals report with the Ministry of Environment, which evaluates the degrees of hazard for such chemicals. We are also required to provide information regarding changes in intended usage, the degrees of hazard or annual production of chemicals to the Ministry of Environment.

Our production activities may also be subject to other Korean environmental laws, such as the Noise and Vibration Act, Waste Management Act, Ground Water Act and Chemicals Control Act. Under such environmental laws, a business entity that conducts production activity which may cause environmental pollution as described therein must obtain a permit or file a report and must comply with the relevant regulations.

Moreover, our production activities are subject to the Act on the Integrated Control of Pollutant-Discharging Facilities (the "ICPDF Act"), which was enacted in December 2015. Under the ICPDF Act, we will be required to obtain permits for our pollutant-discharging facilities by the end of 2022, which permits will take precedence over the CACA, the WECA, the SECA, the Noise and Vibration Act and the Waste Management Act with regard to the permission for and control of such facilities through integrated criteria for the discharge of pollutants currently regulated separately pursuant to such environmental laws. Accordingly, we will be required to comply with the maximum discharging criteria prescribed in the ICPDF Act and the regulations thereunder or any permit granted thereunder from January 2023.

In addition, our production activities are subject to the Act on the Allocation and Trading of Greenhouse Gas Emission Permits (the "Emission Permits Act"). The Emission Permits Act and the regulations thereunder establish the Korean emissions trading scheme, under which companies whose greenhouse gas emission amounts for the past three years exceed certain thresholds are allocated a limited volume of emission allowances and are allowed to trade surplus or deficient emission allowances.

We are also subject to the laws and regulations of jurisdictions outside of Korea in which we have production facilities. While we believe that we are in compliance in all material respects with applicable environmental laws and regulations, the discharge of oil, gas or other pollutants into the air, soil or water may nevertheless give rise to liabilities and may require us to incur costs to remedy the damage caused by such discharges. Furthermore, environmental laws may change in the future, which may require us to modify or curtail our production activities or make additional capital expenditures or may otherwise adversely affect our operations. See "Risk Factors – Risks Relating to Regulation – We are subject to strict environmental regulations that could cause our operations to be interrupted."

Health and Safety

We believe that we are in compliance with applicable health and safety laws and regulations in all material respects. Health and safety is a priority at all of our facilities. We have implemented a number of initiatives to create a safer workplace, including the establishment of an audit program to register and monitor all on-site safety activities and risks and conducting regular training programs for our employees. We have also established dedicated on-site departments at our facilities in charge of the health and safety of our employees and operate monitoring systems to facilitate timely identification of and reaction to accidents. In December 2021, we appointed our first chief safety and environment officer to oversee all safety and environmental matters. We continue to review and improve the effectiveness and appropriateness of our systems and policies through periodic reviews and certifications by external experts.

Insurance

We have comprehensive insurance policies that cover different aspects of our business and properties, including property damage package insurance, liability insurance and cargo insurance as well as a business interruption insurance which covers certain of the losses of profits which may result from an industrial accident. We pay premiums for our insurance policies based on international market rates. In 2021 and the three months ended March 31, 2022, we paid premiums for major insurance policies totaling Won 163 billion and Won 22 billion, respectively. We consider our insurance coverage to be in accordance with industry standards.

Employees

As of March 31, 2022, we had a total of 13,944 full-time employees and 328 contract and part-time employees (excluding employees of our subsidiaries). The following table provides a breakdown of our employees on a consolidated basis, as of the dates indicated.

As of	Number of Full-time Employees	Number of Contract/ Part-Time Employees	Total Number of Employees
December 31, 2019.....	19,973	189	20,162
December 31, 2020.....	19,854	231	20,085
December 31, 2021.....	23,155	373	23,528
March 31, 2022	23,543	450	23,993

Like most Korean companies, we grant our employees annual increases in basic wages and pay periodic bonuses. We also provide a wide range of fringe benefits to our employees, including housing and meal subsidies, medical, death and accident insurance, periodic health examinations, educational subsidies for long-term employee's children, special subsidies for significant personal events (such as marriage, birth of children or death of family members) and use of recreational facilities.

A significant number of our employees are members of our five labor unions, which are generally organized based on business segment and production site. We annually negotiate collective bargaining agreements and wage agreements with the labor unions, which were last entered into in November 2021 and December 2021 for collective bargaining agreements and March 2021 for wage agreements. Annual

wage increases are determined jointly by employee and management representatives in consideration of our performance, the rate of inflation and economic growth in Korea and other relevant factors. We have not experienced any material labor disputes in recent years and consider our current relations with our workforce to be good.

For employees based in Korea, in accordance with the National Pension Act of Korea, we contribute an amount equal to 4.5% of an employee's standard monthly income, and each employee contributes 4.5% of his or her standard monthly income, into a personal pension account for such employee. In addition, in accordance with the Act on the Guarantee of Employees' Retirement Benefits, we have adopted retirement pension plans for our employees. Contributions under the retirement pension plans are deposited annually into a financial institution, and an employee may elect to receive a monthly pension or a lump-sum amount upon retirement pursuant to either a defined benefit plan or a defined contribution plan. The defined benefit plan guarantees a certain payout at retirement, according to a fixed formula based on the employee's average salary and the number of years for which the employee has been a plan member. On a consolidated basis, we had net defined benefit liabilities of Won 27 billion as of March 31, 2022. For further information regarding our defined benefit plan, see Note 16 of the notes to our Consolidated Interim Financial Statements.

We are also subject to the local labor and employment laws of various jurisdictions outside of Korea in which we operate. For example, in China, pursuant to local laws and regulations, we contribute to several insurance and employee welfare schemes for our employees. We make contributions to our employee's social insurance plan, housing fund, basic pension insurance fund, basic medical insurance fund and unemployment, maternity and work-related insurance funds in accordance with applicable Chinese laws and regulations.

Legal Proceedings

We may from time to time become a party to various legal, arbitration or administrative proceedings arising in the ordinary course of business.

In May 2020, a vapor leak accident occurred at a factory of LG Polymers India Pvt. Ltd. ("LG Polymers"), our consolidated subsidiary, located in Visakhapatnam, Andhra Pradesh, India, which allegedly resulted in the deaths of 12 people and hospitalization of more than 100 people. In the same month, various governmental agencies in India, including the National Green Tribunal of India (the "NGT"), the Andhra Pradesh High Court and the State Government of Andhra Pradesh, commenced a number of investigations related to the accident and LG Polymers, and the NGT directed LG Polymers to deposit interim compensation in the amount of INR 50 Crores (approximately U.S.$6.7 million) with the District Magistrate, Visakhapatnam, which was promptly made. In June 2020, the NGT found LG Polymers to be liable for the accident and ordered the deposited interim compensation amount to be applied towards restoration of the environment as well as the victims. LG Polymers filed an appeal against NGT's decision in the same month, which case is pending before the Supreme Court of India. In July 2020, 12 executive officers and employees of LG Polymers were arrested on related charges, and in August 2020, all such executive officers and employees were released on bail. In October 2020, the Supreme Court of India deferred LG Polymers' appeal until after the Supreme Court of India's ruling on whether the NGT had the authority for its rulings in May and June 2020. In April 2021, in response to LG Polymers' application seeking permission from the Andhra Pradesh High Court to sell raw materials and finished goods, the Court rendered an order permitting LG Polymers to sell the relevant inventory while directing LG Polymers to deposit the proceeds from its sales of inventories with the District Collector of Vishakhapatnam. Since then, LG Polymers has deposited the sales proceeds in the amount of INR 90 Crores (approximately U.S.$12 million). A number of private claims against LG Polymers have also been made in the NGT and the Andhra Pradesh High Court, and the plaintiffs are seeking various remedies including compensation for deceased and injured individuals, compensation for commercial losses and property damage, claims for environmental damage and remediation costs, among others. Notwithstanding the deposits of the interim compensation amount and the proceeds from the sale of LG Polymers' inventories with the District Magistrate, Visakhapatnam, the total amount of costs to be incurred as a result of such investigations and claims in connection with the accident remains subject to significant

uncertainties. LG Polymers' potential liabilities for future claims, lawsuits and enforcement actions relating to the accident, together with the potential costs of implementing remedies that may be sought against it in various proceedings, cannot be accurately estimated at this time.

In April 2019, the Ministry of Environment of Korea announced that it was investigating a number of Korean chemical companies and air pollutant emissions measurement companies operating in the Yeosu industrial area based on allegations of manipulated and falsified emissions measurements since 2015, and 12 of our executive officers and employees were subsequently charged by the local prosecutor's office in connection with related charges. In October 2019, the Suncheon Branch of the Kwangju District Court found these executive officers and employees guilty of certain charges and imposed penalties ranging from fines to imprisonment on such executive officers and employees. Following appeal by both the prosecution and the defendants, in January 2021, the appellate court affirmed the district court's decision. The appellate court's decision was appealed to the Supreme Court of Korea, where the case is currently pending, and the outcome of which cannot be predicted at this time.

Similar allegations of price fixing for lithium batteries and lithium battery products were made against us in a class action lawsuit filed in 2016 by plaintiffs in Israel, which claims were suspended due to a technical error regarding legal procedure and have yet to be reasserted. Accordingly, we cannot predict the outcome or impact of such lawsuit to us.

In November 2020, the Comptroller General of Brazil initiated an administrative investigation against over 20 corporations, including our subsidiary LG Chem Brasil Intermediacao de Negocios do setor quimico Ltda ("LG Chem Brazil"), for allegedly purchasing information that was obtained in violation of the Brazilian Clean Company Act, and we were subsequently included as a party to the investigation in May 2021. Although we and LG Chem Brazil intend to vigorously defend against such allegation, we cannot predict the outcome of the investigation at this time.

In July 2021, a number of putative class action lawsuits were filed in the United States against GM for failing to disclose and adequately repair such alleged defects of the batteries, and in September 2021, the plaintiffs of such putative class actions filed amended complaints to include us as defendants, among others, for manufacturing the allegedly defective batteries. While we intend to vigorously defend against such claims, we cannot predict the outcome or impact of such lawsuit to us at this stage.

Except as described above, we are not a party to any litigation or other legal or administrative proceedings that may have a material adverse effect on our business, financial condition or results of operations.

Under the relevant provisions of the Korean Commercial Code relating to split-offs, both the subsidiary and the parent company remain jointly and severally liable after the corporate split-off for all of their liabilities existing prior to the corporate split-off unless such joint and several liability has been successfully eliminated through a special resolution adopted at a general meeting of shareholders and protection procedures for creditors of the affected debt, including consents of such creditors or provision of sufficient security for dissenting creditors. Accordingly, LG Energy Solution and we remain jointly and severally liable for each other's debts and other liabilities that existed prior to December 1, 2020, which is the record date of the split-off of LG Energy Solution, that currently remain outstanding. LG Energy Solution is the successor-in-title to all the assets and liabilities and rights and obligations that were related to the operations of the energy solutions segment conducted by us before the split-off, as well as all authorized licenses, employment relations, contracts and lawsuits that were directly related to such operations. The remaining assets and liabilities and rights and obligations related to other business areas remain with us, and LG Energy Solution remains jointly and severally liable for such liabilities.

Board of Directors

Our board of directors has the ultimate responsibility for the administration of our affairs. Our articles of incorporation currently provide for a board of directors consisting of no less than three directors and no more than 11 directors, at least three and a majority of whom must be outside directors. Standing directors are directors who are full-time executive officers of our company, while outside directors are non-standing directors elected from among those persons who do not have a special relationship with us that would interfere with the exercise of their independent judgment. Directors are elected at a general meeting of shareholders by a majority vote of those present or represented so long as the affirmative votes also represent no less than 25% of the issued and outstanding shares with voting rights. Our outside directors are elected from among candidates who meet the qualifications set forth in the Korean Commercial Code. Each director may be elected for a term of office of three years, which will end at the close of an annual general meeting of shareholders relating to the latest financial year within the three year term, or for a shorter term if so determined upon his or her election. Directors may serve any number of consecutive terms and may be removed from office at any time by a special resolution adopted at a general meeting of shareholders.

The representative director is a director elected by a resolution of our board of directors (which resolution requires the affirmative vote of a majority of our directors present at the relevant board meeting in which a majority of our directors in office are present) and is empowered to make day-to-day business decisions. Hak Cheol Shin currently serves as our representative director.

Directors

The table below sets forth our directors and their positions. The business address of each of our directors, as well as our executive officers, is our registered office at LG Twin Towers, 128, Yeoui-daero, Yeongdeungpo-gu, Seoul 07336, Korea.

Name	Year of Birth	Position	End of Current Term	Other Current Positions
Bong Seok Kwon...	1963	Non-standing director	March 2025	Vice chairman; chief operating officer of LG Corporation
Hak Cheol Shin	1957	Representative director	March 2025	Vice chairman, chief executive officer
Dong Seok Cha	1963	Standing director	March 2024	Chief financial officer; chief risk officer
Dong Min Jeong	1960	Outside director	March 2023	Partner, Barun Law LLC
Mun Su Kim.....	1955	Outside director	March 2024	Non-standing tax judge, National Tax Tribunal
Hyunjoo Lee.....	1976	Outside director	March 2025	Professor of Chemical and Biomolecular Engineering, KAIST
WhaSun Jho.....	1966	Outside director	March 2025	Policy advisor, Professor of Political Science and International Studies, Yonsei University

Bong Seok Kwon has served as our non-standing director since March 2022. Mr. Kwon also serves as our vice chairman and the chief operating officer of LG Corporation. Previously, Mr. Kwon served as the chief executive officer of LG Electronics. Mr. Kwon holds a Master of Business Administration degree from the University of Helsinki.

Hak Cheol Shin has served as our representative director since March 2019. Mr. Shin also serves as our vice chairman and chief executive officer. Previously, Mr. Shin served as vice chair and executive vice president of 3M International Operations. Mr. Shin holds a Bachelor of Science degree in mechanical engineering from Seoul National University.

Dong Seok Cha has served as our standing director since March 2020. Mr. Cha also serves as our chief financial officer. Previously, Mr. Cha served as chief financial officer of S&I Corp. and Servone. Mr. Cha holds a Bachelor of Arts degree in accounting from Kyungpook National University.

Dong Min Jeong has served as our outside director since March 2017. Mr. Jeong also serves as a partner at Barun Law LLC. Previously, Mr. Jeong served as a chief prosecutor at the Daejeon District Prosecutors' Office and the Seoul Western District Prosecutors' Office. Mr. Jeong holds a Bachelor's degree in law from Korea University.

Mun Su Kim has served as our outside director since March 2018. Mr. Kim also serves as an adjunct professor in taxation at the University of Seoul and a member of the taxation system development review committee at the National Tax Service. Previously, Mr. Kim served as deputy director of the National Tax Service. Mr. Kim holds a Bachelor of Arts degree in economics from Korea University, a Master of Arts degree in economics from American University and a Doctor of Philosophy degree in taxation from the University of Seoul.

Hyunjoo Lee has served as our outside director since March 2022. Ms. Lee also serves as a professor of chemical and biomolecular engineering at the Korea Advanced Institute of Science and Technology. Previously, Ms. Lee served as an associate professor in chemical engineering at Yonsei University. Ms. Lee holds a Bachelor of Science degree in chemical engineering from Seoul National University and a Master of Science degree and a Doctor of Philosophy degree in chemical engineering from Caltech.

WhaSun Jho has served as our outside director since March 2022. Ms. Jho also serves as a professor in political science and international studies at Yonsei University, a policy advisor at the Ministry of Personnel Management, an advisor at the Anti-Corruption and Civil Rights Commission and a member of the Korean Academy of Science and Technology. She has previously served as a visiting professor at Harvard University. She has a Bachelor of Arts degree and a Master of Arts degree in political science and international studies from Yonsei University and a Doctor of Philosophy degree in politics from Northwestern University.

Executive Officers

The names and positions of our executive officers are set below. Our executive officers are appointed by the board of directors.

Name	Year of Birth	Title and Responsibilities	Executive Officer Since
Jeewoong Son	1964	President and head of life sciences	2017
Sungmin Kim	1962	Executive vice president and chief human resources officer	2021
Jeongdae Kim	1964	Executive vice president and head of the internal audit department	2021
Chul Nam	1966	Executive vice president and head of advanced materials	2022
Kuglae Noh	1964	Executive vice president and head of petrochemicals	2020
Jiyung Yu	1962	Executive vice president and chief technology officer	2018
Dongseok Cha	1963	Executive vice president and chief financial officer	2020
Sung-woo Hur	1965	Executive vice president and head of global business development (petrochemicals division)	2020

Board Practices

In accordance with our articles of incorporation, we have established the following committees under our board of directors:

- Management Committee;
- Audit Committee;
- Nomination Committee for Outside Directors;
- Internal Trade Committee; and
- ESG Committee.

Management Committee

The Management Committee is responsible for increasing management efficiency of the board of directors by overseeing decisions with respect to operational and management matters in the ordinary course of business as well as financial matters below certain thresholds.

The Management Committee currently consists of two standing directors: Hak Cheol Shin and Dong Seok Cha. Meetings of the Management Committee are held on an *ad hoc* basis when necessary.

Audit Committee

Under the Korean Commercial Code, and our articles of incorporation, we are required to have an Audit Committee consisting of three or more directors, at least two-thirds of whom must be outside directors. Members of the Audit Committee are elected by our shareholders at the general meeting of shareholders. The committee reviews all audit and compliance-related matters and makes recommendations to our board of directors. Our Audit Committee's primary responsibilities include:

- engaging external auditors and evaluating their performance;
- reviewing annual financial statements;
- establishing, implementing and reviewing performance of internal audit plans;
- reviewing audit results and reports, including management comments and recommendations;
- reviewing, and making recommendations to enhance, our system of controls and policies;
- reviewing remedial measures taken in respect of improprieties identified by audit activities; and
- examining improprieties or suspected improprieties.

In connection with the annual general meeting of shareholders, the committee examines the agenda for, and financial statements and other reports to be submitted by the board of directors at, each such meeting.

The Audit Committee currently consists of three directors: Young-ho Ahn, Dong Min Jeong and Mun Su Kim. Meetings of the Audit Committee are held quarterly, and more often on an *ad hoc* basis if necessary.

Nomination Committee for Outside Directors

The Nomination Committee for Outside Directors is responsible for reviewing and recommending candidates for outside directors to our board of directors for election at the general meeting of shareholders.

The Nomination Committee for Outside Directors currently consists of three directors: Hak Cheol Shin, Dong Min Jeong and Mun Su Kim. Meetings of the Nomination Committee for Outside Directors are held when an outside director needs to be appointed.

Internal Trade Committee

The Internal Trade Committee is responsible for reviewing and authorizing internal trade transactions as well as establishing and enforcing policies relating to internal trade transactions.

The Internal Trade Committee currently consists of four directors: Mun Su Kim, Dong Min Jeong, WhaSun Jho and Dong Seok Cha. Meetings of the Internal Trade Committee are held on an *ad hoc* basis if necessary.

ESG Committee

The ESG Committee is responsible for establishing and enforcing policies and strategies relating to certain non-financial aspects of our business, generally consisting of environment, social responsibility and corporate governance matters, in order to promote sustainable development and enhance our corporate value.

The ESG Committee currently consists of five directors: Hak Cheol Shin, Dong Min Jeong, Mun Su Kim, WhaSun Jho and Hyunjoo Lee. Meetings of the ESG Committee are held biannually, and more often on an *ad hoc* basis if necessary.

Compensation of Key Management

Remuneration

The aggregate compensation (including short-term and long-term benefits and retirement and severance benefits) granted to our key management, consisting of our directors, was Won 88 billion, Won 99 billion, Won 128 billion, Won 18 billion and Won 25 billion in 2019, 2020, 2021 and the three months ended March 30, 2021 and 2022, respectively. As of March 31, 2022, there were no loans or stock options granted by us to any of our directors or executive officers.

Interests of Directors and Executive Officers

As of March 31, 2022, there were no outstanding transactions other than in the ordinary course of business undertaken by us in which our directors or executive officers were interested parties.

Certain of our directors and executive officers have direct or indirect beneficial interests in our common shares, but none of them holds more than 5% of our outstanding common shares. Certain of our directors and executive officers have direct or beneficial interests in companies with which we have engaged in transactions, including those in the ordinary course of business. As a result, potential conflicts of interest between their duties to us and their private interests could arise.

PRINCIPAL SHAREHOLDERS

As of March 31, 2022, we had a total of 70,592,343 common shares and 7,688,800 preferred shares issued, including 367,529 common shares and 6,041 preferred shares held by us as treasury shares. The following table sets forth certain information relating to our shareholder composition as of such date.

Shareholder	Number of Common Shares	Common Share Ownership Percentage	Number of Preferred Shares	Preferred Share Ownership Percentage
LG Corp.	23,534,211	33.3%	–	–
National Pension Service	4,797,025	6.8%	–	–
Others	42,261,107[(1)]	59.9%	7,688,800[(2)]	100.0
Total	70,592,343	100.0%	7,688,800	100.0%

(1) Includes 21,349 common shares owned by "specially-related" parties (as defined in "Certain Relationships and Related Party Transactions") of LG Corp., including 20,746 common shares owned by LG Yonam Foundation, 600 common shares owned by the representative director and chief executive officer of LG Display, James (Hoyoung) Jeong, and 3 common shares owned by our outside director, Kook-heon Char.

(2) Includes 200 preferred shares owned by the representative director and chief executive officer of LG Display, James (Hoyoung) Jeong.

Except as described above, no other person or entity or group of persons or entities known by us to be acting in concert, directly or indirectly, owned 5% or more of our issued common shares or exercised control or could exercise control over us as of the date of this offering circular.

LG GROUP

According to the latest report on Korean business groups released by the Korea Fair Trade Commission on May 1, 2022, LG Group was Korea's fourth-largest business group in terms of combined assets and comprised 73 companies, including 14 that were listed on either the KRX KOSPI Market or the KRX KOSDAQ Market of the Korea Exchange (together, the "KRX Markets"). On June 22, 2022, 12 companies, including 4 that were listed on the KRX Markets, split off from the LG Group and formed the LX Group, following which the LG Group consisted of 61 companies, including 10 that were listed on the KRX Markets. As of December 31, 2021, the total assets of the companies included in the combined financial statements of the LG Group amounted to approximately Won 168 trillion, according to the Korea Fair Trade Commission.

Originating from Lucky Chemical Co., Ltd., which was established in 1947 and initially engaged in the production of cosmetics, plastic goods and household products, LG Group has evolved into a major business group, with interests in the electronics, chemicals, telecommunications, engineering, information technology and power generation industries. Member companies of the LG Group are organized into three sub-groups: the electronics group, the chemicals group and the telecommunications and services group. The following chart shows select member companies of the LG Group as of the date of this offering circular.

Electronics	Chemicals and Batteries	Telecommunications and Services
LG Electronics Inc.	LG CHEM, LTD.	LG Uplus Corp.
LG Display Co., Ltd.	LG Energy Solution	GIIR Corp.
LG Innotek Co., Ltd.		LG CNS Co., Ltd.
		LG Management Development Institute
		LG Sports, Ltd.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

We engage from time to time in various transactions with related parties, which include member companies of the LG Group. See "LG Group." We believe that we have conducted our transaction with related parties as we would in comparable arm's-length transactions with a non-related party, on a basis substantially as favorable to us as would be obtainable in such transactions.

Under the Monopoly Regulation and Fair Trade Act of Korea and the regulations thereunder, in the event that (i) we provide funds, securities or assets to, or enter into certain transactions with, a "specially-related" party, which includes affiliates, and (ii) the value of such transaction or provision is greater than either (x) 5% of the greater of our paid-in capital and total capital or (y) Won 5 billion, we are required to obtain approval for such transaction or provision by resolution of our board of directors, and to disclose the main terms and conditions of such transaction or provision to the public. We are currently required to disclose any such transaction or provision within one day following adoption of the relevant resolution.

Under the Korean Commercial Code, in the event that we plan to enter into a transaction with (i) a major shareholder who owns or beneficially owns more than 10% of the total number of our issued and outstanding shares (other than non-voting shares) or exerts influence on our important management issues, (ii) a director, (iii) a spouse or lineal ascendant or descendent of the persons described in (i) and (ii), (iv) a lineal ascendant or descendent of a spouse of the persons described in (i) or (ii), (v) a company in which half or more of the total number of issued and outstanding voting shares is held by a person falling under (i) through (iv), solely or jointly with others, or its subsidiary company, or (vi) a company in which half or more of the total number of issued and outstanding voting shares is held by a person falling under (i) through (iv) together with a company falling under (v), we are required to obtain prior approval by more than two-thirds of our board of directors. In connection with the approval by the board of directors, the major terms of the transaction must be disclosed, and the terms and conditions as well as the procedure of the transaction are required be structured and conducted in a fair manner.

Furthermore, as a publicly listed company in Korea, we are restricted under the Korean Commercial Code from providing any loan, guarantee or collateral to or for the benefit of any of our major shareholders or their specially-related parties, directors (including de facto directors for the purpose of this restriction as provided in the Korean Commercial Code), executive officers or auditors, unless certain exceptions apply. In addition, as a company listed on the Korea Exchange with total assets of not less than Won 2 trillion as of the end of the most recent fiscal year, if we intend to engage in any of the following transactions with or for the benefit of our largest shareholder (or such shareholder's specially-related parties) or with or for the benefit of any of our other specially-related parties, the Korean Commercial Code generally requires us to obtain approval of our board of directors for such transaction and report relevant information (such as the purpose of the transaction, the identities of the counterparties, the terms and conditions of the transaction and the estimated value of the transaction) at the first regular general meeting of shareholders held after the board meeting approving such transaction, unless certain exceptions apply: (i) any single transaction the value of which amounts to 1% or more of our total assets or total revenue as of the end of the most recent fiscal year; or (ii) any transaction the value of which, when aggregated with all other transactions executed with the relevant counterparty during the same fiscal year, amounts to 5% or more of our total assets or total revenue as of the end of the most recent fiscal year.

A summary of our material transactions with related parties is set forth below.

Transactions with LG Display Co., Ltd.

Our transactions with LG Display and its subsidiaries consist primarily of sales of display materials, such as OLED polarizers. LG Display is a manufacturer of TFT-LCD and OLED technology-based display panels and a member of the LG Group.

Sales to LG Display and its subsidiaries amounted to Won 1,124 billion, Won 861 billion, Won 635 billion, Won 170 billion and Won 151 billion in 2019, 2020, 2021 and the three months ended March 31, 2021 and 2022, respectively, and total receivables from LG Display and its subsidiaries, which mainly consist of trade receivables, amounted to Won 129 billion, Won 180 billion, Won 112 billion and Won 152 billion as of December 31, 2019, 2020, 2021 and March 31, 2022, respectively.

Transactions with LG Electronics Inc.

Our transactions with LG Electronics and its subsidiaries consist primarily of sales of rechargeable lithium ion batteries for mobile devices, ABS and ESS batteries and purchases of battery manufacturing equipment. LG Electronics is a manufacturer of consumer electronics goods and a member of the LG Group.

Sales to LG Electronics and its subsidiaries amounted to Won 960 billion, Won 1,188 billion, Won 1,170 billion, Won 399 billion and Won 203 billion in 2019, 2020, 2021 and the three months ended March 31, 2021 and 2022, respectively, and total receivables from LG Electronics and its subsidiaries, which mainly consist of trade receivables, amounted to Won 253 billion, Won 357 billion, Won 296 billion, and Won 260 billion as of December 31, 2019, 2020 and 2021 and March 31, 2022, respectively.

Purchases from LG Electronics and its subsidiaries amounted to Won 1,410 billion, Won 1,262 billion, Won 1,828 billion, Won 420 billion and Won 215 billion in 2019, 2020, 2021 and the three months ended March 31, 2021 and 2022, respectively, and total payables to LG Electronics and its subsidiaries, which mainly consist of trade and other payables, amounted to Won 553 billion, Won 390 billion, Won 226 billion and Won 301 billion as of December 31, 2019, 2020 and 2021 and March 31, 2022, respectively.

Transactions with LX International Corp.

Our transactions with LX International Corp. (formerly LG International Corp.) and its subsidiaries consist primarily of sales of ethylene, acrylates and SAP and purchases of some of our raw materials, supplies and services. LX International Corp. is a commodity trading and mining company.

Sales to LX International Corp. and its subsidiaries amounted to Won 185 billion, Won 58 billion, Won 96 billion, Won 19 billion and Won 24 billion in 2019, 2020, 2021 and the three months ended March 31, 2021 and 2022, respectively, and total receivables from LX International Corp., which mainly consist of trade receivables, amounted to Won 14 billion, Won 5 billion, Won 3 billion and Won 1 billion as of December 31, 2019, 2020 and 2021 and March 31, 2022, respectively.

Purchases from LX International Corp. and its subsidiaries amounted to Won 1,035 billion, Won 940 billion, Won 1,577 billion, Won 339 billion and Won 568 billion in 2019, 2020, 2021 and the three months ended March 31, 2021 and 2022, respectively, and total payables to LX International Corp. and its subsidiaries, which mainly consist of trade and other payables, amounted to Won 107 billion, Won 98 billion, Won 201 billion and Won 254 billion as of December 31, 2019, 2020, 2021 and March 31, 2022, respectively.

Transactions with Other Related Parties

In addition to our related companies listed above, we have conducted transactions with other related parties, including LX MMA Corporation, LG CNS Co., Ltd., SEETEC Co., LTD., Huajin New Energy Materials (Quzhou) Co., Ltd., LG Hausys, Ltd. and LG Corp. See Note 31 of the notes to our Consolidated Interim Financial Statements and Note 31 of the notes to our 2021/2020 Financial Statements and 2020/2019 Financial Statements.

TERMS AND CONDITIONS OF THE NOTES

The following are the terms and conditions of the Notes, to be issued by the Company under the fiscal agency agreement for the Notes, substantially in the form in which they (other than the text in italics) will be endorsed on the definitive certificates for the Notes and referred to in the global notes therefor. The following statements do not purport to be a complete description of the Notes and the fiscal agency agreement for the Notes and are qualified in their entirety by reference to the provisions of the Notes and the fiscal agency agreement for the Notes. Unless otherwise specified, defined terms in this section should be interpreted as being applicable only to the Notes.

1. General

(a) This note is one of a duly authorized issue of notes of the Company in the aggregate principal amount of US$ known as its " % Green Notes due 20 " (the "**Notes**") issued or to be issued pursuant to a fiscal agency agreement, dated as of , 2022 (as amended from time to time, the "Fiscal Agency Agreement"), between the Company, Citicorp International Limited and any successor, as fiscal agent (the "Fiscal Agent"), and Citibank, N.A., London Branch and any successor, as registrar (the "Registrar"), paying agent (the "Paying Agent") and as transfer agent (the "Transfer Agent"), the terms of which are hereby incorporated by reference. Copies of the Fiscal Agency Agreement are on file and available for inspection upon prior written request and satisfaction of proof of holdings at the Fiscal Agent's office at 20/F, Citi Tower, One Bay East, 83 Hoi Bun Road, Kwun Tong, Kowloon, Hong Kong, and reference thereto is made for a description of the rights and limitations of rights thereunder of the Holders of the Notes and the duties and immunities of the Fiscal Agent. In acting under the Fiscal Agency Agreement, the agents appointed by the Company thereunder are acting solely as agents for the Company and do not assume any obligation or relationship of agency or trust for or with the Holder, except as specifically described below or in the Fiscal Agency Agreement with respect to the Fiscal Agent. The Holders of Notes will be entitled to the benefits of, and be bound by, and deemed to have notice of, all of the provisions of the Fiscal Agency Agreement. As used herein, the term "Holder" means the person in whose name a Note is registered in the Note Register (as defined below).

(b) The Notes are issuable only as fully registered Notes without coupons in denominations of US$200,000 and any integral multiple of US$1,000 in excess thereof.

(c) The Company covenants that until the earlier to occur of the date on which all of the Notes shall have been delivered to the Fiscal Agent for cancellation and the date on which all of the Notes have become due and payable and monies sufficient to pay the principal of and interest on all of the Notes shall have been made available for payment and either paid or returned to the Company as provided herein, the Company will at all times maintain a Fiscal Agent (which in each case shall be a bank or trust company having a combined capital and surplus of at least US$50,000,000, legally qualified to act as Fiscal Agent). Subject to the foregoing, the Company reserves the right at any time to vary or terminate the appointment of any of the Fiscal Agent and such additional agents as the Company may determine.

2. Payments

(a) Payments of principal of and interest on this Note will be made in such coin or currency of the United States of America as at the time of payment is legal tender for the payment of public and private debts in the United States of America.

(b) Payment of the principal of this Note shall be made, upon presentation and surrender hereof, by wire transfer to the person to whom interest is payable as provided below.

(c) Payments of interest on this Note shall be made by transfer to a US$ account maintained by the payee with a bank in New York, details of which appear on the Note Register on the Record Date (as defined below), subject to the provisions below. The interest so payable on any Interest Payment Date will be paid to the person in whose name this Note is registered at the close of business on the fifteenth day preceding such Interest Payment Date (each, a "Record Date"), whether or not a business day, notwithstanding the cancellation, transfer or exchange of this Note subsequent to the Record Date and on or prior to such Interest Payment Date, and no interest otherwise so payable on any Interest Payment Date shall be paid on this Note if the name of its Holder was entered as such on the Note Register after the close of business on the Record Date next preceding such Interest Payment Date, except if and to the extent the Company shall default in the payment of the interest due on such Interest Payment Date, in which case such defaulted interest shall (unless paid together with principal of this Note in full other than on an Interest Payment Date) be paid to the person in whose name this Note is registered at the close of business on a subsequent record date (which shall be not less than five business days prior to the date of payment of such defaulted interest) established by notice given by mail by or on behalf of the Company to the Holders of Notes not less than 15 days preceding such subsequent record date. If interest is paid together with principal in full on a date that is not an Interest Payment Date, such interest shall be paid upon presentation and surrender of this Note to the Fiscal Agent or to a paying agent.

(d) In any case where the date for the payment of any principal of or interest on any Note is not a day on which banking institutions in Seoul, New York, London and the city where the specified office of the Fiscal Agent is located are open for business (a "Business Day"), then payment of such principal or interest need not be made on such date at such place of payment but may be made on the next succeeding day at such place of payment which is a Business Day with the same force and effect as if made on the date for such payment of principal or interest, and no interest shall accrue for the period after such date.

(e) Any monies paid by the Company to the Fiscal Agent for the payment of the principal of or interest on any Notes and remaining unclaimed at the end of two years after such principal or interest shall have become due and payable and shall have been paid to the Fiscal Agent by the Company shall then be repaid to the Company, and upon such repayment, all liability of the Fiscal Agent with respect to such monies shall thereupon cease and the Holder of any Note representing a claim therefor shall thereafter look only to the Company for payment thereof.

(f) Notwithstanding the foregoing, so long as Notes in the form of a global note (a "Global Note") are held on behalf of the Depository Trust Company ("DTC"), Euroclear Bank SA/NA ("Euroclear"), Clearstream Banking S.A. ("Clearstream") or any other clearing system, each payment in respect of such Global Note will be made to the person shown as the Holder in the Note Register at the close of business of the relevant clearing system on the Clearing System Business Day before the due date for such payments, where "**Clearing System Business Day**" means a weekday (Monday to Friday, inclusive) except December 25 and January 1.

3. Calculation of Interest

Interest on the Notes will be calculated on the basis of a 360-day year consisting of twelve 30-day months.

4. Optional Redemption Due to Changes in Tax Treatment

The Notes may be redeemed at the option of the Company, in whole, but not in part, upon not less than 30 nor more than 60 days' notice, at any time at a redemption price equal to the principal amount thereof plus accrued interest to (but excluding) the date fixed for redemption if, as a result of any change in, expiration of or amendment to the laws of the Republic of Korea ("**Korea**") (or of any political subdivision or taxing authority thereof or therein) or any regulations or rulings promulgated thereunder or any change in the official interpretation or official application of such laws, regulations or rulings, or any change in the official application or interpretation of, or any execution of or amendment to, any treaty or treaties affecting taxation to which Korea (or such political subdivision or taxing authority) is a party, which change, amendment, expiration or treaty becomes effective on or after , 2022, the Company is or would be obligated on the next succeeding due date for a payment with respect to the Notes to pay Additional Amounts (as described in Condition 6 below) with respect to the Notes, and such obligation cannot be avoided by the use of reasonable measures available to the Company; *provided*, however, that (i) no such notice of redemption may be given earlier than 60 days prior to the earliest date on which the Company would be obligated to pay such Additional Amounts, and (ii) at the time such notice of redemption is given, such obligation to pay such Additional Amounts remains in effect. Before giving any notice of such redemption, the Company shall deliver to the Fiscal Agent a certificate of the Company stating that the Company is entitled to effect such redemption and setting forth a statement of facts showing that the conditions precedent to the right of redemption have occurred, together with an opinion of counsel to the effect that such a change in, or amendment to, the laws or treaties of Korea (or of any political subdivision or taxing authority thereof or therein) or any regulations or rulings promulgated thereunder or any change in position regarding the application, administration or interpretation of such laws, treaties, regulations or rulings, has occurred and that all conditions precedent to the right of redemption have occurred.

5. Purchase

The Company may at any time purchase Notes by tender (available to all Holders alike) or in the open market at any price. If the Company shall acquire any Notes, such acquisition shall not operate as or be deemed for any purpose to be a satisfaction of the indebtedness represented by such Notes unless and until such Notes are delivered to the Fiscal Agent for cancellation and are canceled and retired by the Fiscal Agent.

6. Taxation

All payments of principal of, and interest on, the Notes by the Company will be made without deduction or withholding for, or on account of, any present or future taxes, duties, assessments or governmental charges of whatever nature imposed or levied by or on behalf of Korea or by or within any political subdivision thereof or any authority therein having power to tax ("**Korean Tax**"), unless deduction or withholding of such Korean Tax is required by law. In the event that the deduction or withholding of Korean Tax is required by law, the Company will pay such additional amounts ("**Additional Amounts**") as will result in the payment to Holders of the Notes of the amounts which would otherwise have been receivable in respect of principal and interest in the absence of such deduction or withholding, except that no such Additional Amount shall be payable in respect of any Note:

(a) to or on behalf of a Holder who is subject to such Korean Tax in respect of such Note by reason of his being or having been connected with Korea or any political subdivision thereof (including, without limitation, being a citizen or resident or national of, or carrying on a business or maintaining a permanent establishment in, or being physically present in, Korea) otherwise than merely by holding such Note or receiving principal or interest in respect thereof; or

(b) to or on behalf of a Holder who would not be liable for or subject to such deduction or withholding by making a declaration of non-residence or other similar claim for exemption to the relevant tax authority if, after having been requested in writing by the Company to make such a declaration or claim, such Holder fails to do so within 30 days; or

(c) to or on behalf of a Holder who presents a Note (where presentation is required) more than 30 days after the relevant date except to the extent that the Holder thereof would have been entitled to such Additional Amounts on presenting a Note for payment on the last day of such 30-day period; for this purpose the "relevant date" in relation to any payments of interest on, or principal of, any Note means: (i) the due date for payment thereof; or (ii) if the full amount of the monies payable on such date has not been received by the Fiscal Agent on or prior to such due date, the date on which, the full amount of such monies having been so received, notice to that effect is duly given to Holders of the Notes in accordance with the Fiscal Agency Agreement; or

(d) to a Holder that is a fiduciary or partnership or a person other than the sole beneficial owner of any such payment, to the extent that a beneficiary or settlor with respect to such fiduciary, a member of such a partnership or the beneficial owner of the payment would not have been entitled to the Additional Amounts had the beneficiary, settlor, member or beneficial owner been the Holder; or

(e) any combination of paragraphs (a) through (d) above.

The obligation of the Company to pay Additional Amounts in respect of taxes, duties, assessments and governmental charges shall not apply to (a) any estate, inheritance, gift, sales, transfer, personal property or any similar tax, assessment or other governmental charge, (b) any tax, assessment or other governmental charge which is payable otherwise than by deduction or withholding from payments of principal of, or interest on, the Notes, or (c) any tax that would not have been imposed but for a failure by the Holder or beneficial owner (or any financial institution through which the Holder or beneficial owner holds any Note or through which payment on the Note is made) to comply with any certification, information, identification, documentation or other reporting requirements (including entering into and complying with an agreement with the Internal Revenue Service) imposed pursuant to, or under an intergovernmental agreement entered into between the United States and the government of another country in order to implement the requirements of, Sections 1471 through 1474 of the Internal Revenue Code as in effect on the date of issuance of the Notes or any successor or amended version of these provisions, to the extent such successor or amended version is not materially more onerous than these provisions as enacted on such date; *provided* that, except as otherwise set forth in the Notes and in the Fiscal Agency Agreement, the Company shall pay all stamp and other duties, if any, which may be imposed by Korea, the United States or any respective political subdivision thereof or any taxing authority of or in the foregoing, with respect to the Fiscal Agency Agreement or as a consequence of the initial issuance of the Notes.

References to principal or interest in respect of the Notes shall be deemed also to refer to any Additional Amounts which may be payable as set forth in the Notes.

7. Transfer, Exchange and Replacement

(a) The transfer of a Note is registrable (upon the terms and subject to the conditions set forth in the Fiscal Agency Agreement and subject to the requirements of the Company, the Fiscal Agent and the Registrar) on the Note Register upon surrender of such Note for registration at the Registrar's office, duly endorsed by, or accompanied by a written instrument of transfer in a form approved by the Company duly executed by, the Holder hereof or his attorney duly authorized in writing.

(b) In the manner and subject to the limitations and upon payment of the charges (if any) provided in the Fiscal Agency Agreement, Notes may be exchanged for a like aggregate principal amount of Notes of other authorized denominations or for a beneficial interest in a Global Note.

(c) No service charge shall be made for any exchange or registration of transfer provided for in Conditions 7(a) and 7(b) hereof, but the Company may require payment of a sum sufficient to cover any tax or other governmental charge payable in connection therewith.

(d) No registrations of transfers or exchanges of Notes shall be made after notice of redemption of the Notes has been given.

(e) All Notes issued upon any registration of transfer or exchange of Notes shall be the valid obligations of the Company, evidencing the same debt, and entitled to the same benefits, as the Notes surrendered upon such registration of transfer or exchange. Any new Note delivered pursuant to this Condition 7 shall be so dated that neither gain nor loss of interest shall result from such transfer or exchange.

(f) If any Note shall at any time become mutilated or destroyed or stolen or lost, then, provided that such Note, or evidence of the destruction, theft or loss thereof (together with the indemnity hereinafter referred to and such other documents or proof as may be required in the premises) shall be delivered during business hours to the Registrar's office, a replacement Note of like tenor and principal amount will be issued by the Company and, at its request, authenticated by the Registrar and delivered by the Registrar at its office, in exchange for the Note so mutilated, or in lieu of the Note so destroyed or stolen or lost; provided further, that, in the case of destroyed, stolen or lost Notes, (i) neither the Company nor the Registrar shall have notice that such Notes have been acquired by a bona fide purchaser, and (ii) the Company and the Fiscal Agent shall have received evidence satisfactory to them that such Notes were destroyed, stolen or lost, and the Company and the Registrar shall have received an indemnity and/or security and/or prefunding satisfactory to each of them. All expenses and charges associated with procuring such indemnity and/or security and/or prefunding, and the cost of the preparation and issue of a replacement for any Note mutilated, destroyed, stolen or lost, shall be paid by the Holder of such Note. In case such mutilated, destroyed, stolen or lost Note has become or is about to become due and payable, the Company in its discretion may, instead of issuing a new Note, pay or cause to be paid such Note. Every new Note issued pursuant to this Paragraph (f) in exchange for or in lieu of any mutilated, destroyed, stolen or lost Note, shall constitute an additional original contractual obligation of the Company, whether or not the mutilated, destroyed, stolen or lost Note shall be at any time enforceable by anyone. Any new Note delivered pursuant to this Paragraph (f) shall be so dated that neither gain nor loss of interest shall result from such replacement. To the extent permitted by law, the provisions of this Paragraph (f) are exclusive and shall preclude (to the extent lawful) all other rights and remedies with respect to the replacement or payment of mutilated, destroyed, stolen or lost Notes.

(g) The Company and the Fiscal Agent may deem and treat the registered Holder hereof as the absolute owner hereof (notwithstanding any notice of ownership or other writing hereon) for the purposes of receiving payment hereon or on account hereof and for all other purposes, whether or not this Note shall be overdue.

(h) The Company has appointed the Registrar as its agent for the registration of transfers, and for exchanges and replacements, of Notes and has agreed to cause to be kept at the Registrar's office a register (the "**Note Register**") in which, subject to such reasonable regulations as it may prescribe, the Company shall provide for such registration and registration of transfers.

(i) All Notes issued as a result of any transfer, exchange or replacement of Notes shall be delivered to the Holder at the Registrar's office or (at the risk of the Holder) sent by mail to such address as is specified by the Holder in the request for transfer, exchange or replacement.

8. Covenants of the Company

(a) **Limitation on Liens**. So long as any of the Notes are outstanding, the Company will not itself, and will not permit any Principal Subsidiary to, create, incur, issue or assume or guarantee any External Indebtedness secured by any mortgage, charge, pledge, encumbrance or other security interest (a "**Lien**") on any Restricted Property without in any such case effectively providing that the Notes (together with, if the Company shall so determine, any other indebtedness of the Company or such Principal Subsidiary then existing or thereafter created which is not subordinate to the Notes) shall be secured equally and ratably with or prior to such secured External Indebtedness unless, after giving effect thereto, the aggregate principal amount of all such secured External Indebtedness, plus Attributable Debt of the Company and its Principal Subsidiaries in respect of Sale/Leaseback Transactions entered into after the date of the Fiscal Agency Agreement (other than such Sale/Leaseback Transactions as are permitted by paragraph (2) of Condition 8(b) below), would not exceed 15% of Net Tangible Assets; *provided* that nothing contained in this Condition 8(a) shall prevent, restrict or apply to, and there shall be excluded from secured External Indebtedness in any computation under this Condition 8(a), External Indebtedness secured by.

(1) any Lien existing on the date of the Fiscal Agency Agreement or any Lien existing on any Restricted Property prior to the acquisition thereof by the Company or any of its Principal Subsidiaries or arising after such acquisition pursuant to contractual commitments entered into prior to and not in contemplation of such acquisition;

(2) any Lien on any Restricted Property securing External Indebtedness incurred or assumed for the purpose of financing the purchase price thereof or the cost of construction, improvement or repair of all or any part thereof; provided that such Lien attaches to such Restricted Property concurrently with or within twelve months after the acquisition thereof or completion of construction, improvement or repair thereof;

(3) any Lien existing on any Restricted Property of any Principal Subsidiary prior to the time such Principal Subsidiary becomes a Subsidiary of the Company or arising after such time pursuant to contractual commitments entered into prior to and not in contemplation thereof;

(4) any Lien securing External Indebtedness owing to the Company or to a Principal Subsidiary; or

(5) any Lien arising out of the refinancing, extension, renewal or refunding of any External Indebtedness secured by any Lien permitted by any of the foregoing clauses, to the extent of the amount of such External Indebtedness; provided that such External Indebtedness is not secured by any additional Relevant Property.

For the purposes of this Condition 8(a) and Condition 8(b), the giving of a guarantee which is secured by a Lien on any Restricted Property, and the creation of a Lien on any Restricted Property to secure External Indebtedness which existed prior to the creation of such Lien, will be deemed to involve the creation of indebtedness in an amount equal to the principal amount guaranteed or secured by such Lien; but the amount of indebtedness secured by Liens on Restricted Properties shall be computed without cumulating the underlying indebtedness with any guarantee thereof or Lien securing the same.

(b) **Limitation on Sale and Leaseback Transactions**. So long as any of the Notes are outstanding, the Company will not itself, and will not permit any Principal Subsidiary to, enter into any Sale/Leaseback Transaction after the date of the Fiscal Agency Agreement unless, either:

(1) the Attributable Debt of the Company and its Principal Subsidiaries in respect of such Sale/Leaseback Transaction and all other Sale/Leaseback Transactions entered into after the date of the Fiscal Agency Agreement (other than such Sale/Leaseback Transactions as

are permitted by paragraph (2) below), plus the aggregate principal amount of External Indebtedness secured by Liens on Restricted Properties then outstanding (excluding any such External Indebtedness secured by Liens covered in paragraphs (1) through (5) in Condition 8(a)) without equally and ratably securing the Notes, would not exceed 15% of Net Tangible Assets; or

(2) the Company, within twelve months after such Sale/Leaseback Transaction, applies or causes a Principal Subsidiary, as the case may be, to apply an amount equal to the net proceeds of such sale or transfer of the Restricted Property which is the subject of such Sale/Leaseback Transaction to the retirement of External Indebtedness of the Company or a Principal Subsidiary, as the case may be, which is not subordinate to the Notes; provided that the amount to be so applied shall be reduced by (i) the principal amount of Notes delivered within twelve months after such Sale/Leaseback Transaction to the Fiscal Agent for retirement and cancellation, and (ii) the principal amount of External Indebtedness of the Company or a Principal Subsidiary, other than the Notes, voluntarily retired by the Company or a Principal Subsidiary within twelve months after such Sale/Leaseback Transaction. Notwithstanding the foregoing, no retirement referred to in this clause may be effected by payment at maturity or pursuant to any mandatory sinking fund payment or any mandatory prepayment provision.

Notwithstanding the foregoing, where the Company or any Principal Subsidiary is the lessee in any Sale/Leaseback Transaction, Attributable Debt shall not include any External Indebtedness resulting from the guarantee by the Company or any other Principal Subsidiary of the lessee's obligation thereunder. The restrictions in this Condition 8(b) shall not apply to any transaction between the Company and a Subsidiary or between a Principal Subsidiary and a Subsidiary.

(c) **Certain Definitions**. The following terms (except as otherwise expressly provided or unless the context otherwise clearly requires) for all purposes of the Fiscal Agency Agreement and the Notes shall have the respective meanings specified in this Condition. All accounting terms used herein and not expressly defined shall have the meanings given to them in accordance with K-IFRS, and the term "**K-IFRS**" shall mean International Financial Reporting Standards as adopted by Korea.

"**Attributable Debt**" means, with respect to any Sale/Leaseback Transaction, the lesser of (x) the fair market value of the Restricted Property subject to such transaction and (y) the present value (discounted at a rate per annum equal to the discount rate of a capital lease obligation with a like term in accordance with K-IFRS) of the obligations of the lessee for net rental payments (excluding amounts on account of maintenance and repairs, insurance, taxes, assessments and similar charges) during the term of the lease.

"**External Indebtedness**" means any obligation for the payment or repayment of money borrowed which is payable to a person other than a bank located in Korea, a governmental institution of Korea or a branch outside Korea of a bank incorporated in Korea.

"**Long-term Debt**" means any obligation for payment or repayment of money borrowed having a maturity of more than one year from the date such indebtedness was incurred or having a maturity of less than or equal to one year but by its terms being renewable or extendible, at the option of the borrower, beyond one year from the date such indebtedness was incurred.

"**Net Tangible Assets**" means, at any date, the total amount of assets of the Company and its consolidated Subsidiaries, including investments in unconsolidated Subsidiaries, after deducting therefrom (a) all current liabilities (excluding any current liabilities constituting Long-term Debt by reason of their being renewable or extendible at the option of the Company or the consolidated Subsidiary in question, as the case may be), (b) all goodwill, trade names, trademarks, patents, unamortized debt discount and expense and other like intangible assets, and (c) all write-ups of fixed assets, net of accumulated depreciation thereon, after December 31, 2021, other than as permitted by the laws of Korea applicable to the Company, all as set forth on the most recent balance sheet of the Company and its consolidated Subsidiaries and computed in accordance with K-IFRS.

"**person**" means any individual, corporation, partnership, joint venture, association, joint stock company, trust, unincorporated organization or government or any agency or political subdivision thereof.

"**Principal Subsidiary**" means:

(a) any Subsidiary of the Company under K-IFRS:

(i) whose revenue, as shown by the then latest audited accounts (consolidated where applicable) of such Subsidiary, constitute at least 10% of the consolidated revenue of the Company as shown by the then latest audited consolidated accounts of the Company; or

(ii) whose total assets, as shown by the then latest audited accounts (consolidated where applicable) of such Subsidiary, constitute at least 10% of the total consolidated assets of the Company as shown by the then latest audited consolidated accounts of the Company,

provided that:

(A) in the case of a Subsidiary acquired, or a company becoming a Subsidiary, after the end of the financial period to which the latest audited consolidated accounts of the Company relate, the reference to the then latest audited consolidated accounts of the Company for the purposes of the calculation above shall, until audited consolidated accounts of the Company for the financial period in which the acquisition is made or, as the case may be, in which the relevant company becomes a Subsidiary are published, be deemed to be a reference to the then latest audited consolidated accounts of the Company adjusted to consolidate the latest audited accounts (consolidated where applicable) of such Subsidiary in such accounts;

(B) if at any relevant time in relation to the Company or any Subsidiary in respect of which financial consolidation is relevant, no consolidated accounts are prepared and audited, revenue and total assets of the Company and/or any such Subsidiary shall be determined on the basis of pro forma consolidated accounts prepared for this purpose as of the date of the latest audited accounts of the Company by the auditors for the time being of the Company;

(C) if at any relevant time in relation to any Subsidiary no accounts are audited, its revenue and total assets (consolidated where applicable) shall be determined on the basis of pro forma accounts (consolidated where applicable) of the relevant Subsidiary prepared for this purpose as of the date of the latest audited accounts of the Company by the auditors for the time being of the Company; and

(D) if the accounts of any Subsidiary (not being a Subsidiary referred to in proviso (A) above) are not consolidated with those of the Company, then the determination of whether or not such a Subsidiary is a Principal Subsidiary shall be based on pro forma consolidation of its accounts (consolidated where applicable) with the then latest consolidated audited accounts (determined on the basis of the foregoing) of the Company; or

(b) any Subsidiary of the Company to which is transferred all or substantially all of the assets of a Subsidiary which immediately prior to such transfer was a Principal Subsidiary, provided that the Principal Subsidiary which so transfers its assets shall forthwith upon such transfer cease to be a Principal Subsidiary.

"**Restricted Property**" means (a) any facility, whether owned at the date of issuance of the Notes or thereafter acquired, used for the production of basic materials and chemicals, energy solutions, IT and electric materials and advanced materials or life sciences products of the Company or any Subsidiary, including any land, buildings, structures or machinery and other fixtures that constitute any such facility, or portion thereof, other than any such facility, or portion thereof, reasonably determined by the board of directors of the Company not to be of material importance to the total business conducted by the Company and its Subsidiaries as a whole, and (b) any share of common stock or participating preferred stock of a Principal Subsidiary.

"**Sale/Leaseback Transaction**" means any arrangement with any person which provides for the leasing by the Company or any Principal Subsidiary, for an initial term of three years or more, of any Restricted Property, whether owned at the date of issuance of the Notes or thereafter acquired, which is to be sold or transferred by the Company or any Principal Subsidiary after the date of issuance of the Notes to such person for a sale price of US$10,000,000 (or the equivalent thereof) or more where the rental payments are denominated in a currency other than the currency of Korea.

"**Subsidiary**" means any corporation or other entity of which securities or other ownership interests having ordinary voting power to elect a majority of the board of directors or other persons performing similar functions are at the time directly or indirectly owned by the Company.

(d) **Provision of Information to Holders**. The Company covenants that if, and for so long as, this Note is a "restricted security" within the meaning of Rule 144 under the United States Securities Act of 1933, as amended (the "**Securities Act**"), the Company shall, at any time when it is not subject to the periodic reporting requirements of Section 13 or Section 15(d) of the United States Securities Exchange Act of 1934, as amended (the "**Exchange Act**"), and is not exempt from such requirements pursuant to Rule 12g3-2(b) thereunder, provide to any Holder of this Note or prospective purchaser of this Note designated by such Holder, upon the request of such prospective purchaser or Holder, the information required to be provided by Rule 144A(d)(4) under the Securities Act.

9. Merger and Consolidation

Nothing contained in the Fiscal Agency Agreement or in the Notes shall prevent any consolidation of the Company with, or merger of the Company into, any other corporation or corporations (whether or not affiliated with the Company), or successive consolidations or mergers to which the Company or its successor or successors shall be a party or parties, or shall prevent any sale, transfer, lease or conveyance of the property of the Company as an entirety or substantially as an entirety; *provided* that (a) in case the Company shall consolidate with or merge into another corporation, or sell, transfer, lease or convey its property as an entirety or substantially as an entirety to any corporation, the corporation formed by such consolidation or into which the Company is merged or the corporation which acquires by sale, transfer, lease or conveyance the property of the Company as an entirety or substantially as an entirety shall be a corporation organized under the laws of Korea and shall expressly assume, if not assumed by law or by other means, by an agreement supplemental to the Fiscal Agency Agreement executed and delivered to the Fiscal Agent, the due and punctual payment of the principal of and interest on the Notes, and any Additional Amounts, according to their tenor, and the due and punctual performance and observance of all of the covenants and conditions of the Fiscal Agency Agreement and the Notes on the part of the Company to be performed or observed; (b) immediately after giving effect to such transaction and treating any indebtedness which becomes an obligation of the Company as a result of such transaction as having been incurred by the Company at the time of such transaction, no Event of Default (as defined below), and no event which, after notice or lapse of time or both, would become an Event of Default, shall have occurred and be continuing; (c) if, as a result of any such consolidation or merger or such sale, transfer, lease or conveyance, properties or assets of the Company or a Subsidiary would become subject to a Lien which would not be permitted by the Notes, the Company or such successor corporation, as the case may be, shall

take such steps as shall be necessary effectively to secure the Notes (together with, if the Company shall so determine, any other indebtedness of the Company or such Subsidiary then existing or thereafter created which is not subordinate to the Notes) equally and ratably with (or prior to) all indebtedness secured thereby; and (d) the Company has delivered to the Fiscal Agent an Officer's Certificate and an opinion of counsel as to matters of law stating that such consolidation, merger, sale, transfer, lease or conveyance and, if a supplemental agreement is required in connection with such transaction, such supplemental agreement comply with the Fiscal Agency Agreement and the Notes and that all conditions precedent herein provided for relating to such transaction have been complied with.

In case of any such consolidation, merger, sale, transfer, lease or conveyance, and following such an assumption by the successor corporation permitted under this Condition 9, such successor corporation shall succeed to and be substituted for the Company, with the same effect as if it had been named herein.

Such successor corporation may cause to be signed, and may issue either in its own name or in the name of the Company prior to such succession any or all of the Notes issuable hereunder which theretofore shall not have been signed by the Company and delivered to the Registrar; and, upon the order of such successor corporation, instead of the Company, and subject to all the terms, conditions and limitations in the Fiscal Agency Agreement prescribed, the Registrar shall authenticate and shall make available for delivery any Notes which previously shall have been signed and delivered by the officers of the Company to the Registrar for authentication, and any Notes which such successor corporation thereafter shall cause to be signed and delivered to the Registrar for that purpose. All of the Notes so issued shall in all respects have the same legal rank and benefit under the Fiscal Agency Agreement as the Notes theretofore or thereafter issued in accordance with the terms of the Fiscal Agency Agreement as though all of such Notes had been issued at the date of the execution hereof.

In case of any such consolidation, merger, sale, transfer, lease or conveyance such changes in phraseology and form (but not in substance) may be made in the Notes thereafter to be issued as may be appropriate.

In the event of any such sale, transfer or conveyance (other than a conveyance by way of lease) by the Company or any successor corporation which shall theretofore have become such successor corporation in the manner described in this Condition 9, the Company or such successor corporation, as the case may be, shall be discharged from all obligations and covenants under the Fiscal Agency Agreement and the Notes and may be liquidated and dissolved.

10. Events of Default

The term "**Event of Default**" means any of the following events (whatever the reason for such Event of Default and whether it shall be voluntary or involuntary or be effected by operation of law or pursuant to any judgment, decree or order of any court or any order, rule or regulation of any administrative or governmental body) which shall have occurred and be continuing:

(a) default in the payment of any installment of interest upon any of the Notes, whether at maturity, upon redemption or otherwise, as and when the same shall become due and payable, and continuance of such default for a period of 30 days; or

(b) default in the payment of all or any part of the principal of any of the Notes as and when the same shall become due and payable, whether at maturity, upon redemption or otherwise; or

(c) failure on the part of the Company duly to observe or perform any other of the covenants or agreements on the part of the Company contained in the Notes or in the Fiscal Agency Agreement for a period of 60 days after the date on which written notice specifying such failure, stating that such notice is a "**Notice of Default**" hereunder and demanding that the Company remedy the same, shall have been given to the Company by the Holders of at least 10% in aggregate principal amount of the Notes at the time outstanding; or

(d) any External Indebtedness of the Company in the aggregate outstanding principal amount of US$30,000,000 or more either (i) becoming due and payable prior to the due date for payment thereof by reason of acceleration thereof following default by the Company or (ii) not being repaid at, and remaining unpaid after, maturity as extended by the period of grace, if any, applicable thereto, or any guarantee given by the Company in respect of External Indebtedness of any other person in the aggregate principal amount of US$30,000,000 or more not being honored when, and remaining dishonored after becoming, due and called, provided that, in the case of (i) above, if any such default under any such External Indebtedness shall be cured or waived, then the default hereunder by reason thereof shall be deemed to have been cured and waived; or

(e) a court or administrative or other governmental agency or body having jurisdiction in the premises shall enter a decree or order for relief in respect of the Company in an involuntary case under any applicable bankruptcy, insolvency, reorganization, compulsory composition or other similar law now or hereafter in effect, or appointing a receiver, liquidator, assignee, custodian, trustee, sequestrator (or similar official) of the Company or for any substantial part of its property or ordering the winding up, dissolution or liquidation of its affairs, or shall otherwise adjudicate or find the Company to be bankrupt or insolvent and such decree or order shall remain unstayed and in effect for a period of 60 consecutive days; or

(f) the Company shall commence a voluntary case under any applicable bankruptcy, insolvency, reorganization, compulsory composition or other similar law now or hereafter in effect, or consent to the entry of an order for relief in an involuntary case under any such law, or consent to the appointment or taking possession by a receiver, liquidator, assignee, custodian, trustee, sequestrator or similar official of the Company or for any substantial part of its property, or cease to carry on the whole or substantially the whole of its business (except as provided in Condition 9) or make any general assignment for the benefit of creditors, or enter into any composition with its creditors, or take corporate action in furtherance of any such action.

If such Event of Default is continuing, the Holders of 25% or more in aggregate principal amount of the Notes then outstanding may, by written demand to the Company at the office of the Fiscal Agent, declare all of the Notes then outstanding to be immediately due and payable. Upon such declaration, the Fiscal Agent shall give notice thereof to the Company and to the Holders of the Notes, by mail and publication. If, after any such declaration and before any judgment or decree for the payment of the monies due shall have been obtained or entered, the Company pays or deposits with the Fiscal Agent all amounts then due with respect to the Notes (other than amounts due solely because of such declaration) and cures all other Events of Default with respect to the Notes, such defaults may be waived and such declaration may be annulled and rescinded by the Holders of more than 50% in aggregate principal amount of the Notes then outstanding, by written notice thereof to the Company at the office of the Fiscal Agent.

11. Meetings of Holders; Modifications and Amendments

(a) The Company may at any time, and the Fiscal Agent shall at any time after the Notes shall have become immediately due and payable due to a default upon a request in writing made by Holders holding not less than 10% of the aggregate outstanding principal amount of the Notes, convene a meeting of Holders of the Notes. Any such request in writing by the Holders shall be delivered to the Fiscal Agent. Further provisions concerning meetings of the Holders are set forth in the Fiscal Agency Agreement.

(b) Modifications and amendments to the Fiscal Agency Agreement or the Notes requiring consent of Holders may be made, and future compliance therewith or past defaults by the Company may be waived, with the consent of the Company and the Holders of more than 50% in aggregate principal amount of the Notes at the time outstanding, or of such lesser percentage as may act at a meeting of Holders held in accordance with the provisions of the Fiscal Agency Agreement; *provided* that no such modification, amendment or waiver of the Fiscal Agency Agreement or any Note may, without the consent of each Holder affected thereby, (i) change the stated

maturity of the principal of, or date for the payment of interest on, any such Note; (ii) reduce the principal of or interest on any such Note; (iii) change the currency of payment of the principal of or interest on any such Note; or (iv) reduce the above-stated percentage of aggregate principal amount of Notes outstanding or reduce the quorum requirements or the percentage of votes required for the taking of any action. Any modifications, amendments or waivers consented to or approved at a meeting will be conclusive and binding on all Holders of Notes whether or not they have given such consent or were present at such meeting, and on all future Holders of Notes whether or not notation of such modifications, amendments or waivers is made upon the Notes. Any instrument given by or on behalf of any Holder of a Note in connection with any consent to any such modification, amendment or waiver will be irrevocable once given and will be conclusive and binding on all subsequent Holders of such Note.

(c) At a meeting of the Holders of the Notes called for any of the above purposes, persons entitled to vote a majority in aggregate principal amount of the Notes at the time outstanding shall constitute a quorum. In the absence of a quorum at any such meeting, the meeting may be adjourned for a period of not less than ten days; in the absence of a quorum at any such adjourned meeting, such adjourned meeting may be further adjourned for a period of not less than ten days; at the reconvening of any meeting further adjourned for lack of a quorum, the persons entitled to vote 25% in aggregate principal amount of the Notes at the time outstanding shall constitute a quorum for the taking of any action set forth in the notice of the original meeting. At a meeting or an adjourned meeting duly convened and at which a quorum is present as aforesaid, any resolution to modify or amend, or to waive compliance with, any of the covenants or conditions referred to above (other than those set forth in paragraphs (i) through (iv) of Condition 11(b) hereof) shall be effectively passed if passed by the persons entitled to vote the lesser of (i) a majority in aggregate principal amount of Notes then outstanding or (ii) 75% in aggregate principal amount of the Notes represented and voting at the meeting.

(d) The Fiscal Agency Agreement and the terms and conditions of the Notes may be modified, supplemented or amended, without the consent of the Holder of any Note, for the purposes of (i) adding to the covenants of the Company for the benefit of the Holders; (ii) surrendering any right or power conferred upon the Company; (iii) securing the Notes; (iv) curing any ambiguity, correcting or supplementing any defective provision herein; (v) evidencing the succession of another corporation to the Company and the assumption by it of the covenants, agreements and obligations of the Company under the Fiscal Agency Agreement and in, or with respect to, the Notes; (vi) adding any additional events of default, *provided* that any such additional event of default would not cause any Notes to be in default immediately upon any such addition; (vii) evidencing and providing for the acceptance of appointment of a successor Fiscal Agent with respect to the Notes and to add to or change any provisions of the Fiscal Agency Agreement that shall be necessary to provide for or facilitate the administration by more than one Fiscal Agent; or (viii) in regard to such matters or questions as the Company may deem necessary or desirable, *provided* that such action shall in the opinion of the Company not adversely affect in any material respect the interests of the Holders of the Notes at the time outstanding. Any determination as to adverse effect on the interests of the Holders pursuant to these Conditions shall be made by the Company and none of the Fiscal Agent, the Registrar or the Transfer Agent shall have any responsibility or liability whatsoever with respect to such determination. In all other cases, amendment of the Fiscal Agency Agreement will require consent of the Holders pursuant to a resolution of the Holders of the Notes adopted pursuant to Section 14 of the Fiscal Agency Agreement and the Notes.

12. Notices to Holders

Except as otherwise expressly provided herein or the Fiscal Agency Agreement, whenever the Fiscal Agency Agreement or a Note requires that the Company give notice to the Holder hereof, the Company will cause such notice to be mailed to the Holders of Notes at their respective addresses as they appear in the Note Register. If by reason of the suspension of regular mail service, or by reason of any other cause, it shall be impracticable to give notice to the Holders of Notes in the manner prescribed herein, then such notification in lieu thereof as shall be made by the Company shall constitute sufficient provision of such notice, if such notification shall, so far as may be practicable, approximate the terms and conditions of the notice in lieu of which it is given. Neither the failure to give notice nor any defect in any notice given to any particular Holder of a Note shall affect the sufficiency of any notice with respect to other Notes.

So long as the Notes are represented by Global Notes and the Global Notes are held on behalf of DTC, Euroclear, Clearstream or an alternative clearing system appointed in accordance with the terms of the Notes and the Fiscal Agency Agreement, notices to Holders may be given by delivery of the relevant notice to the clearing systems in accordance with the applicable rules and procedures of the clearing systems for communication by them to entitled accountholders. Any such notice shall be deemed validly given on the day after it has been delivered to DTC, Euroclear, Clearstream or an alternative clearing system as aforesaid.

13. Valid Obligations

The Company hereby certifies and declares that all acts, conditions and things required to be done and performed and to have happened precedent to the creation and issuance of this Note, and to constitute the same the valid and legally binding obligation of the Company enforceable in accordance with its terms, have been done and performed and have happened in due and strict compliance with the applicable laws of the State of New York.

14. Governing Law

The Notes shall be governed by, and interpreted in accordance with, the laws of the State of New York.

The Company (a) agrees that any legal suit, action or proceeding arising out of or based upon these terms and conditions may be instituted in any state or federal court in the Borough of Manhattan, the State and City of New York, United States of America; (b) waives, to the extent it may effectively do so and to the extent permitted by applicable law, any objection which it may have now or hereafter to the laying of the venue of any such suit, action or proceeding, and waives any right to trial by jury; and (c) irrevocably submits to the jurisdiction of any such court in any such suit, action or proceeding. The Company hereby designates Capitol Services, Inc., as the Company's authorized agent to accept and acknowledge on its behalf service of any and all process which may be served in any such suit, action or proceeding in any such court and agrees that service of process upon said agent at its office at 1218 Central Avenue, Suite 100, Albany, NY 12205, USA (or at such other address as such agent may designate by written notice to the Company and the Fiscal Agent), and written notice of said service to the Company, mailed or delivered to it, at LG Twin Towers, 128, Yeoui-daero, Yeongdeungpo-gu, Seoul 07336, Korea, Attention: Finance Team, shall be deemed in every respect effective service of process upon the Company in any such suit, action or proceeding and shall be taken and held to be valid personal service upon the Company, whether or not the Company shall then be doing, or at any time shall have done, business within the State of New York, and that any such service of process shall be of the same force and validity as if service were made upon it according to the laws governing the validity and requirements of such service in such State, and to the extent permitted by applicable law, waives all claim of error by reason of any such service. Neither such appointment nor such acceptance of jurisdiction shall be interpreted to include actions brought under the United States federal securities laws. If for any reason such agent shall cease to be such agent for the service of process, the Company shall forthwith appoint a new agent for service of process in New York and deliver to the Fiscal Agent a copy of the new agent's acceptance of that appointment within 30 days.

CLEARANCE AND SETTLEMENT

We have obtained the information in this section from sources we believe to be reliable, including from DTC, Euroclear and Clearstream. We accept responsibility only for accurately extracting information from such sources. DTC, Euroclear and Clearstream are under no obligation to perform or continue to perform the procedures described below, and they may modify or discontinue them at any time. Neither we nor the registrar will be responsible for DTC's, Euroclear's or Clearstream's performance of their obligations under their rules and procedures, or for the performance by their direct or indirect participants of obligations under their rules and procedures.

Introduction

The Depository Trust Company

DTC is:

- a limited-purpose trust company organized under the New York Banking Law;
- a "banking organization" under the New York Banking Law;
- a member of the Federal Reserve System;
- a "clearing corporation" under the New York Uniform Commercial Code; and
- a "clearing agency" registered under Section 17A of the U.S. Securities Exchange Act of 1934, as amended (the "Exchange Act").

DTC was created to hold securities for its participants and to facilitate the clearance and settlement of securities transactions between its participants. It does this through electronic book-entry changes in the accounts of its direct participants, eliminating the need for physical movement of securities certificates. DTC is owned by a number of its direct participants and by the New York Stock Exchange Inc., the American Stock Exchange, Inc. and the National Association of Securities Dealers Inc.

Euroclear and Clearstream

Like DTC, Euroclear and Clearstream hold securities for their participants and facilitate the clearance and settlement of securities transactions between their participants through electronic book-entry changes in their accounts. Euroclear and Clearstream provide various services to their participants, including the safekeeping, administration, clearance and settlement and lending and borrowing of internationally traded securities. Participants in Euroclear and Clearstream are financial institutions such as underwriters, securities brokers and dealers, banks and trust companies. Other banks, brokers, dealers and trust companies have indirect access to Euroclear or Clearstream by clearing through or maintaining a custodial relationship with a Euroclear or Clearstream participant.

Ownership of the Notes through DTC, Euroclear and Clearstream

We will issue the Notes in the form of one or more fully registered global notes, registered in the name of a nominee of DTC. Financial institutions, acting as direct and indirect participants in DTC, will represent your beneficial interests in the global notes. These financial institutions will record the ownership and transfer of your beneficial interests through book-entry accounts. You may hold your beneficial interests in the global notes through DTC, if you are a participant in DTC, or indirectly through organizations that are participants in DTC. Euroclear and Clearstream will hold their participants' beneficial interests in the global notes in their customers' securities accounts with their depositaries. These depositaries of Euroclear and Clearstream, in turn, will hold such interests in their customers' securities accounts with DTC.

We and the Fiscal Agent generally will treat the registered holder, initially Cede & Co., as the absolute owner of the Notes for all purposes. Once we and the Fiscal Agent make payments to the registered holder, we and the Fiscal Agent will no longer be liable on the Notes for the amounts so paid. Accordingly, if you own a beneficial interest in the global notes, you must rely on the procedures of the institutions through which you hold your interests in the Notes, including DTC, Euroclear, Clearstream and their respective participants, to exercise any of the rights granted to holders of such Notes. Under existing industry practice, if you desire to take any action that Cede & Co., as the holder of the global notes, is entitled to take, then Cede & Co. would authorize the DTC participant through which you own your beneficial interest to take such action. The DTC participant would then either authorize you to take the action or act for you on your instructions.

DTC may grant proxies or authorize its participants, or persons holding beneficial interests in the Notes through such participants, to exercise any rights of a holder or take any actions that a holder is entitled to take under the fiscal agency agreement or the Notes.

Euroclear's or Clearstream's ability to take actions as holder under the Notes or the fiscal agency agreement will be limited by the ability of their respective depositaries to carry out such actions for them through DTC. Euroclear and Clearstream will take such actions only in accordance with their respective rules and procedures.

The fiscal agent will not charge you any fees for the Notes, other than reasonable fees and indemnity satisfactory to the fiscal agent for the replacement of lost, stolen, mutilated or destroyed Notes. However, you may incur fees for the maintenance and operation of the book-entry accounts with the clearing systems in which your beneficial interests are held.

Transfers Within and Between DTC, Euroclear and Clearstream

Trading Between DTC Purchasers and Sellers

DTC participants will transfer interests in the Notes among themselves in the ordinary way according to DTC rules. DTC participants will pay for such transfers by wire transfer. The laws of some states require certain purchasers of securities to take physical delivery of the securities in definitive form. These laws may impair your ability to transfer beneficial interests in the global notes to such purchasers. DTC can act only on behalf of its direct participants, who, in turn, act on behalf of indirect participants and certain banks. Thus, your ability to pledge a beneficial interest in the global notes to persons that do not participate in the system, and to take other actions, may be limited because you will not possess a physical certificate that represents your interest.

Trading Between Euroclear or Clearstream Participants

Euroclear or Clearstream participants will transfer interests in the Notes among themselves according to the rules and operating procedures of Euroclear and Clearstream.

Trading Between a DTC Seller and a Euroclear or Clearstream Purchaser

When the Notes are to be transferred from the account of a DTC participant to the account of a Euroclear or Clearstream participant, the purchaser must first send instructions to Euroclear or Clearstream through a participant at least one business day prior to the settlement date. Euroclear or Clearstream will then instruct its depositary to receive the Notes and make payment for them. On the settlement date, the depositary will make payment to the DTC participant's account, and the Notes will be credited to the depositary's account. After settlement has been completed, DTC will credit the Notes to Euroclear or Clearstream, Euroclear or Clearstream will credit the Notes, in accordance with its usual procedures, to its participant's account, and the participant will then credit the purchaser's account. These securities credits will appear the next day (European time) after the settlement date. The cash debit from the account of Euroclear or Clearstream will be back-valued to the value date, which will be the preceding day if settlement occurs in New York. If settlement is not completed on the intended value date (i.e., the trade fails), the cash debit will instead be valued at the actual settlement date.

Participants in Euroclear and Clearstream will need to make funds available to Euroclear or Clearstream to pay for the Notes by wire transfer on the value date. The most direct way of doing this is to pre-position funds (i.e., have funds in place at Euroclear or Clearstream before the value date), either from cash on hand or existing lines of credit. Under this approach, however, participants may take on credit exposure to Euroclear and Clearstream until the Notes are credited to their accounts one day later.

As an alternative, if Euroclear or Clearstream has extended a line of credit to a participant, the participant may decide not to pre-position funds, but to allow Euroclear or Clearstream to draw on the line of credit to finance settlement for the Notes. Under this procedure, Euroclear or Clearstream would charge the participant overdraft charges for one day, assuming that the overdraft would be cleared when the Notes were credited to the participant's account. However, interest on such Notes would accrue from the value date. Therefore, in many cases the interest income on the Notes which the participant earns during that one-day period will substantially reduce or offset the amount of the participant's overdraft charges. Of course, this result will depend on the cost of funds (i.e., the interest rate that Euroclear or Clearstream charges) to each participant.

Since the settlement will occur during New York business hours, a DTC participant selling an interest in the Notes can use its usual procedures for transferring global securities to the depositories of Euroclear or Clearstream for the benefit of Euroclear or Clearstream participants. The DTC seller will receive the sale proceeds on the settlement date. Thus, to the DTC seller, a cross-market sale will settle no differently than a trade between two DTC participants.

Trading Between a Euroclear or Clearstream Seller and a DTC Purchaser

Due to time-zone differences in their favor, Euroclear and Clearstream participants can use their usual procedures to transfer Notes through their depositaries to a DTC participant. The seller must first send instructions to Euroclear or Clearstream through a participant at least one business day prior to the settlement date. Euroclear or Clearstream will then instruct its depositary to credit the Notes to the DTC participant's account and receive payment. The payment will be credited in the account of the Euroclear or Clearstream participant on the following day, but the receipt of the cash proceeds will be back-valued to the value date, which will be the preceding day if settlement occurs in New York. If settlement is not completed on the intended value date (i.e., the trade fails), the receipt of the cash proceeds will instead be valued at the actual settlement date.

If the Euroclear or Clearstream participant selling the Notes has a line of credit with Euroclear or Clearstream and elects to be in debit for the Notes until it receives the sale proceeds in its account, then the back-valuation may substantially reduce or offset any overdraft charges that the participant incurs over that period.

Settlement in other currencies between DTC and Euroclear and Clearstream is possible using free-of-payment transfers to move the Notes, but funds movement will take place separately.

TAXATION

The following summary is based upon the tax laws of Korea and the United States as in effect on the date of this offering circular, and is subject to any change in the tax laws of Korea or the United States that may come into effect after such date. This summary does not purport to be a legal opinion or to address all tax aspects that may be relevant to a holder of the Notes. Investors in the Notes are advised to consult their own tax advisers as to the tax consequences under the tax laws of Korea or the United States or any other consequences of the purchase, ownership and disposition of the Notes, including the effect of any national, state or local tax laws.

Korean Taxation

The taxation of non-resident individuals and non-resident corporations ("Non-Residents") depends on whether they have a "permanent establishment" (as defined under Korean law and applicable tax treaty) in Korea to which the relevant Korean source income is attributable or with which such income is effectively connected. Non-Residents without a permanent establishment in Korea are taxed in the manner described below. Non-Residents with permanent establishments in Korea are taxed in accordance with different rules.

Tax on Interest

Interest on the Notes paid to Non-Residents, being foreign currency-denominated bonds issued outside of Korea, is exempt from income tax and corporation tax (whether payable by withholding or otherwise) pursuant to the Special Tax Treatment Control Law (the "STTCL").

If the tax exemption under the STTCL referred to above were to cease to be in effect, the rate of income tax or corporation tax applicable to interest on the Notes, for a Non-Resident without a permanent establishment in Korea, would be 14% of income. In addition, a tax surcharge called a local income tax would be imposed at the rate of 10% of the income or corporation tax (raising the total tax rate to 15.4%).

The tax rates may be reduced by an applicable tax treaty, convention or agreement between Korea and the country of the recipient of the income.

In order to obtain the benefit of a reduced rate available under applicable tax treaties, a Non-Resident holder must submit an application for reduced rate to the party liable for the withholding before the receipt of the relevant interest payment (if there is no change in the contents of such application, it is not required to submit such application again within three years thereafter), together with a certificate of the Non-Resident holder's tax residence issued by a competent authority of the Non-Resident's resident country under certain circumstances. If the Non-Resident holder was unable to receive the benefit of a reduced rate due to his or her failure to timely submit the aforementioned application, the Non-Resident holder may still receive a tax treaty benefit by submitting evidentiary documents to the relevant tax office within five years thereafter. If interest is paid to an overseas investment vehicle, the overseas investment vehicle (subject to certain exceptions) must submit a report of overseas investment vehicle and a schedule of beneficial owners. The foregoing matter is discussed in more detail below.

Tax on Capital Gains

Korean tax laws currently exclude from Korean taxation gains made by a Non-Resident without a permanent establishment in Korea from the sale of the Notes to Non-Residents (other than to their permanent establishments in Korea). In addition, capital gains earned by Non-Residents with or without permanent establishments in Korea from the transfer taking place outside Korea of the Notes are currently exempt from taxation by virtue of STTCL, provided that the issuance of the Notes is deemed to be an overseas issuance under the STTCL.

If the exclusion or exemption from Korean taxation referred to above were to cease to be in effect, in the absence of an applicable treaty reducing or eliminating tax on capital gains, the applicable rate of tax would be the lower of 11% (including local income tax) of the gross realization proceeds and (subject to the production of satisfactory evidence of the acquisition cost and certain direct transaction costs of the relevant Note) 22% (including local income tax) of the realized gain (i.e., the excess of the gross realization proceeds over the acquisition cost and certain direct transaction costs) made. If such evidence shows that no gain (or a loss) was made on the sale, no Korean tax is payable. There is no provision under relevant Korean law for offsetting gains and losses or otherwise aggregating transactions for the purpose of computing the net gain attributable to sales of Notes issued by Korean companies. The purchaser or any other designated withholding agent of Notes is obliged under Korean law to withhold the applicable amount of Korean tax and make payment thereof to the relevant Korean tax authority. Unless the seller can claim the benefit of an exemption from tax under an applicable tax treaty, or upon the failure of the seller to produce satisfactory evidence of his acquisition cost and certain direct transaction costs in relation to the instruments being sold, the purchaser or such withholding agent must withhold an amount equal to 11% of the gross realization proceeds. Any amounts withheld by the purchaser or withholding agent must be paid to the competent Korean tax office. The purchaser or withholding agent must pay any withholding tax no later than the tenth day of the month following the month in which the payment for the purchase of the relevant instruments occurred. Failure to transmit the withheld tax to the Korean tax authorities in time may subject the purchaser or the withholding agent to penalties under Korean tax laws. The Korean tax authorities may attempt to collect such tax from a Non-Resident who is liable for payment of any Korean tax on gains, as a purchaser or withholding agent who is obliged to withhold such tax, through proceedings against payments due to the Non-Resident from its Korean investments and the assets or revenues of any of the Non-Resident's branch or representative offices in Korea.

Inheritance Tax and Gift Tax

Korean inheritance tax is imposed upon (a) all assets (wherever located) of the deceased if at the time of his death he was domiciled in Korea or had resided in Korea continuously for at least 183 days immediately prior to his death and (b) all property located in Korea which passes on death (irrespective of the domicile or residence of the deceased). Gift tax is imposed in similar circumstances to the above. The taxes are imposed if the value of the relevant property is above a certain limit and the rate varies from 10% to 50% according to the value of the relevant property and the identity of the persons involved. At present, Korea has not entered into any tax treaties regarding its inheritance or gift taxes.

Under Korean inheritance and gift tax laws, bonds issued by Korean corporations are deemed located in Korea irrespective of where they are physically located or by whom they are owned. And, consequently, the Korean inheritance and gift taxes will be imposed on transfers of the Notes by inheritance or gift. Holders should consult their personal tax advisers regarding the consequences of the imposition of the Korean inheritance or gift tax.

Stamp Duty and Notes Transaction Tax

No stamp, issue or registration duties will be payable in Korea by the Holders in connection with the issue of the Notes except for a nominal amount of stamp duty on certain documents executed in Korea which will be paid by us. No securities transaction tax will be imposed upon the transfer of the Notes.

Tax Treaties

At the date of this offering circular, Korea has tax treaties with, inter alia, Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, The Netherlands, New Zealand, Norway, Singapore, Sweden, Switzerland, the United Kingdom and the United States of America under which the rate of withholding tax on interest is reduced, generally to between 5 and 16.5% (including local income tax), and the tax on capital gains is often eliminated.

Each Holder should inquire whether he is entitled to the benefit of a tax treaty with respect to any transaction involving the Notes. It is the responsibility of the party claiming the benefits of a tax treaty in respect of interest payments to file with the payer or us a certificate as to his residence. In the absence of sufficient proof, the payer or we must withhold taxes in accordance with the above discussion.

In order to claim the benefit of a tax rate reduction or tax exemption available under the applicable tax treaties, a non-resident holder should submit to the payer of such Korean source income an application (for a reduced withholding tax rate, the "application for entitlement to reduced tax rate," and for an exemption from withholding tax, the "application for exemption" under a tax treaty along with a certificate of the non-resident holder's tax residence issued by a competent authority of the non-resident holder's residence country) as the beneficial owner of such Korean source income ("BO Application"). Such application should be submitted to the withholding agent prior to the payment date of the relevant income. Subject to certain exceptions, where the relevant income is paid to an overseas investment vehicle (which is not the beneficial owner of such income) ("OIV"), a beneficial owner claiming the benefit of an applicable tax treaty with respect to such income must submit its BO Application to such OIV, which must submit an OIV report and a schedule of beneficial owners to the withholding agent prior to the payment date of such income. In the case of a tax exemption application, the withholding agent is required to submit such application (together with the applicable OIV report in the case of income paid to an OIV) to the relevant district tax office by the ninth day of the month following the date of the payment of such income.

Withholding and Gross Up

As mentioned above, interest on the Notes is exempt from any withholding or deduction on account of income tax or corporation tax pursuant to STTCL. However, in the event that the payer or we are required by law to make any withholding or deduction for or on account of any Korean taxes (as more fully described in "Terms and Conditions of the Notes – Additional Amounts") we have agreed to pay (subject to the customary exceptions as set out in "Terms and Conditions of the Notes – Additional Amounts") such Additional Amounts as may be necessary in order that the net amounts received by the Holder of any Note after such withholding or deduction shall equal the respective amounts which would have been received by such Holder in the absence of such withholding or deduction.

U.S. Taxation

The following summary describes certain U.S. federal income tax considerations with respect to the purchase, ownership and disposition of Notes by a U.S. Holder (as defined below) as of the date of this offering circular. The discussion below is based upon the provisions of the Internal Revenue Code of 1986, as amended (the "Code"), and regulations, rulings and judicial decisions thereunder as of the date hereof, and such authorities may be repealed, revoked or modified, possibly with retroactive effect, so as to result in U.S. federal income tax consequences different from those discussed below. The summary does not purport to be a comprehensive description of all of the tax considerations that may be relevant to any particular investor, including tax considerations that arise from rules of general application to all taxpayers or to certain classes of investors or that are generally assumed to be known by investors. The discussion set forth below deals only with Notes purchased at their original issuance and issue price and held as capital assets. It does not address tax considerations applicable to investors that may be subject to special tax rules, such as dealers in securities or currencies, short-term holders of the Notes, financial institutions, tax-exempt entities, insurance companies, regulated investment companies, real estate investment trusts, persons liable for alternative minimum tax, U.S. expatriates, partnerships and other pass-through entities for U.S. federal income tax purposes and partners or other investors therein, persons holding Notes as a part of a hedging, integrated, conversion or constructive sale transaction or a straddle, traders in securities that elect to use a mark-to-market method of accounting for their securities holdings or investors whose "functional currency" is not the U.S. dollar. In addition, this discussion does not consider the effect of any applicable state, local or foreign tax laws, the Medicare tax on net investment income, the special timing rules prescribed under section 451(b) of the Code, or any aspect of U.S. federal taxation other than income taxation (such as estate and gift tax laws).

As used herein, a "U.S. Holder" means a beneficial owner of a Note that is, for U.S. federal income tax purposes, an individual who is a citizen or resident of the United States, a corporation created or organized in or under the laws of the United States or any political subdivision thereof, or any other person that is subject to U.S. federal income tax on a net income basis in respect of its investment in the Notes.

Investors should consult their own tax advisors regarding the tax consequences of the acquisition, ownership and disposition of the Notes, including the application to their particular circumstances of the U.S. federal income tax considerations discussed below, as well as the application of U.S. state and local tax laws and non-U.S. tax laws.

Payment of Stated Interest

Payments of stated interest on a Note, including the amount of any tax withheld therefrom and any additional amounts paid in respect of such withholding, generally will be taxable to a U.S. Holder as ordinary income at the time it is paid or accrued in accordance with the U.S. Holder's method of accounting for U.S. federal income tax purposes. It is expected, and this discussion assumes, that the Notes will be issued without original issue discount ("OID") for U.S. federal income tax purposes. In general, however, if a series of Notes is issued with OID at or above a *de minimis* threshold, a U.S. holder of that series of Notes will be required to include OID in gross income, as ordinary income, under a "constant-yield method" before the receipt of cash attributable to such income, regardless of the U.S. holder's regular method of accounting for U.S. federal income tax purposes.

Subject to generally applicable limitations and conditions, Korean interest withholding tax paid at the appropriate rate applicable to a U.S. Holder may be eligible for credit against such U.S. Holder's U.S. federal income tax liability. (See the discussion above under "– Korean Taxation.") These generally applicable limitations and conditions include new requirements recently adopted by the U.S. Internal Revenue Service ("IRS"), and any Korean tax will need to satisfy these requirements in order to be eligible to be a creditable tax for a U.S. Holder. In the case of a U.S. holder that is eligible for, and properly elects, the benefits of the income tax treaty between the United States and the Republic of Korea (the "Treaty"), the Korean tax on interest may be treated as meeting the new requirements and therefore as a creditable tax. The application of these requirements to the Korean tax on interest is uncertain, and we have not determined whether these requirements have been met, including requirements applicable to creditability under the Treaty. If the Korean interest tax is not a creditable tax or the U.S. Holder does not elect to claim a foreign tax credit for any foreign income taxes, the U.S. Holder may be able to deduct the Korean tax in computing such U.S. Holder's taxable income for U.S. federal income tax purposes. Interest and additional amounts will constitute income from sources without the United States and, if the withholding tax is a creditable tax for a U.S. Holder that elects to claim foreign tax credits, generally will constitute "passive category income" for purposes of the foreign tax credit.

The availability and calculation of foreign tax credits and deductions for foreign taxes depend on a U.S. Holder's particular circumstances and involve the application of complex rules to those circumstances. U.S. Holders should consult their own tax advisors regarding the application of these rules to their particular situations.

Sale, Exchange and Retirement of Notes

Upon the sale, exchange or retirement of a Note, a U.S. Holder generally will recognize a gain or loss equal to the difference between the amount realized on the sale, exchange or retirement (less any accrued interest, which will be taxable as such) and the U.S. Holder's tax basis in such Note. A U.S. Holder's adjusted tax basis in a Note generally will be the purchase price of that Note on the date of purchase. Gain or loss realized by a U.S. Holder on a sale or other taxable disposition of a Note generally will be capital gain or loss and will be long-term capital gain or loss if, at the time of such sale or disposition, the Notes have been held for more than one year. Certain non-corporate U.S. Holders (including individuals) may be eligible for preferential rates of taxation in respect of long-term capital gains. The deductibility of capital losses is subject to limitations.

Capital gain or loss recognized by a U.S. Holder on the sale, exchange or retirement of the Notes generally will be U.S. source gain or loss for U.S. foreign tax credit purposes. Under the new foreign tax credit requirements recently adopted by the IRS, any Korean tax imposed on the sale, exchange or retirement of the Notes generally will not be treated as a creditable tax for U.S. foreign tax credit purposes. If the Korean tax is not a creditable tax, the tax would reduce the amount realized on the sale, exchange or retirement of the Notes even if the U.S. Holder has elected to claim a foreign tax credit for other taxes in the same year. U.S. Holders should consult their own tax advisors regarding the application of the foreign tax credit rules to a sale, exchange or retirement of the Notes and any Korean tax imposed on such sale, exchange or retirement.

Foreign Financial Assets Reporting

Certain U.S. Holders that own "specified foreign financial assets" with an aggregate value in excess of U.S.$50,000 on the last day of the taxable year or U.S.$75,000 at any time during the taxable year are generally required to file an information statement along with their tax returns, currently on Form 8938, with respect to such assets. "Specified foreign financial assets" include any financial accounts held at a non-U.S. financial institution, as well as securities issued by a non-U.S. issuer (which would include the Notes) that are not held in accounts maintained by financial institutions. Higher reporting thresholds apply to certain individuals living abroad and to certain married individuals. Regulations extend this reporting requirement to certain entities that are treated as formed or availed of to hold direct or indirect interests in specified foreign financial assets based on certain objective criteria. U.S. Holders that fail to report the required information could be subject to substantial penalties. In addition, the statute of limitations for assessment of tax would be suspended, in whole or part. Prospective investors should consult their own tax advisors concerning the application of these rules to their investment in the Notes, including the application of the rules to their particular circumstances.

Information Reporting and Backup Withholding

Payments in respect of the Notes (including the proceeds of a disposition of a Note) that are paid within the United States or through certain U.S.-related financial intermediaries are generally subject to information reporting, unless the Holder is an exempt recipient. Payments to a U.S. Holder that is not an exempt recipient may also be subject to backup withholding, unless the U.S. Holder provides an accurate taxpayer identification number and certifies that it has not lost its exemption from backup withholding. A Holder that is a foreign corporation or a nonresident alien individual may be required to comply with certification and identification procedures in order to establish an exemption from information reporting and backup withholding. The amount of any backup withholding collected from a payment to a Holder will be allowed as a credit against the Holder's U.S. federal income tax liability and may entitle the Holder to a refund, provided that certain required information is timely furnished to the IRS. Holders should consult their tax advisors about these rules and any other reporting obligations that may apply to the ownership or disposition of Notes.

PLAN OF DISTRIBUTION

Under the terms and conditions contained in a purchase agreement dated July , 2022 (the "Purchase Agreement"), we have agreed to sell to BNP Paribas, Citigroup Global Markets Inc., The Hongkong and Shanghai Banking Corporation Limited, The Korea Development Bank, Merrill Lynch International and Standard Chartered Bank (together, the "Initial Purchasers"), the following principal amounts of the Notes.

Initial Purchasers	Principal Amount of the Notes
BNP Paribas	U.S.$
Citigroup Global Markets Inc	
The Hongkong and Shanghai Banking Corporation Limited	
The Korea Development Bank	
Merrill Lynch International	
Standard Chartered Bank	
Total	U.S.$

The Purchase Agreement provides that the Initial Purchasers are obligated to purchase all of the Notes, if any are purchased. Each of the Initial Purchasers proposes to offer the Notes initially at the offering price on the cover page of this offering circular. After the initial offering, the offering price may be changed.

We have agreed to indemnify each of the Initial Purchasers against certain liabilities, including liabilities under the Securities Act, or to contribute to the amount the Initial Purchasers may be required to make in respect of those liabilities.

The Initial Purchasers are offering the Notes, subject to prior sale, when, as and if issued to and accepted by them, subject to approval of legal matters by their counsel, including the validity of the Notes, and other conditions contained in the Purchase Agreement, such as the receipt by the Initial Purchasers of officer's certificates and legal opinions. The Initial Purchasers reserve the right to withdraw, cancel or modify offers to investors and to reject orders in whole or in part.

If a jurisdiction requires that the offering of the Notes be made by a licensed broker or dealer and any Initial Purchaser or any affiliate of an Initial Purchaser is a licensed broker or dealer in that jurisdiction, the offering of any of the Notes shall be deemed to be made by such Initial Purchaser or such affiliate on behalf of us in such jurisdiction.

New Issue of Notes

The Notes are a new issue of securities with no established trading market. The Initial Purchasers have advised that they presently intend to make a market in the Notes after completion of the offering. However, they are under no obligation to do so and may discontinue any market-making activities at any time without any notice. We cannot assure the liquidity of the trading market for the Notes. If an active trading market for the Notes does not develop, the market price and liquidity of the Notes may be adversely affected. If the Notes are traded, they may trade at a discount from their initial offering price, depending on prevailing interest rates, the market for similar securities, our operating performance and financial condition, general economic conditions and other factors.

Settlement

Delivery of the Notes is expected on or about , 2022.

No Sales of Similar Securities

For a period of 90 days after the date hereof, we will not, without the prior written consent of the Initial Purchasers, issue, offer, sell or contract to sell, or announce the offering of, any non-Won denominated debt securities issued or guaranteed by us. We will not at any time offer, sell, contract to sell, pledge or otherwise dispose of, directly or indirectly, any securities under circumstances where such offer, sale, pledge, contract or disposition would cause the exemption afforded by Section 4(2) of the Securities Act or the safe harbor of Regulation S to cease to be applicable to the offer and sale of the Notes.

Short Positions

In connection with the offering, the Initial Purchasers may purchase and sell the Notes in the open market. These transactions may include short sales and purchases on the open market to cover positions created by short sales. Short sales involve the sale by the Initial Purchasers of a greater principal amount of Notes than they are required to purchase in the offering. The Initial Purchasers must close out any short position by purchasing Notes in the open market. A short position is more likely to be created if the Initial Purchasers are concerned that there may be downward pressure on the price of the Notes in the open market after pricing that could adversely affect investors who purchase Notes in the offering.

Similar to other purchase transactions, the Initial Purchasers' purchases to cover the syndicate short sales may have the effect of raising or maintaining the market price of the Notes or preventing or retarding a decline in the market price of the Notes. As a result, the price of the Notes may be higher than the price that might otherwise exist in the open market.

None of us and the Initial Purchasers makes any representation or prediction as to the direction or magnitude of any effect that the transactions described above may have on the price of the Notes. In addition, none of us and the Initial Purchasers makes any representation that the Initial Purchasers will engage in these transactions or that these transactions, once commenced, will not be discontinued without notice.

Selling Restrictions

General

No action has been or will be taken in any jurisdiction that would permit a public offering of the Notes, or the possession, circulation or distribution of this offering circular or any amendment or supplement to this offering circular, in any country or jurisdiction where action for any such purposes is required. Accordingly, the Notes may not be offered or sold, directly or indirectly, and neither this offering circular nor any other offering material or advertisements in connection with the Notes may be distributed or published, in or from any country or jurisdiction except under circumstances that will result in compliance with applicable laws and regulations.

United States

The Notes have not been and will not be registered under the Securities Act and, subject to certain exceptions, may not be offered or sold within the United States.

The Notes are being offered and sold outside of the United States in reliance on Regulation S. The Purchase Agreement provides that the Initial Purchasers may directly or through their respective U.S. broker-dealer affiliates arrange for the offer and resale of the Notes within the United States only to qualified institutional buyers in reliance on Rule 144A.

In addition, until 40 days after the commencement of the offering of the Notes, an offer or sale of Notes within the United States by any dealer (whether or not participating in the offering) may violate the registration requirements of the Securities Act if such offer or sale is made otherwise than in accordance with Rule 144A.

European Economic Area

In relation to each Member State of the European Economic Area, each of the Initial Purchasers has represented and agreed that it has not made and will not make an offer of Notes which are the subject of the offering contemplated by this offering circular to the public in that Member State other than:

(a) to any legal entity which is a qualified investor as defined in the Prospectus Regulation;

(b) to fewer than 150 natural or legal persons (other than qualified investors as defined in the Prospectus Regulation), subject to obtaining the prior consent of the relevant Initial Purchaser or Initial Purchasers nominated by us for any such offer; or

(c) in any other circumstances falling within Article 1(4) of the Prospectus Regulation;

provided that no such offer of Notes shall require us or any Initial Purchaser to publish a prospectus pursuant to Article 3 of the Prospectus Regulation or supplement a prospectus pursuant to Article 23 of the Prospectus Regulation.

For the purposes of this provision, the expression an "offer of Notes to the public" in relation to any Notes in any Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the Notes to be offered so as to enable an investor to decide to purchase or subscribe for the Notes and the expression "Prospectus Regulation" means Regulation (EU) 2017/1129, as amended.

The European Economic Area selling restriction described above is in addition to any other applicable selling restriction set out below.

United Kingdom

Each of the Initial Purchasers has severally represented and agreed that:

(a) it has only communicated or caused to be communicated and will only communicate or cause to be communicated an invitation or inducement to engage in investment activity (within the meaning of Section 21 of the Financial Services and Markets Act of 2000 (the "FSMA")) received by it in connection with the issue or sale of the Notes in circumstances in which Section 21(1) of the FSMA does not apply to us; and

(b) it has complied and will comply with all applicable provisions of the FSMA with respect to anything done by it in relation to the Notes in, from or otherwise involving the United Kingdom.

Korea

Each Initial Purchaser has represented and agreed that the Notes have not been and will not be offered, delivered or sold directly or indirectly in Korea or to any resident of Korea or to others for re-offering or resale directly or indirectly in Korea or to any resident of Korea (as defined in the Foreign Exchange Transactions Act of Korea and the regulations thereunder) except as otherwise permitted under applicable Korean laws and regulations.

In addition, each Initial Purchaser has confirmed that during the first year after the issuance of the Notes, the Notes may not be transferred to any resident of Korea other than a "qualified institutional buyer" (a "Korean QIB", as defined in the Regulation on Securities Issuance, Public Disclosure, Etc. of Korea) who is registered with the Korea Financial Investment Association for Korean QIB bond trading. Furthermore, the Notes acquired by all Korean QIBs at the time of issuance must be no more than 20% of the aggregate principal amount of the Notes.

Each Initial Purchaser has undertaken to use commercially reasonable best measures as an Initial Purchaser in the ordinary course of its business so that any securities dealer to which it sells the Notes confirms that it is purchasing such Notes as principal and agrees with such Initial Purchaser that it will comply with the restrictions described above.

Japan

The Notes have not been and will not be registered under the Financial Instruments and Exchange Act of Japan (Act No. 25 of 1948, as amended, the "Financial Instruments and Exchange Act"). Accordingly, each Initial Purchaser has represented and agreed that it has not, directly or indirectly, offered or sold and will not, directly or indirectly, offer or sell any Notes in Japan or to, or for the benefit of, any resident of Japan (which term as used herein means any person resident in Japan, including any corporation or other entity organized under the laws of Japan) or to others for re-offering or re-sale, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the Financial Instruments and Exchange Act and other relevant laws and regulations of Japan.

Hong Kong

Each Initial Purchaser has represented and agreed that:

(a) it has not offered or sold, and will not offer or sell, in Hong Kong, by means of any document, any Notes other than (i) to "professional investors" as defined in the Securities and Futures Ordinance (Cap. 571) of Hong Kong (the "SFO"), and any rules made under the SFO, or (ii) in other circumstances which do not result in the document being a "prospectus" as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32) of Hong Kong (the "C(WUMP)O") or which do not constitute an offer to the public within the meaning of the C(WUMP)O; and

(b) it has not issued, or had in its possession for the purposes of issue, and will not issue or have in its possession for the purposes of issue, whether in Hong Kong or elsewhere, any advertisement, invitation or document relating to the Notes which is directed at, or the contents of which are likely to be accessed or read by, the public of Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to Notes which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" as defined in the SFO and any rules made under the SFO.

Singapore

Each Initial Purchaser has acknowledged that this offering circular has not been and will not be registered as a prospectus with the Monetary Authority of Singapore under the Securities and Futures Act 2001 of Singapore (the "SFA"). Each Initial Purchaser represents, warrants and agrees that it has not offered or sold any Notes or caused the Notes to be made the subject of an invitation for subscription or purchase, and will not offer or sell any Notes or cause the Notes to be made the subject of an invitation for subscription or purchase, and has not circulated or distributed, nor will it circulate or distribute, this offering circular and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the Notes, whether directly or indirectly, to any person in Singapore other than (i) to an institutional investor under Section 274 of the SFA, (ii) to a relevant person pursuant to Section 275(1) of the SFA, or any person pursuant to Section 275(1A) of the SFA, and in accordance with the conditions specified in Section 275 of the SFA and (where applicable) Regulation 3 of the Securities and Futures (Classes of Investors) Regulations 2018 of Singapore, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the Notes are subscribed or purchased under Section 275 of the SFA by a relevant person which is:

(a) a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or

(b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary of the trust is an individual who is an accredited investor,

securities or securities-based derivatives contracts (each term as defined in the SFA) of that corporation or the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the Notes pursuant to an offer made under Section 275 of the SFA except:

(1) to an institutional investor or to a relevant person defined in Section 275(2) of the SFA or to any person arising from an offer referred to in Section 275(1A) or Section 276(4)(c)(ii) of the SFA;

(2) where no consideration is or will be given for the transfer;

(3) where the transfer is by operation of law;

(4) as specified in Section 276(7) of the SFA; or

(5) as specified in Regulation 37A of the Securities and Futures (Offers of Investments) (Securities and Securities-based Derivatives Contracts) Regulations 2018 of Singapore.

Republic of Italy

The offering of the Notes has not been registered with the *Commissione Nazionale per le Società e la Borsa* ("CONSOB") pursuant to Italian securities legislation and, accordingly, no Notes may be offered, sold or delivered, nor may copies of this offering circular or of any other document relating to any Notes be distributed in Italy, except, in accordance with any Italian securities, tax and other applicable laws and regulations.

Each Initial Purchaser has represented and agreed that it has not offered, sold or delivered, and will not offer, sell or deliver any Notes or distribute any copy of this offering circular or any other document relating to the Notes in Italy except:

(a) to qualified investors (*investitori qualificati*), as defined pursuant to Article 100 of Legislative Decree no. 58 of 24 February 1998 (the "Financial Services Act") and Article 34-ter, paragraph 1, letter (b) of CONSOB regulation No. 11971 of 14 May 1999 (the "Issuers Regulation"), all as amended from time to time; or

(b) in other circumstances which are exempted from the rules on public offerings pursuant to Article 100 of the Financial Services Act and Issuers Regulation.

In any event, any offer, sale or delivery of the Notes or distribution of copies of this offering circular or any other document relating to the Notes in Italy under paragraphs (a) or (b) above must be:

(i) made by an investment firm, bank or financial intermediary permitted to conduct such activities in Italy in accordance with the Financial Services Act, Legislative Decree No. 385 of 1 September 1993 (the "Banking Act") and CONSOB Regulation No. 20307 of 15 February 2018, all as amended from time to time;

(ii) in compliance with Article 129 of the Banking Act, as amended from time to time, and the implementing guidelines of the Bank of Italy, as amended from time to time; and

(iii) in compliance with any other applicable laws and regulations, including any limitation or requirement which may be imposed from time to time by CONSOB or the Bank of Italy or other competent authority.

Switzerland

This Offering Circular is not intended to constitute an offer or solicitation to purchase or invest in the Notes described herein. The Notes may not be publicly offered, sold or advertised, directly or indirectly, in, into or from Switzerland and will not be listed on the SIX Swiss Exchange or on any other exchange or regulated trading facility in Switzerland. Neither this Offering Circular nor any other offering or marketing material relating to the Notes constitutes a prospectus as such term is understood pursuant to article 652a or article 1156 of the Swiss Code of Obligations or a listing prospectus within the meaning of the listing rules of the SIX Swiss Exchange or any other regulated trading facility in Switzerland or a simplified prospectus or a prospectus as such term is defined in the Swiss Collective Investment Scheme Act, and neither this Offering Circular nor any other offering or marketing material relating to the Notes may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this Offering Circular nor any other offering or marketing material relating to the offering, nor the Issuer nor the Notes have been or will be filed with or approved by any Swiss regulatory authority. The Notes are not subject to the supervision by any Swiss regulatory authority, e.g., the Swiss Financial Markets Supervisory Authority ("FINMA"), and investors in the Notes will not benefit from protection or supervision by such authority.

Other Relationships

Some of the Initial Purchasers and their affiliates have engaged in, and may in the future engage in, investment banking and other commercial dealings in the ordinary course of business with us or our affiliates. They have received, or may in the future receive, customary fees and commissions for these transactions.

The Initial Purchasers or certain of their affiliates may purchase Notes and be allocated Notes for asset management and/or proprietary purposes but not with a view to distribution. The Initial Purchasers or their respective affiliates may purchase Notes for its or their own account and enter into transactions, including credit derivatives, such as asset swaps, repackaging and credit default swaps relating to Notes and/or our other securities at the same time as the offer and sale of Notes or in secondary market transactions. Such transactions would be carried out as bilateral trades with selected counterparties and separately from any existing sale or resale of Notes to which this offering circular relates (notwithstanding that such selected counterparties may also be purchasers of Notes). We have been advised by the Initial Purchasers that they may offer and sell Notes to or through any of their respective affiliates and any such affiliate may offer and sell Notes purchased by it to or through any Initial Purchaser.

In addition, in the ordinary course of their business activities, the Initial Purchasers and their affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers. Such investments and securities activities may involve securities and/or instruments of ours and our affiliates. Certain of the Initial Purchasers or their affiliates that have a lending relationship with us routinely hedge their credit exposure to us consistent with their customary risk management policies. Typically, such Initial Purchasers and their affiliates would hedge such exposure by entering into transactions which consist of either the purchase of credit default swaps or the creation of short positions in our securities, including potentially the Notes. Any such short positions could adversely affect future trading prices of the Notes. The Initial Purchasers and their affiliates may also make investment recommendations and/or publish or express independent research views in respect of such securities or financial instruments and may hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

TRANSFER RESTRICTIONS

Because of the following restrictions, investors are advised to consult legal counsel prior to making any offer, resale, pledge or other transfer of the Notes offered pursuant to this offering circular.

Korea

Each purchaser of the Notes, by accepting delivery of this offering circular, will be deemed to have acknowledged, represented and agreed as follows:

THE NOTES HAVE NOT BEEN AND WILL NOT BE REGISTERED UNDER THE FINANCIAL INVESTMENT SERVICES AND CAPITAL MARKETS ACT OF KOREA. ACCORDINGLY, THE NOTES MAY NOT BE OFFERED, SOLD OR DELIVERED, DIRECTLY OR INDIRECTLY, IN KOREA OR TO, OR FOR THE ACCOUNT OR BENEFIT OF, ANY RESIDENT OF KOREA (AS SUCH TERM IS DEFINED UNDER THE FOREIGN EXCHANGE TRANSACTIONS ACT OF KOREA AND ITS ENFORCEMENT DECREE) OR TO OTHERS FOR RE-OFFERING OR RESALE, DIRECTLY OR INDIRECTLY, IN KOREA OR TO, OR FOR THE ACCOUNT OR BENEFIT OF, ANY RESIDENT OF KOREA EXCEPT AS OTHERWISE PERMITTED UNDER APPLICABLE KOREAN LAWS AND REGULATIONS.

IN ADDITION, DURING THE FIRST YEAR AFTER THE ISSUANCE OF THE NOTES, THE NOTES MAY NOT BE TRANSFERRED TO ANY RESIDENT OF KOREA OTHER THAN A "QUALIFIED INSTITUTIONAL BUYER" (A "KOREAN QIB", AS DEFINED IN THE REGULATION ON SECURITIES ISSUANCE, PUBLIC DISCLOSURE, ETC. OF KOREA) WHO IS REGISTERED WITH THE KOREA FINANCIAL INVESTMENT ASSOCIATION AS A KOREAN QIB, PROVIDED THAT THE AMOUNT OF THE NOTES ACQUIRED BY SUCH KOREAN QIBS IN THE PRIMARY MARKET IS LIMITED TO NO MORE THAN 20 PERCENT OF THE AGGREGATE ISSUE AMOUNT OF THE NOTES.

United States

The Notes have not been and will not be registered under the Securities Act or the securities laws of any state of the United States or the securities laws of any other jurisdiction. The Notes may not be offered or sold within the United States, except in reliance on Rule 144A to QIBs. The Notes may also be offered and sold in offshore transactions in reliance on Regulation S.

Each purchaser of the Notes hereunder will be deemed to have represented and agreed as follows (terms used in this paragraph that are defined in Rule 144A or in Regulations S under the Securities Act are used in this offering circular as defined in the Securities Act):

1. it is purchasing the Notes for its own account or an account with respect to which it exercises sole investment discretion, and it and any such account (i) is a QIB, and is aware that the sale to it is being made in reliance on Rule 144A or (ii) is purchasing the Notes in an offshore transaction pursuant to Regulation S;

2. it acknowledges that the Notes have not been and will not be registered under the Securities Act or with any securities regulatory authority of any jurisdiction and may not be offered or sold within the United States except as set forth below;

3. it understands and agrees that if in the future it decides to sell, pledge or otherwise transfer any Notes or any beneficial interest in any Notes, such Notes may be offered, resold, pledged or transferred only (A)(i) to us, (ii) to a person whom the seller reasonably believes is a QIB in a transaction meeting the requirements of Rule 144A, (iii) in an offshore transaction meeting the requirements of Rule 903 or 904 of Regulation S under the Securities Act, (iv) pursuant to an exemption from registration under the Securities Act provided by Rule 144 under the

Securities Act (if available) or (v) pursuant to another exemption from the Securities Act, provided that, as a condition to the registration of the transfer thereof, the Registrar or we may require the delivery of any documents, including an opinion of counsel that it, in its sole discretion, may deem necessary or appropriate to evidence compliance with such exemption, or (B) pursuant to an effective registration statement under the Securities Act, and, in each of such cases in accordance with any applicable securities laws of any state of the United States;

4. it agrees to, and each subsequent holder is required to, notify any purchaser of the Notes from it of the resale restrictions referred to in clause (3)(A) above, if then applicable;

5. it understands and agrees that Notes initially offered in the United States to QIBs will be represented by global notes (the "Rule 144A Global Notes") and that Notes initially offered outside the United States in reliance on Regulation S will be represented by other Regulation S Global Notes" and, together with the Rule 144A Global Notes, the "Global Notes");

6. it understands that the Rule 144A Global Notes will, until the expiration of the applicable holding period with respect to the Notes set forth in Rule 144 of the Securities Act, unless otherwise agreed by us, bear a legend substantially to the following effect:

   "THIS SECURITY HAS NOT BEEN REGISTERED UNDER THE U.S. SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"). THE HOLDER HEREOF, BY PURCHASING THIS SECURITY, AGREES FOR THE BENEFIT OF LG CHEM, LTD. (THE "COMPANY") THAT THIS SECURITY MAY BE OFFERED, RESOLD, PLEDGED OR OTHERWISE TRANSFERRED ONLY (A)(i) TO THE COMPANY, (ii) TO A PERSON WHOM THE SELLER REASONABLY BELIEVES IS A QUALIFIED INSTITUTIONAL BUYER, AS DEFINED IN RULE 144A UNDER THE SECURITIES ACT, IN A TRANSACTION MEETING THE REQUIREMENTS OF RULE 144A UNDER THE SECURITIES ACT, (iii) IN AN OFFSHORE TRANSACTION MEETING THE REQUIREMENTS OF RULE 903 OR 904 OF REGULATION S UNDER THE SECURITIES ACT, (iv) PURSUANT TO AN EXEMPTION FROM REGISTRATION UNDER THE SECURITIES ACT PROVIDED BY RULE 144 UNDER THE SECURITIES ACT (IF AVAILABLE) OR (v) PURSUANT TO ANOTHER EXEMPTION FROM THE SECURITIES ACT, PROVIDED THAT, AS A CONDITION TO THE REGISTRATION OF THE TRANSFER THEREOF, THE COMPANY OR THE FISCAL AGENT MAY REQUIRE THE DELIVERY OF ANY DOCUMENTS, INCLUDING AN OPINION OF COUNSEL THAT IT, IN ITS SOLE DISCRETION, MAY DEEM NECESSARY OR APPROPRIATE TO EVIDENCE COMPLIANCE WITH SUCH EXEMPTION, OR (B) PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT, AND, IN EACH OF SUCH CASES IN ACCORDANCE WITH ANY APPLICABLE SECURITIES LAWS OF ANY STATE OF THE UNITED STATES. THE HOLDER WILL, AND EACH SUBSEQUENT HOLDER IS REQUIRED TO, NOTIFY ANY SUBSEQUENT PURCHASER OF THE SECURITY FROM IT OF THE RESALE RESTRICTIONS REFERRED TO IN (A) ABOVE."

7. it understands that, unless otherwise agreed by us, the Regulation S Global Notes will bear a legend substantially to the following effect:

   "THIS SECURITY (OR ITS PREDECESSOR) WAS ORIGINALLY ISSUED IN A TRANSACTION EXEMPT FROM REGISTRATION UNDER THE U.S. SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), AND MAY NOT BE TRANSFERRED IN THE UNITED STATES EXCEPT PURSUANT TO AN AVAILABLE EXEMPTION FROM THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT AND ALL APPLICABLE STATE SECURITIES LAWS. TERMS USED ABOVE HAVE THE MEANINGS GIVEN TO THEM IN REGULATION S UNDER THE SECURITIES ACT."

8. it acknowledges that prior to any proposed transfer of any Notes in certificated form or of beneficial interests in the Global Notes (other than pursuant to an effective registration statement), the holder of the Notes or the holder of beneficial interests in the Global Notes, as the case may be, may be required to provide certificates and other documentation relating to the manner of such transfer and submit such certifications and other documentation as provided in the Notes and the applicable Agency Agreement; and

9. it acknowledges that we, the Initial Purchasers, the Fiscal Agent and others will rely upon the truth and accuracy of the foregoing acknowledgments, representations and agreements and agrees that if any of such acknowledgments, representations or warranties deemed to have been made by virtue of its purchase of the Notes is no longer accurate, it shall promptly notify us; and if it is acquiring any Notes as a fiduciary or agent for one or more accounts, it represents that it has sole investment discretion with respect to each such account and that it has full power to make the foregoing acknowledgments, representations and agreement on behalf of each such account.

Each purchaser and subsequent transferee acknowledges and agrees that they will be deemed by such purchase or holding of the Notes (or any beneficial interest therein) that either (i) no portion of the assets used by such purchaser or transferee to acquire or hold the Notes or any beneficial interest therein constitutes assets of any employee benefit plan subject to Title I of the United States Employee Retirement Income Security Act of 1974, as amended ("ERISA"), plan, individual retirement account or other arrangement subject to Section 4975 of the United States Internal Revenue Code of 1986, as amended (the "Code") or provisions under any other federal, state, local, non-U.S. or other laws or regulations that are similar to such provisions of ERISA or the Code (collectively, "Similar Laws") or any entity whose underlying assets are considered to include "plan assets" of any such employee benefit plan, plan, account or arrangement or (ii) the purchase and holding of the Notes or any beneficial interest therein by such purchaser or transferee will not constitute a non-exempt prohibited transaction under Section 406 of ERISA or Section 4975 of the Code or a similar violation of any applicable Similar Laws.

Singapore

This offering circular has not been and will not be registered as a prospectus with the Monetary Authority of Singapore under the Securities and Futures Act 2001 of Singapore (the "SFA"). Accordingly, this offering circular and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the Notes may not be circulated or distributed, nor may the Notes be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to any person in Singapore other than (i) to an institutional investor under Section 274 of the SFA; (ii) to a relevant person pursuant to Section 275(1) of the SFA, or any person pursuant to Section 275(1A) of the SFA, and in accordance with the conditions specified in Section 275 of the SFA and (where applicable) Regulation 3 of the Securities and Futures (Classes of Investors) Regulations 2018 of Singapore; or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the Notes are initially subscribed or purchased by (i) an institutional investor under Section 274 of the SFA, or (ii) a relevant person pursuant to Section 275(1) of the SFA, or any person pursuant to Section 275(1A) of the SFA, and in accordance with the conditions specified in Section 275 of the SFA and (where applicable) Regulation 3 of the Securities and Futures (Classes of Investors) Regulations 2018 of Singapore, the Notes may only be sold or transferred: (a) at any time, to an institutional investor under Section 274 of the SFA; (b) at any time, to a relevant person defined in Section 275(2) of the SFA or to any person pursuant to an offer referred to in Section 275(1A) of the SFA; or (c) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the Notes are subscribed or purchased under Section 275 of the SFA by a relevant person which is:

1. a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or

2. a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary of the trust is an individual who is an accredited investor,

securities or securities-based derivatives contracts (each term as defined in the SFA) of that corporation or the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the Notes pursuant to an offer made under Section 275 of the SFA except:

1. to an institutional investor or to a relevant person defined in Section 275(2) of the SFA or to any person arising from an offer referred to in Section 275(1A) or Section 276(4)(c)(ii) of the SFA;

2. where no consideration is or will be given for the transfer;

3. where the transfer is by operation of law;

4. as specified in Section 276(7) of the SFA; or

5. as specified in Regulation 37A of the Securities and Futures (Offers of Investments) (Securities and Securities-based Derivatives Contracts) Regulations 2018 of Singapore.

LEGAL MATTERS

Certain legal matters relating to the Offering will be passed upon for us by Cleary Gottlieb Steen & Hamilton LLP, our special U.S. counsel, and for the Initial Purchasers by Linklaters LLP, their special U.S. counsel. Certain legal matters relating to the Offering will be passed upon for us by Lee & Ko, our Korean counsel. Cleary Gottlieb Steen & Hamilton LLP and Linklaters LLP may rely as to all matters of Korean law on the opinion of Lee & Ko. Lee & Ko may rely as to all matters of New York law on the opinion of Cleary Gottlieb Steen & Hamilton LLP.

INDEPENDENT ACCOUNTANTS

Our annual consolidated financial statements as of and for the years ended December 31, 2021 and 2020 included in this offering circular have been audited by Samil PricewaterhouseCoopers, independent accountants, as stated in their report (which contains emphasis of matter paragraphs that describe (i) uncertainty relating to the impact of the COVID-19 pandemic and (ii) our settlement with SK on, Co., Ltd.) appearing herein. Our annual consolidated financial statements as of and for the years ended December 31, 2020 and 2019 included in this offering circular have been audited by Samil PricewaterhouseCoopers, independent accountants, as stated in their report (which contains an emphasis of matter paragraph that describes uncertainty relating to the impact of the COVID-19 pandemic) appearing herein.

With respect to our unaudited consolidated interim financial statements as at March 31, 2022 and for the three-month periods ended March 31, 2022 and 2021 included in this offering circular, Samil PricewaterhouseCoopers reported that they have applied limited procedures in accordance with professional standards for a review of such information. In addition, their separate report dated May 16, 2022 (which contains an emphasis of matter paragraph that describes uncertainty relating to the impact of the COVID-19 pandemic) appearing herein states that they did not audit and they do not express an opinion on such interim financial information. Accordingly, the degree of reliance on their report on such information should be restricted in light of the limited nature of the review procedures applied.

AVAILABLE INFORMATION

To permit compliance with Rule 144A under the Securities Act in connection with sales of the Notes, we will be required to furnish, upon request of a holder of Notes, to such holder of Notes and any prospective investor designated by such holder of Notes, the information required to be delivered under Rule 144A(d)(4) under the Securities Act unless at the time of the request we are a reporting company under Section 13 or Section 15(d) of the Exchange Act, or included in the list of foreign private issuers that claim exemption from the registration requirements of Section 12(g) of the Exchange Act (and therefore are required to publish on our website, in English, certain information pursuant to Rule 12g3-2(b) under the Exchange Act). Any such request should be directed to LG CHEM, LTD., Attention: Finance Team (telephone: +82-2-3773-6247, fax: +82-2-3773-7813).

You should rely only upon the information provided in this offering circular. We have not authorized anyone to provide you with different information. You should not assume that the information in this offering circular is accurate as of any date other than the date of this offering circular.

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Report on Review of Interim Financial Statements

(English Translation of a Report Originally Issued in Korean)

To the Shareholders and Board of Directors of
LG Chem, Ltd.

Reviewed Financial Statements

We have reviewed the accompanying consolidated interim financial statements of LG Chem, Ltd. and its subsidiaries (collectively referred to as the “Group”). These financial statements consist of the consolidated interim statement of financial position of the Group as at March 31, 2022, and the related consolidated interim statements of profit or loss, comprehensive income, changes in equity and cash flows for the three-month periods ended March 31, 2022 and 2021, and notes to the consolidated interim financial statements, including a summary of significant accounting policies.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated interim financial statements in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (Korean IFRS) 1034 *Interim Financial Reporting*, and for such internal control as management determines is necessary to enable the preparation of consolidated interim financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to issue a report on these consolidated interim financial statements based on our review.

We conducted our review in accordance with quarterly or semi-annual review standards established by the Securities and Futures Commission of the Republic of Korea. A review of interim financial information consists of making inquiries, primarily of persons responsible for financial and accounting matters, and applying analytical and other review procedures. A review is substantially less in scope than an audit conducted in accordance with Korean Standards on Auditing and consequently does not enable us to obtain assurance that we would become aware of all significant matters that might be identified in an audit. Accordingly, we do not express an audit opinion.

Conclusion

Based on our review, nothing has come to our attention that causes us to believe the accompanying consolidated interim financial statements are not presented fairly, in all material respects, in accordance with Korean IFRS 1034 *Interim Financial Reporting*.

Emphasis of Matter

Without modifying our conclusion, we draw attention to Note 4 to the consolidated interim financial statements. Note 4 to the interim consolidated financial statements describes uncertainty relating to the impact of Coronavirus disease 2019 (COVID-19) on the Group's productivity and ability to satisfy customer's orders.

Other Matters

We have audited the consolidated statement of financial position of the Group as at December 31, 2021, and the related consolidated statements of profit or loss, comprehensive income, changes in equity and cash flows for the year then ended, in accordance with Korean Standards on Auditing. We expressed an unqualified opinion on those financial statements, not presented herein, in our audit report dated March 8, 2022. The consolidated statement of financial position as at December 31, 2021, presented herein for comparative purposes, is consistent, in all material respects, with the above audited statement of financial position as at December 31, 2021.

Review standards and their application in practice vary among countries. The procedures and practices used in the Republic of Korea to review such financial statements may differ from those generally accepted and applied in other countries.

/s/ Samil PricewaterhouseCoopers

May 16, 2022
Seoul, Korea

This report is effective as of May 16, 2022, the review report date. Certain subsequent events or circumstances, which may occur between the review report date and the time of reading this report, could have a material impact on the accompanying consolidated interim financial statements and notes thereto. Accordingly, the readers of the review report should understand that there is a possibility that the above review report may have to be revised to reflect the impact of such subsequent events or circumstances, if any.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Financial Position
March 31, 2022 and 2021

(in millions of Korean won)	Notes	March 31, 2022 (Unaudited)	December 31, 2021
Assets			
Current assets			
Cash and cash equivalents	3,5,6	9,052,010	3,760,834
Trade receivables	3,5,7,31	7,018,529	6,386,979
Other receivables	3,5,7,31	6,313,252	1,048,549
Other current financial assets	3,5,8	68,015	23,289
Prepaid income taxes		166,280	156,299
Other current assets	13	829,323	749,032
Inventories	9	9,311,896	8,283,474
Assets held for sale	34	5,367	5,364
Total current assets		32,764,672	20,413,820
Non-current assets			
Trade receivables	3,5,7	75,103	67,055
Other receivables	3,5,7	597,834	713,166
Other non-current financial assets	3,5,8	592,634	506,022
Investments in associates and joint ventures	1,10,33	530,920	535,310
Deferred tax assets	28	1,988,794	1,905,149
Property, plant and equipment	11	25,232,426	24,378,259
Intangible assets	12	2,491,565	2,444,303
Investment properties	36	56,511	56,297
Other non-current assets	13	86,996	115,921
Total non-current assets		31,652,783	30,721,482
Total assets		64,417,455	51,135,302
Liabilities			
Current liabilities			
Trade payables	3,5,31	4,690,565	3,742,132
Other payables	3,5,31	3,203,031	3,991,784
Borrowings	3,5,14	4,370,159	3,477,080
Provisions	15	1,430,404	1,572,755
Income tax payables	28	1,328,051	957,676
Other current liabilities	3,5,17	1,943,638	1,320,669
Total current liabilities		16,965,848	15,062,096
Non-current liabilities			
Other payables	3,5	16,103	15,623
Borrowings	3,5,14	10,323,993	11,288,654
Other non-current financial liabilities	3,5,8	-	126
Provisions	15	559,226	636,953
Net defined benefit liabilities	13,16	39,883	18,122
Deferred tax liabilities	28	846,190	713,862
Other non-current liabilities	17	175,112	189,878
Total non-current liabilities		11,960,507	12,863,218
Total liabilities		28,926,355	27,925,314

The above consolidated statements of financial position should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Financial Position
March 31, 2022 and 2021

(in millions of Korean won)	Notes	March 31, 2022 (Unaudited)	December 31, 2021
Equity			
Share capital	1,19	391,406	391,406
Capital surplus		11,407,631	2,696,385
Other components of equity	21	(37,310)	(37,310)
Accumulated other comprehensive income		717,954	551,354
Retained earnings	20	17,842,157	18,091,949
Equity attributable to owners of the Parent Company		30,321,838	21,693,784
Non-controlling interest		5,169,262	1,516,204
Total equity		35,491,100	23,209,988
Total liabilities and equity		₩ 64,417,455	₩ 51,135,302

The above consolidated statements of financial position should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Profit or Loss
Three-Month Periods Ended March 31, 2022 and 2021

(in millions of Korean won, except per share amounts)	Notes	Period Ended March 31	
		2022 (Unaudited)	2021 (Unaudited)
Revenue	31, 33, 35	11,608,071	9,644,693
Cost of sales	23, 31	(9,110,372)	(7,186,507)
Gross profit		2,497,699	2,458,186
Selling and administrative expenses	22, 23, 31	(1,473,439)	(1,048,702)
Operating profit	33	1,024,260	1,409,484
Finance income	5, 25	196,258	158,456
Finance costs	5, 25	(238,905)	(195,082)
Share of net profit of associates and joint ventures accounted for using the equity method	10	(7,228)	1,934
Other non-operating income	5, 26	286,845	315,869
Other non-operating expenses	5, 27	(237,668)	(262,689)
Profit before income tax	32	1,023,562	1,427,972
Income tax expense	28	(253,652)	(384,034)
Profit from continuing operations		769,910	1,043,938
Profit (loss) from discontinued operations	34	(688)	327,034
Profit for the period		769,222	1,370,972
Profit is attributable to:			
Owners of the Parent Company			
Profit from continuing operations		688,866	979,668
Profit (loss) from discontinued operations		(688)	327,034
		688,178	1,306,702
Non-controlling interests			
Profit from continuing operations		81,044	64,270
		81,044	64,270
Earnings per share for profit attributable to the owners of the Parent Company *(in won)*	29		
Basic and diluted earnings per ordinary share		8,832	16,776
Basic and diluted earnings per preferred share		8,845	16,788
Earnings per share for profit from continuing operations attributable to the owners of the Parent Company *(in won)*	29		
Basic and diluted earnings per ordinary share		8,841	12,577
Basic and diluted earnings per preferred share		8,853	12,589

The above consolidated interim statements of profit or loss should be read in conjunction with the accompanying notes

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Comprehensive Income
Three-Month Periods Ended March 31, 2022 and 2021

(in millions of Korean won)	Notes	Period Ended March 31	
		2022 (Unaudited)	2021 (Unaudited)
Profit for the period		769,222	1,370,972
Other comprehensive income			
Items that will not be reclassified to profit or loss			
Remeasurements of net defined benefit liabilities	16	(2,867)	9,801
Gain (loss) on valuation of financial assets at fair value through other comprehensive income		(312)	2,297
Shares of remeasurements of net defined benefit liabilities of associates		-	(234)
Income tax relating to these items		763	(3,332)
Items that may be subsequently reclassified to profit or loss			
Exchange differences on translation of foreign operations		181,551	181,011
Cash flow hedge		59,071	(4,257)
Shares of other comprehensive income of associates and joint ventures		8,145	3,574
Income tax relating to these items		(40,896)	18,130
Other comprehensive income for the period, net of tax		205,455	206,990
Total comprehensive income for the period		974,677	1,577,962
Total comprehensive income for the period is attributable to:			
Owners of the Parent Company		852,729	1,492,596
Non-controlling interest		121,948	85,366

The above consolidated interim statements of comprehensive income should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Changes in Equity
Three-Month Periods Ended March 31, 2022 and 2021

(in millions of Korean won)

	Notes	Attributable to owners of the Parent Company						Non-controlling interests	Total equity
		Share capital	Capital surplus	Other components of Equity	Accumulated other comprehensive income (loss)	Retained earnings	Total		
Balance at January 1, 2021		391,406	2,692,485	(54,998)	(165,076)	15,175,304	18,039,121	751,319	18,790,440
Comprehensive income									
Profit for the year		-	-	-	-	1,306,702	1,306,702	64,270	1,370,972
Remeasurements of net defined benefit liabilities	16	-	--	--	-	7,101	7,101	-	7,101
Exchange differences on translation of foreign operations		-	-	-	176,875	-	176,875	21,096	197,971
Gain on valuation of financial assets at fair value through other comprehensive income		-	-	-	1,665	-	1,665	-	1,665
Cash flow hedge		-	-	-	(3,087)	-	(3,087)	-	(3,087)
Others					3,574	(234)	3,340	-	3,340
Total comprehensive income for the period		-	-	-	179,027	1,313,569	1,492,596	85,366	1,577,962
Transactions with owners:									
Disposal of treasury shares		-	28,344	14,302	-	-	42,646	-	42,646
Dividends	30	-	-	-	-	(778,383)	(778,383)	(91,334)	(869,717)
Increase in paid-in capital of a subsidiary		-	-	-	-	-	-	110,339	110,339
Others		-	-	-	-	(2,006)	(2,006)	(1,588)	(3,594)
Total transactions with owners		-	28,344	14,302	-	(780,389)	(737,743)	17,417	(720,326)
Balance at March 31, 2021 (Unaudited)		391,406	2,720,829	(40,696)	13,951	15,708,484	18,793,974	854,102	19,648,076
Balance at January 1, 2022		391,406	2,696,385	(37,310)	551,354	18,091,949	21,693,784	1,516,204	23,209,988
Comprehensive income									
Profit for the year		-	-	-	-	688,178	688,178	81,044	769,222
Remeasurements of net defined benefit liabilities	16	-	-	-	-	(2,049)	(2,049)	(40)	(2,089)
Exchange differences on translation of foreign operations		-	-	-	111,724	-	111,724	29,330	141,054
Gain on valuation of financial assets at fair value through other comprehensive income		-	-	-	(686)	-	(686)	358	(328)
Cash flow hedge		-	-	-	48,317	-	48,317	10,356	58,673
Others		-	-	-	7,245	-	7,245	900	8,145
Total comprehensive income for the period		-	-	-	166,600	686,129	852,729	121,948	974,677
Transactions with owners:									
Dividends	30	-	-	-	-	(935,275)	(935,275)	-	(935,275)
Changes in ownership percentage of subsidiaries		-	8,711,246	-	-	-	8,711,246	3,297,211	12,008,457
Increase in paid-in capital of a subsidiary		-	-	-	-	-	-	234,037	234,037
Others		-	-	-	-	(646)	(646)	(138)	(784)
Total transactions with owners		-	8,711,246	-	-	(935,921)	7,775,325	3,531,110	11,306,435
Balance at March 31, 2022 (Unaudited)		391,406	11,407,631	(37,310)	717,954	17,842,157	30,321,838	5,169,262	35,491,100

The above consolidated interim statements of changes in equity should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Cash Flows
Three-Month Periods Ended March 31, 2022 and 2021

(in millions of Korean won)	Notes	Period Ended March 31	
		2022 (Unaudited)	2021 (Unaudited)
Cash flows from operating activities			
Cash generated from operations	32	665,327	1,313,259
Interest received		20,678	8,773
Interest paid		(61,065)	(39,807)
Dividends received		5,000	-
Income taxes paid		(473,804)	(216,021)
Net cash inflow from operating activities		156,136	1,066,204
Cash flows from investing activities			
Decrease in other receivables		18,651	412,255
Decrease in other non-current receivables		7,704	29,334
Proceeds from disposal of financial instruments		-	987
Proceeds from disposal of property, plant and equipment		2,915	81,704
Proceeds from disposal of intangible assets		15,343	125
Government grants received		33,069	163,934
Proceeds from disposal of assets held for sale		1,402	-
Proceeds from transfer of business		-	584,087
Increase in other receivables		(5,050,466)	(18,956)
Increase in other non-current receivables		(26,824)	(20,853)
Acquisition of financial assets		(29,502)	(63,767)
Acquisition of property, plant and equipment		(2,181,831)	(1,178,639)
Acquisition of intangible assets		(47,882)	(28,521)
Cash outflows from transfer of business		(6,565)	-
Net cash outflow from investing activities		(7,263,986)	(38,310)
Cash flows from financing activities			
Proceeds from borrowings		798,254	1,581,471
Capital contribution from non-controlling interests		12,854,293	110,339
Repayments of borrowings and others		(1,316,009)	(1,003,585)
Net cash inflow from financing activities		12,336,538	688,225
Net increase in cash and cash equivalents		5,228,688	1,716,119
Cash and cash equivalents at the beginning of the period		3,760,834	3,274,250
Effects of exchange rate changes on cash and cash equivalents		62,488	68,066
Cash and cash equivalents at the end of the period in the consolidated interim statement of financial position		9,052,010	5,058,435

The above consolidated interim statements of cash flows should be read in conjunction with the accompanying notes.

1. General Information

General information about LG Chem, Ltd. (the Parent Company) and its 58 subsidiaries (collectively referred to as "the Group") is as follows:

1.1 The Parent Company

The Parent Company was spun off on April 1, 2001, from LG Chem Investment Ltd. (now LG Corp., formerly LG Chemical Ltd.).

As at March 31, 2022, the Group has its manufacturing facilities in Yeosu, Daesan, Ochang, Cheongju, Ulsan, Naju, Iksan, Paju, Osong, Onsan, Gimcheon and overseas sites.

The Parent Company is authorized to issue 292 million shares of ordinary shares with par value of ₩5,000 per share. As at March 31, 2022, the Parent Company has issued and outstanding 70,592,343 ordinary shares (₩352,962 million) and 7,688,800 preferred shares (₩38,444 million). The largest shareholder of the Parent Company is LG Corp., which owns 33.34% of the Parent Company's ordinary shares. Preferred shareholders have no voting rights but are entitled to receive dividends at a rate 1% more than those paid to ordinary shareholders.

1.2 Business Overview

The Group is engaged in Petrochemicals, Energy solutions, and Advanced materials business, and also engaged in Life Sciences business acquired through a merger with LG Life Sciences, Ltd. in January 2017. In addition, the Parent Company acquired 100% shares of FarmHannong Co., Ltd., in April 2016, which is engaged to manufacture crop protection products, seeds, fertilizers and others.

The Petrochemical business includes production of olefin petrochemicals, such as ethylene, propylene, butadiene from Naphtha, and aromatic petrochemicals such as benzene. It also includes production of synthetic resin and synthetic components from olefin, and aromatic petrochemicals. This business bears characteristics of a large-volume process industry. The Group's major products are PE, PP, BPA, ABS, EP, PVC, plasticizers, acrylic, SAP, synthetic rubber, a special resin, and others.

LG Energy Solution, Ltd. which was established through the split-off of the Energy solution business from the Parent Company on December 1, 2020, and its subsidiaries mainly manufacture and supply batteries ranging from IT & New application batteries for mobile phones and laptop computers, to automotive batteries for electric vehicles and ESS (Energy Storage System) batteries. Demand of small-sized batteries for new applications such as electric tools and electric driving devices as well as traditional IT devices is increasing recently and the automotive battery business is also expected to expand rapidly due to an increasing demand of the batteries in associated with enhanced environment regulation in developed countries. Demand for ESS is expanding with an increasing importance of efficient usage of electricity and generation of renewable energy.

The Advanced material business manufactures and supplies various kinds of IT materials such as automotive material, OLED film, semiconductor materials, OLED materials, battery materials and others including RO membranes, which will be the next growth engine for future.

The Life Sciences business manufactures and supplies pharmaceutical products, such as human growth hormone 'Eutropin', diabetes drug 'Zemiglo', bovine somatotropin 'Boostin', hyaluronic acid filler 'YVOIRE' and others, as well as fine chemical products, such as herbicide 'PYANCHOR' for rice farming and others.

FarmHannong Co., Ltd. and its subsidiaries which were acquired by the Group in 2016 to manufacture and sell crop protection products, seeds, fertilizers and others. The crop protection business provides high value products such as environmentally-friendly pesticide. The fertilizer business leads developing a next generation fertilizers such as eco-friendly organic and functional fertilizers, and potting soil. The seed business puts priority on retaining various genetic resources and developing rare breeds with high profit in order to remain competitive in a future food industry.

1.3 Consolidated Subsidiaries, Associates and Joint Ventures

	March 31, 2022			
	Percentage of ownership (%)	Business location	Closing month	Business activities
Consolidated subsidiaries				
LG Energy Solution, Ltd.[1]	82	Korea	December	Battery manufacturing and sales
Ningbo LG Yongxing Chemical Co., Ltd.[2]	75	China	December	ABS/SBL manufacturing and sales
Ningbo Zhenhai LG Yongxing Trade Co., Ltd.[2]	75	China	December	ABS sales
LG Chem America, Inc	100	USA	December	Sales and trading
LG Chemical India Pvt. Ltd.[3, 5]	100	India	December	Synthetic resin manufacturing and sales
LG Polymers India Pvt. Ltd.[3, 6]	100	India	December	PS manufacturing and sales
LG Chemical (Guangzhou) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem (Taiwan), Ltd.	100	Taiwan	December	Polarizer manufacturing and sales
Tianjin LG Bohai Chemical Co., Ltd.	75	China	December	PVC, VCM, EDC manufacturing and sales
Tianjin LG BOTIAN Chemical Co., Ltd.	58	China	December	SBS manufacturing and sales
LG Chem (China) Investment Co., Ltd.[4, 7]	100	China	December	China holding company
LG Chem (Tianjin) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem Europe GmbH	100	Germany	December	Sales and trading
LG Chem Poland Sp. z o.o.	100	Poland	December	EP manufacturing and sales
LGC Petrochemical India Private Ltd.	100	India	December	Synthetic resin manufacturing and sales
HAENGBOKNURI CO., LTD.	100	Korea	December	Facility management and general cleaning
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	100	Turkey	December	Sales and trading
LG Chem Japan Co., Ltd.	100	Japan	December	Sales and trading
LG NanoH2O, LLC	100	USA	December	Water processing membrane sales
LG Chem (Chongqing) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	70	China	December	ABS manufacturing and sales
LG Chem Life Sciences India Pvt. Ltd.	100	India	December	Pharmaceutical products sales
LG Jiansheng Chem Life Sciences (Beijing) Co., Ltd.	60	China	December	Pharmaceutical products sales
LG Chem Life Sciences (Thailand) Ltd.	100	Thailand	December	Pharmaceutical products sales
LG Chem Hai Phong Vietnam Co., Ltd.	100	Vietnam	December	Polarizer manufacturing and sales
LG Chem Mexico S.A. de C.V.	100	Mexico	December	Sales and trading
LG Chem Hai Phong engineering Plastics LLC.	100	Vietnam	December	EP manufacturing and sales
LG Chem (Guangzhou) Information & Electronics Materials Co., Ltd.	100	China	December	Polarizer manufacturing and sales
LEYOU NEW ENERGY MATERIALS(WUXI) Co., LTD.	51	China	December	Battery materials manufacturing and sales
LG Chem Fund I LLC[8]	100	USA	December	Investments in venture companies
Uniseal,Inc.	100	USA	December	Adhesive manufacturing and sales
LG Chem Life Science Innovation Center, Inc.	100	USA	December	Pharmaceutical products research
LG Chem Asia Pte. Ltd.	100	Singapore	December	Asia BSC
LG Chem China Tech Center	100	China	December	Research on petrochemicals
Shanjin Optoelectronics (Taiwan) Co., Ltd.	100	Taiwan	December	Others

LG PETRONAS CHEMICALS Malaysia Sdn.Bhd.	51	Malaysia	December	NBL manufacturing and sales
LG Chem Hangzhou Advanced Materials Co., Ltd.	70	China	December	Polarizer sheet manufacturing and sales
LG BCM	100	Korea	December	Battery materials manufacturing and sales
LG Chem Ohio Petrochemical, Inc.	100	USA	December	ABS manufacturing and sales
LG Chem VietNam Co.,Ltd. [9]	100	Vietnam	December	Sales and trading
FarmHannong Co., Ltd. [10]	100	Korea	December	Agricultural pesticide manufacturing and sales
Farmhannong America, Inc. [10]	100	USA	December	Agricultural pesticide sales
FarmHannong(Thailand) Ltd. [10]	100	Thailand	December	Research and development on seeds
FARMHANNONG(MALAYSIA) SDN. BHD. [10]	100	Malaysia	December	Agricultural pesticide licensing
PT FARM HANNONG INDONESIA [10]	100	Indonesia	December	Agricultural pesticide licensing
FarmHannong do Brasil Limitada [10]	100	Brazil	December	Agricultural pesticide sales
LG Energy Solution (Nanjing) Co., Ltd.[1]	100	China	December	Battery manufacturing and sales
LG Energy Solution Michigan Inc. [1]	100	USA	December	Automotive battery research and manufacturing
LG Energy Solution Battery (Nanjing) Co., Ltd. [1]	100	China	December	Automotive battery manufacturing and sales
LG Energy Solution Wroclaw sp. z o.o. [1]	100	Poland	December	Automotive battery manufacturing and sales
LG Energy Solution Australia Pty Ltd[1]	100	Australia	December	ESS sales
LG Energy Solution Technology (Nanjing) Co., Ltd. [1]	100	China	December	Battery manufacturing and sales
Ultium Cells LLC [13]	50	USA	December	Automotive battery manufacturing and sales
LG Energy Solution Europe GmbH [1]	100	Germany	December	Sales and trading
LG Energy Solution (Taiwan), Ltd. [1]	100	Taiwan	December	Sales and trading
Aremnuri. Co. Ltd [1]	100	Korea	December	Facility management and general cleaning
LG Energy Solution Fund I LLC [1]	100	USA	December	Investments in venture companies
LG Energy Solution Vertech Inc. [1]	100	USA	December	ESS installation service
Associates				
TECHWIN Co., Ltd.	20	Korea	December	Environment solution and construction of chemical plant
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.[12]	100	Brazil	December	Sales and trading
LG Chem Malaysia SDN.BHD.[12]	100	Malaysia	December	Sales and trading
LG Chem Life Sciences Poland Ltd.[12]	100	Poland	December	Pharmaceutical products sales
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	49	China	December	Battery materials manufacturing and sales
TL Chemical CO., Ltd	40	Korea	December	AN manufacturing and sales
VINFAST LITHIUM BATTERY PACK LLC. [1]	35	Vietnam	December	Battery manufacturing and sales
Jiangxi VL Battery., Ltd. [1]	34	China	December	Battery manufacturing and sales
Joint ventures				
VINA Plasticizers Chemical Co.,Ltd.	50	Vietnam	December	DOP production and sales
SEETEC Co., Ltd.	50	Korea	December	Plant utility and distribution, research assistance service
PT.HLI Greenpower Co., Ltd. [1, 11]	50	Indonesia	December	Automotive battery manufacturing and sales

[1] These are LG Energy Solution and its subsidiaries, associates, and joint venture. As at March 31, 2022, the Parent Company's percentage of ownership decreased to 82% due to IPO and sale of existing shares during the three-month period ended March 31, 2022.
[2] As at March 31, 2022, Ningbo LG Yongxing Chemical Co., Ltd. owns 100% of Ningbo Zhenhai LG Yongxing Trading Co., Ltd.'s shares.
[3] As at March 31, 2022, LG Chemical India Pvt. Ltd. owns 100% of LG Polymers India Pvt. Ltd.'s shares.
[4] As at March 31, 2022, LG Chem (China) Investment Co., Ltd. owns 100% of LG Chem China Tech Center's shares.

[5] During the three-month period ended March 31, 2022, the Parent Company additionally acquired shares of LG Chemical India Pvt. Ltd. for ₩30,789 million.
[6] During the three-month period ended March 31, 2022, the Parent Company additionally acquired shares of LG Polymers India Pvt. Ltd. for ₩17,820 million.
[7] During the three-month period ended March 31, 2022, LG Chem (China) Investment Co., Ltd. decreased its capital with consideration of ₩240,480 million.
[8] During the three-month period ended March 31, 2022, the Parent Company additionally acquired shares of LG CHEM FUND I LLC for ₩14,154 million.
[9] LG Chem Vietnam Co., Ltd. was newly established during the three-month period ended March 31, 2022, and the Parent Company newly acquired 100% shares of LG Chem Vietnam Co., Ltd. for ₩359 million.
[10] As at March 31, 2022, FarmHannong Co., Ltd. owns 100% of Farmhannong America, Inc., FarmHannong(Thailand) Ltd., FARMHANNONG(MALAYSIA) SDN.BHD., and PT FARM HANNONG INDONESIA's shares.
[11] PT.HKML Battery Indonesia was newly established in accordance with a joint arrangement in which the Group participated during the year ended December 31, 2021. This investment is classified as a joint venture since the joint arrangement is structured through a separate vehicle and the Group has rights to the net assets of the arrangement.
[12] Classified as an investment in associate due to its small size.
[13] The Group possesses control over Ultium Cells LLC as the Group can exercise the majority voting rights in its decision-making process and has the ability to use power to affect the returns of the investee through its involvement in the production and cost management and other activities in accordance with the shareholders' agreement.

1.4 Summarized Financial Information of Subsidiaries, Associates and Joint Ventures

Summarized financial information (before elimination of intercompany transactions and adjustments for differences in accounting policies) of subsidiaries, associates and joint ventures is as follows:

(in millions of Korean won)	March 31, 2022			2022	
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the period
Subsidiaries					
LG Energy Solution, Ltd.[1,2]	34,975,888	15,536,318	19,439,570	4,342,348	226,622
Ningbo LG Yongxing Chemical Co.,Ltd.	1,371,854	142,797	1,229,057	601,040	69,965
Ningbo Zhenhai LG Yongxing Trade Co.,Ltd.	6,583	284	6,299	8,009	124
LG Chem America, Inc.	518,561	477,334	41,227	321,818	(2,091)
LG Chemical India Pvt. Ltd.	63,442	19	63,423	-	(274)
LG Polymers India Pvt. Ltd.	56,774	32,481	24,293	1,383	(1,208)
LG Chemical (Guangzhou) Engineering Plastics Co.,Ltd.	118,557	46,726	71,831	58,590	864
LG Chem (Taiwan), Ltd.	102,890	29,423	73,467	27,015	1,804
Tianjin LG Bohai Chemical Co.,Ltd.	500,033	76,062	423,971	142,002	13,652
Tianjin LG BOTIAN Chemical Co.,Ltd.	51,522	22,590	28,932	36,580	1,699
LG Chem (China) Investment Co.,Ltd.	1,277,788	812,451	465,337	18,143	1,765
LG Chem (Tianjin) Engineering Plastics Co.,Ltd.	59,968	13,687	46,281	22,390	2,002
LG Chem Europe GmbH	517,104	434,058	83,046	263,691	13,052
LG Chem Poland Sp. z o.o.	229,809	140,550	89,259	72,861	1,563
LGC Petrochemical India Private Ltd.	4,945	834	4,111	1,385	172
HAENGBOKNURI CO., LTD.	4,097	1,023	3,074	2,046	(45)
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	27,145	28,570	(1,425)	14,395	(1,225)
LG Chem Japan Co.,Ltd.	4,910	1,049	3,861	1,189	289
LG NanoH2O, LLC[3]	57,114	25,030	32,084	24,793	1,972
LG Chem (Chongqing) Engineering Plastics Co.,Ltd.	51,788	16,416	35,372	21,541	760

LG Chem(HUIZHOU) Petrochemical Co., Ltd.	620,257	166,814	453,443	265,995	25,415
LG Chem Life Sciences India Pvt. Ltd.	3,356	2,301	1,055	1,582	104
LG Jiansheng Life Sciences (Beijing) Co.,Ltd.	13,374	7,931	5,443	6,966	473
LG Chem Life Sciences (Thailand) Ltd.	25,473	9,407	16,066	10,383	917
LG Chem Hai Phong Vietnam Company Ltd.	14,509	3,597	10,912	4,833	626
LG Chem Mexico S.A. de C.V.	1,679	231	1,448	667	67
LG Chem Hai Phong Engineering Plastics Ltd.	29,203	13,048	16,155	9,135	103
LG Chem (Guangzhou) Information & Electronics Materials Co.,Ltd.[2]	297,820	84,650	213,170	44,112	512
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD	713,124	238,759	474,365	252,510	29,115
LG Chem Fund I LLC	61,385	27	61,358	-	(804)
Uniseal,Inc.[3]	40,410	8,019	32,391	20,367	15
LG Chem Life Science Innovation Center, Inc.	3,609	1,152	2,457	1,923	116
LG Chem Asia Pte. Ltd.	2,631	1,767	864	824	(1)
LG Chem China Tech Center	35,476	597	34,879	858	255
Shanjin Optoelectronics (Taiwan) Co., Ltd.	58,690	31	58,659	131	39
LG PETRONAS CHEMICALS Malaysia Sdn.Bhd.	140,270	67,417	72,853	-	(740)
LG Chem Hangzhou Advanced Materials Co., Ltd.[3]	77,035	41,946	35,089	39,242	492
LG BCM	59,276	7,543	51,733	-	(1,080)
LG Chem Ohio Petrochemical, Inc.	26,527	3,489	23,038	-	3
LG Chem VietNam Co.,Ltd	267	1	266	-	(95)
FarmHannong Co., Ltd.[1,3]	1,192,845	772,151	420,694	260,833	31,032
Associates					
TECHWIN Co., Ltd.	132,871	45,377	87,494	9,764	(3,406)
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR Q UIMICO LTDA.	1,012	153	859	486	89
LG Chem Malaysia SDN.BHD.	508	2	506	472	31
LG Life Sciences Poland Ltd.	212	70	142	46	25
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	459,080	263,786	195,294	38,413	(1,213)
TL Chemical CO., Ltd	121,795	435	121,360	-	223
VINFAST LITHIUM BATTERY PACK LLC.	17,312	6,177	11,135	3,106	(330)
Jiangxi VL Battery.,Ltd	90,497	33,600	56,897	5,236	(3,998)
Joint ventures					
Vina Plasticizer Chemical Co.,Ltd.	81,058	52,586	28,472	51,674	2,804
SEETEC Co., Ltd.	314,880	46,744	268,136	164,165	2,098
PT.HLI Green Power	400,829	980	399,849	-	(11,669)

[1] Represent financial information of intermediate parent company consolidating its subsidiaries.
[2] LCD polarizer business and others of these entities was classified as discontinued operations and profit or loss from the business was included in profit from discontinued operations (Note 34).
[3] Fair value adjustments due to business combination recorded in the consolidated financial statements are not included in the above information.

(in millions of Korean won)	March 31, 2021			2021	
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the period
Subsidiaries					
LG Energy Solution, Ltd.[1,2]	23,764,139	15,021,765	8,742,374	4,254,116	442,970
Ningbo LG Yongxing Chemical Co.,Ltd.	1,394,894	258,879	1,136,015	583,579	135,912
Ningbo Zhenhai LG Yongxing Trade Co.,Ltd.	6,787	735	6,052	6,713	139
LG Chem America, Inc.	408,469	366,034	42,435	194,058	3,370
LG Chemical India Pvt. Ltd.	32,799	35	32,764	-	3
LG Polymers India Pvt. Ltd.	44,118	36,206	7,912	245	(4,325)
LG Chemical (Guangzhou) Engineering Plastics Co.,Ltd.	119,231	42,590	76,641	63,230	3,297
LG Chem (Taiwan), Ltd.	109,772	35,905	73,867	28,486	870
LG Chem Display Materials (Beijing) Co.,Ltd.[2]	-	-	-	-	276
Tianjin LG Bohai Chemical Co.,Ltd.	530,055	127,935	402,120	146,222	23,302
Tianjin LG BOTIAN Chemical Co.,Ltd.	46,289	19,597	26,692	28,287	360
LG Chem (China) Investment Co.,Ltd.	1,371,751	679,206	692,545	13,690	2,551
LG Chem (Tianjin) Engineering Plastics Co.,Ltd.	56,898	12,011	44,887	18,755	1,556
LG Chem Europe GmbH	358,459	288,909	69,550	118,937	5,910
LG Chem Poland Sp. z o.o.	222,263	133,527	88,736	36,883	4,830
LGC Petrochemical India Private Ltd.	4,918	988	3,930	934	135
HAENGBOKNURI CO., LTD.	4,503	1,385	3,118	2,838	(2)
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	10,416	10,685	(269)	6,939	(195)
LG Chem Japan Co.,Ltd.	5,109	1,391	3,718	1,519	143
LG NanoH2O, LLC[3]	44,449	14,978	29,471	13,448	1,451
LG Chem (Chongqing) Engineering Plastics Co.,Ltd.	49,879	15,955	33,924	19,324	1,423
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	574,744	155,233	419,511	233,520	46,974
LG Chem Life Sciences India Pvt. Ltd.	3,191	2,242	949	1,143	98
LG Jiansheng Life Sciences (Beijing) Co.,Ltd.	11,742	6,854	4,888	439	20
LG Chem Life Sciences (Thailand) Ltd.	25,708	10,875	14,833	9,014	795
LG Chem Hai Phong Vietnam Company Ltd.	14,571	4,458	10,113	8,240	(606)
LG Chem Mexico S.A. de C.V.	1,619	267	1,352	415	54
LG Chem Hai Phong Engineering Plastics Ltd.	31,476	15,698	15,778	7,318	263
LG Chem (Guangzhou) Information & Electronics Materials Co.,Ltd.[2]	317,592	109,131	208,461	34,978	(271)
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD	608,961	172,607	436,354	138,830	16,635
LG Chem Fund I LLC	45,922	9	45,913	-	(1,026)
Ugimag Korea Co., Ltd.[2]	-	-	-	5,338	(1,344)
Uniseal,Inc.[3]	38,635	6,932	31,703	16,905	495
LG Chem Life Science Innovation Center, Inc.	3,446	1,153	2,293	1,403	85
LG Chem Asia Pte. Ltd.	2,927	2,079	848	-	(66)
LG Chem China Tech Center	34,327	390	33,937	-	-
Shanjin Optoelectronics (Taiwan) Co., Ltd.	59,149	5	59,144	-	-
LG PETRONAS CHEMICALS Malaysia Sdn.Bhd.	123,502	50,961	72,541	-	-
LG Chem Hangzhou Advanced Materials Co., Ltd.	112,892	78,981	33,911	-	-
LG BCM	54,412	1,599	52,813	-	-
LG Chem Ohio Petrochemical, Inc.	24,132	1,578	22,554	-	-
FarmHannong Co., Ltd.[1,3]	1,047,277	657,687	389,590	210,913	20,744
Associates					
TECHWIN Co., Ltd.	142,066	51,893	90,173	-	-
LG Chem BRASIL INTERMEDIACAO DE	729	91	638	378	69

NEGOCIOS DO SETOR Q UIMICO LTDA.					
LG Chem Malaysia SDN.BHD.	525	2	523	155	19
FJ Composite Material Co., Ltd.	-	-	-	101	(58)
WUXI CL New Energy Technology Ltd.	-	-	-	-	(19)
LG Life Sciences Poland Ltd.	188	70	118	57	3
Combustion Synthesis Co., Ltd.	-	-	-	35	(115)
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	422,366	229,745	192,621	-	(680)
TL Chemical CO., Ltd	121,551	369	121,182	-	-
VINFAST LITHIUM BATTERY PACK LLC.	17,496	6,295	11,201	3,119	(308)
Jiangxi VL Battery.,Ltd	76,495	16,799	59,696	-	(940)
Joint ventures					
VINA Plasticizer Chemical Co., Ltd.	64,237	39,721	24,516	35,936	4,289
SEETEC Co., Ltd.	328,396	52,384	276,012	124,224	3,985
HL Greenpower Co., Ltd.	-	-	-	215,930	289
PT.HLI Green Power	404,131	1,156	402,975	-	-

[1] Represent financial information of intermediate parent company consolidating its subsidiaries.
[2] LCD polarizer business and others of these entities was classified as discontinued operations and profit or loss from the business was included in profit from discontinued operations (Note 34).
[3] Fair value adjustments due to business combination recorded in the consolidated financial statements are not included in the above information.

1.5 Information of Non-Controlling Interests that are Material to the Group

(a) LG Energy Solution and its subsidiaries

- Percentage of ownership held by non-controlling interests and accumulated non-controlling interests

(in millions of Korean won)	**March 31, 2022**
Percentage of ownership held by non-controlling interests	18.2%
Accumulated non-controlling interests	4,373,494

- Profit and dividends attributable to non-controlling interests for the three-month period ended March 31, 2022, are as follows:

(in millions of Korean won)	**2022**
Profit allocated to non-controlling interests	40,144
Dividends paid to non-controlling interests	-

Summarized consolidated statements of financial positions of subsidiaries with material non-controlling interests, are as follows (before elimination of intercompany transaction):

(in millions of Korean won)	**March 31, 2022**
Current assets	19,663,197
Non-current assets	15,312,691
Total assets	34,975,888
Current liabilities	10,383,145
Non-current liabilities	5,153,173
Total liabilities	15,536,318
Total equity	19,439,570

Summarized consolidated statements of comprehensive income of subsidiaries with material non-controlling interests for the three-month period ended March 31, 2022, are as follows (before elimination of intercompany transaction):

(in millions of Korean won)	**2022**
Revenue	4,342,348
Profit for the period	226,622
Total comprehensive income	367,023

Summarized consolidated statements of cash flows of subsidiaries with material non-controlling interests for the three-month period ended March 31, 2022, are as follows (before elimination of intercompany transaction):

(in millions of Korean won)	**2022**
Cash flows from operating activities	398,779
Cash flows from investing activities	(6,525,414)
Cash flows from financing activities	9,960,205
Net increase in cash and cash equivalents	3,833,570
Cash and cash equivalents at beginning of the period	1,282,880
Effects of exchange rate changes on cash and cash equivalents	44,804
Cash and cash equivalents at end of the period	5,161,254

1.6 Changes in Scope for Consolidation

Subsidiaries newly included in the consolidation for the three-month period ended March 31, 2022, are as follows:

Subsidiary	Reason
LG Energy Solution Vertech Inc.	Newly acquired
LG Chem VietNam Co.,Ltd	Newly established

2. Summary of Significant Accounting Policies

The principal accounting policies applied in the preparation of these consolidated interim financial statements are set out below. These policies have been consistently applied to all the periods presented, unless otherwise stated.

2.1 Basis of Preparation

The Group maintains its accounting records in Korean won and prepares statutory financial statements in the Korean language (Hangul) in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (Korean IFRS). The accompanying consolidated interim financial statements have been condensed, restructured and translated into English from the Korean language financial statements.

The Group's consolidated interim financial statements for the three-month period ended March 31, 2022, have been prepared in accordance with Korean IFRS 1034 *Interim Financial Reporting*. These consolidated interim financial statements have been prepared in accordance with Korean IFRS which is effective or early adopted as at March 31, 2022.

(a) New and amended standards adopted by the Group

The Group has applied the following standards for the first time for their annual reporting period commencing January 1, 2022.

- Amendment to Korean IFRS 1116 Leases - Covid-19 - Related Rent Concessions beyond June 30, 2021

The application of the practical expedient, a lessee may elect not to assess whether a rent concession occurring as a direct consequence of the COVID-19 pandemic is a lease modification, is extended to lease payments originally due on or before June 30, 2022. A lessee shall apply the practical expedient consistently to eligible contracts with similar characteristics and in similar circumstances. The amendment does not have a significant impact on the consolidated interim financial statements.

- Amendments to Korean IFRS 1103 Business Combination – Reference to the Conceptual Framework

The amendments update a reference of definition of assets and liabilities to be recognized in a business combination in revised Conceptual Framework for Financial Reporting. However, the amendments add an exception for the recognition of liabilities and contingent liabilities within the scope of Korea IFRS 1037 *Provisions, Contingent Liabilities and Contingent Assets*, and Korean IFRS 2121 *Levies*. The amendments also clarify that contingent assets should not be recognized at the acquisition date. The amendments should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The amendment does not have a

significant impact on the consolidated interim financial statements.

- Amendments *to Korean IFRS 1016 Property, Plant and Equipment - Proceeds before intended use*

The amendments prohibit an entity from deducting from the cost of an item of property, plant and equipment any proceeds from selling items produced while the entity is preparing the asset for its intended use. Instead, the entity will recognize the proceeds from selling such items, and the costs of producing those items, in profit or loss. The amendment does not have a significant impact on the consolidated interim financial statements.

- Amendments to Korean IFRS 1037 Provisions, Contingent Liabilities and Contingent Assets - Onerous Contracts: Cost of Fulfilling a Contract

The amendments clarify that the direct costs of fulfilling a contract include both the incremental costs of fulfilling the contract and an allocation of other costs directly related to fulfilling contracts when assessing whether the contract is onerous. The amendment does not have a significant impact on the consolidated interim financial statements.

- Annual improvements to Korean IFRS 2018-2020

Annual improvements of Korean IFRS 2018-2020 Cycle should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The amendment does not have a significant impact on the consolidated interim financial statements.

- Korean IFRS 1101 *First time Adoption of Korean International Financial Reporting Standards* – Subsidiaries that are first-time adopters

- Korean IFRS 1109 *Financial Instruments* – Fees related to the 10% test for derecognition of financial liabilities

- Korean IFRS 1041 *Agriculture* – Measuring fair value

(b) New and amended standards not yet adopted by the Group

The following new and amended accounting standards and interpretations that have been published that are not mandatory for March 31, 2022 reporting periods and have not been early adopted by the Group.

- Amendments to Korean IFRS 1001 Presentation of Financial Statements - Classification of Liabilities *as Current or Non-current*

The amendments clarify that liabilities are classified as either current or non-current, depending on the substantive rights that exist at the end of the reporting period. Classification is unaffected by the likelihood that an entity will exercise right to defer settlement of the liability or the expectations of management. Also, the settlement of liability includes the transfer of the entity's own equity instruments, however, it would be excluded if an option to settle them by the entity's own equity instruments if compound financial instruments is met the definition of equity instruments and recognized separately from the liability. The amendments should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted. The Group is in review for the impact of these amendments on the consolidated interim financial statements.

- Korean IFRS 1001 Presentation of Financial Statements - Disclosure of Accounting Policies

The amendments to Korean IFRS 1001 define and require entities to disclose their material accounting policies. The IASB amended IFRS Practice Statement 2 *Disclosure of Accounting Policies* to provide guidance on how to apply the concept of materiality to accounting policy disclosures. The amendments should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted. The Group is in review for the impact of these amendments on the consolidated interim financial statements.

- Korean IFRS 1008 Accounting policies, changes in accounting estimates and errors - Definition of Accounting Estimates

The amendments define accounting estimates and clarify how to distinguish them from changes in accounting policies. The amendments should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the consolidated interim financial statements.

- Korean IFRS 1012 *Income Taxes - Deferred Tax related to Assets and Liabilities arising from a Single Transaction*

The amendments include an additional condition to the exemption to initial recognition of an asset or liability that a transaction does not give rise to equal taxable and deductible temporary differences at the time of the transaction. The amendments should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the consolidated interim financial statements.

- New Standard: Korean IFRS 1117 Insurance Contract

Korean IFRS 1117 *Insurance Contracts* replaces Korean IFRS 1104 *Insurance Contracts*. This Standard estimates future cash flows of an insurance contract and measures insurance liabilities using discount rates applied with assumptions and risks at the measurement date. The entity recognizes insurance revenue on an accrual basis including services (insurance coverage) provided to the policyholder by each annual period. In addition, investment components (Refunds due to termination/maturity) repaid to a policyholder even if an insured event does not occur, are excluded from insurance revenue, and insurance financial income or expense and the investment income or expense are presented separately to enable users of the information to understand the sources of income or expenses. This Standard should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted for entities that applied Korean IFRS 1109 *Financial Instruments*. The Group does not expect that these amendments have a significant impact on the consolidated interim financial statements.

2.2 Significant Accounting Policies

Significant accounting policies and method of computation used in the preparation of the condensed consolidated interim financial statements are consistent with those of the consolidated financial statements for the year ended December 31, 2021, except for the changes due to the application of amendment and enactments of standards described in Note 2.1.(a) and the ones described below.

2.2.1 Income Tax Expense

Income tax expense for the interim period is recognized based on management's best estimate of the weighted average annual income tax rate expected for the full financial year. The estimated average annual tax rate is applied to the pre-tax income.

3. Financial Risk Management

3.1 Financial Risk Factors

The Group's activities expose it to a variety of financial risks: market risk, credit risk and liquidity risk. The Group's overall risk management program focuses on the unpredictability of financial markets and seeks to minimize potential adverse effects on the financial performance of the Group. The Group uses derivative financial instruments to hedge certain risk exposures.

Risk management is carried out by the Group's finance team under policies approved by the Corporate Management Committee. The finance team identifies, evaluates and hedges financial risks in close co-operation with the Group's operating units. The Corporate Management Committee reviews and approves written principles for overall risk management, as well as written policies covering specific areas, such as foreign exchange risk, interest rate risk, and credit risk, use of derivative financial instruments and non-derivative financial instruments, investment of excess liquidity.

(1) Market risk

1) Foreign exchange risk

The Group operates internationally and is exposed to foreign exchange risk arising from foreign currency exposures, primarily with respect to the US dollar. Foreign exchange risk arises from future commercial transactions, recognized assets and liabilities.

Management has set up a policy to require group companies to manage their foreign exchange risk against their functional currency. The Group manages maximum loss for currency risk exposures within acceptable range by using currency risk management model and hires employees who are exclusively responsible for currency risk management.

The Group has certain investments in foreign operations, whose net assets are exposed to foreign currency translation risk. Currency exposure arising from the net assets of the Group's foreign operations is managed primarily through borrowings denominated in the relevant foreign currencies.

As at March 31, 2022 and December 31, 2021, the Group's monetary assets and liabilities denominated in currencies other than its functional currency, are as follows:

(in millions of Korean won)	March 31, 2022		December 31, 2021	
	Assets	Liabilities	Assets	Liabilities
USD	5,714,457	6,596,254	5,708,219	5,741,611
EUR	364,500	4,904,182	441,123	4,804,639
JPY	8,643	202,045	18,315	96,238
CNY and others	328,365	3,820	523,907	4,131

As at March 31, 2022 and December 31, 2021, if the Group's functional currency had weakened / strengthened by 10% against the US dollar and Euro with all other variables held constant, profit before income tax would have been affected as follows:

(in millions of Korean won)	March 31, 2022		December 31, 2021	
	10% Increase	10% Decrease	10% Increase	10% Decrease
USD	(39,821)	39,821	31,708	(31,708)
EUR	(417,406)	417,406	(413,462)	413,462

The above sensitivity analysis has been performed for monetary assets and liabilities denominated in foreign currencies other than the Group's functional currency at the reporting date.

As at March 31, 2022 and December 31, 2021, the Group entered into foreign currency forward and currency swap contracts to manage risk from changes in exchange rates and the details are as follows:

(in millions of Korean won and in millions of US dollars)

	March 31, 2022						
	Contractor	Contract amount	Contract exchange rate	Contract inception date	Contract maturity	Book amount	
						Assets	Liabilities
Currency Forward[1]	KDB	USD 35	1,135.60	2021.6.24	2022.6.24	2,590	-
	Shinhan Bank	USD 500	1,135.60	2020.10.14	2024.10.15	28,241	-
	KB Kookmin Bank	USD 500	1,102.83	2020.11.24	2029.4.16	33,945	-
	Citi	EUR 150	4.5900[2]	2021.5.12	2022.4.29	3,438	-
	SC	EUR 250	4.5861[2]	2021.5.14	2022.4.29	5,116	-
	CACIB	EUR 100	4.6055[2]	2021.8.5	2022.8.4	3,302	-
	KDB	EUR 165	4.6036[2]	2021.8.5	2022.8.4	5,902	-
	ING	EUR 100	4.7120[2]	2021.10.22	2022.10.21	2,455	-
	ING	EUR 100	4.7800[2]	2022.1.5	2023.1.5	2,224	-
Currency swap	SMBC	USD 200	1,118.00	2021.5.28	2024.5.28	15,417	-
	KDB	USD 130	1,135.60	2021.6.24	2025.6.24	16,465	-
	KDB	USD 35	1,135.60	2021.6.24	2026.6.24	4,740	-
	Shinhan Bank	USD 300	1,131.80	2021.7.7	2026.7.7	16,061	-
	Woori Bank	USD 100	1,131.80	2021.7.7	2026.7.7	5,666	-
	Industrial and Commercial Bank of China	USD 100	1,131.80	2021.7.7	2026.7.7	5,750	-
	Shinhan Bank	USD 100	1,131.80	2021.7.7	2031.7.7	6,710	-
	Woori Bank	USD 200	1,131.80	2021.7.7	2031.7.7	14,084	-
	KDB	USD 200	1,131.80	2021.7.7	2031.7.7	14,161	-

(in millions of Korean won and in millions of US dollars)

	December 31, 2021						
	Contractor	Contract amount	Contract exchange rate	Contract inception date	Contract maturity	Book amount	
						Assets	Liabilities
Currency Forward[1]	KDB	USD 35	1,135.60	2021.6.24	2022.6.24	1,789	-
	Shinhan Bank	USD 500	1,135.60	2020.10.14	2024.10.15	24,687	-
	KB Kookmin Bank	USD 500	1,102.83	2020.11.24	2029.4.16	30,232	-
	Citi	EUR 150	4.5900[2]	2021.5.12	2022.4.29	2,881	-
	SC	EUR 250	4.5861[2]	2021.5.14	2022.4.29	4,703	-

	CACIB	EUR 100	4.6055[2]	2021.8.5	2022.8.4	2,964	-
	KDB	EUR 165	4.6036[2]	2021.8.5	2022.8.4	4,925	-
	ING	EUR 100	4.7120[2]	2021.10.22	2022.10.21	1,420	-
Currency swap	SMBC	USD 200	1,118.00	2021.5.28	2024.5.28	13,556	-
	KDB	USD 130	1,135.60	2021.6.24	2025.6.24	8,817	-
	KDB	USD 35	1,135.60	2021.6.24	2026.6.24	2,319	-
	Shinhan Bank	USD 300	1,131.80	2021.7.7	2026.7.7	12,196	-
	Woori Bank	USD 100	1,131.80	2021.7.7	2026.7.7	4,380	-
	Industrial and Commercial Bank of China	USD 100	1,131.80	2021.7.7	2026.7.7	4,653	-
	Shinhan Bank	USD 100	1,131.80	2021.7.7	2031.7.7	4,804	-
	Woori Bank	USD 200	1,131.80	2021.7.7	2031.7.7	10,032	-
	KDB	USD 200	1,131.80	2021.7.7	2031.7.7	10,429	-

[1] Derivatives that are not qualified for hedge accounting.
[2] Cross exchange rate between PLN and EUR.

2) Price risk

The Group is exposed to equity securities price risk arises from investments held by the Group and classified in the consolidated interim statement of financial position as non-current financial assets. The Group's equity investments are publicly traded and are related to the NASDAQ and ASX index.

The table below summarizes the impact of increases/decreases of the listed stock price index on the Group's equity before tax effects as at March 31, 2022 and December 31, 2021. The analysis is based on the assumption that the equity index has increased/decreased by 10% with all other variables held constant, and that all the Group's equity instruments moved in line with the index.

(in millions of Korean won)	**March 31, 2022**		**December 31, 2021**	
	10% Increase	**10% Decrease**	**10% Increase**	**10% Decrease**
NASDAQ	(48)	48	909	(909)
ASX	2,230	(2,230)	676	(676)
Total	2,182	(2,182)	1,585	(1,585)

3) Interest rate risk

Interest rate risk is defined as the risk that the interest income or expenses arising from deposits and borrowings will fluctuate because of changes in future market interest rate. The interest rate risk mainly arises through floating rate deposits and borrowings. The objective of interest rate risk management lies in maximizing corporate value by minimizing uncertainty in interest rates fluctuations and net interest expense.

The Group adequately minimizes risks from interest rate fluctuations through various policies, such as sharing excess cash within the Group (internal cash sharing) to minimize external borrowings, avoiding high rate borrowings, reforming capital structure, managing an appropriate ratio of fixed rate borrowings and floating rate borrowings, monitoring a fluctuation of domestic and foreign interest rates daily, weekly and monthly, establishing alternatives, and balancing floating rate short-term borrowings with floating rate deposits.

The table below summarizes the impact of increases/decreases of interest rate on the Group's equity and post-tax profit for the three-month periods ended March 31, 2022 and 2021. The analysis is based on the assumption that the interest rate has increased/decreased by 1% (100 basis points) with all other variables held constant.

(in millions of Korean won)	Impact on post-tax profit		Impact on equity	
	2022	2021	2022	2021
Increase	(42,144)	(37,095)	(42,144)	(37,095)
Decrease	42,144	37,095	42,144	37,095

The Group has entered into a currency interest rate swap contract amounting to USD 165 million (equivalent to ₩199,782 million) to hedge interest rate risk of variable interest rate borrowings from Korea Development Bank and others.

(2) Credit risk

Credit risk arises from trade receivables and that the Group holds, as well as debt instruments at amortized cost or fair value through other comprehensive income.

1) Trade receivables

The Group applies the simplified approach to measuring expected credit losses which uses a lifetime expected loss allowance for trade receivables. To measure the expected credit losses, trade receivables have been grouped based on shared credit risk characteristics and the days past due. The loss allowance provision as at March 31, 2022 is as follows. Expected credit losses include forward-looking information.

(in millions of Korean won)	Receivables not past due[1]	Receivables past due but not impaired[1]	Impaired receivables[2]	Total
March 31, 2022 (trade receivables)				
Gross carrying amount	6,903,108	192,869	2,688	7,098,665
Expected loss rate	0.0%	0.3%	49.8%	0.1%
Loss allowance provision	3,122	573	1,338	5,033
December 31, 2021 (trade receivables)				
Gross carrying amount	6,118,779	338,693	1,656	6,459,128
Expected loss rate	0.1%	0.2%	81.5%	0.1%
Loss allowance provision	3,152	592	1,350	5,094

[1] See Note 7.(3) for aging analysis.
[2] Impaired receivables are those for which impairment indicators have been confirmed, such as significant lack of collectability.

Movements in the loss allowance provision for trade receivables for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	Trade receivables	
	March 31, 2022	**December 31, 2021**
Beginning balance	5,094	4,391
Increase in reversal of loss allowance recognized in profit or loss	(489)	(127)
Receivables written off as uncollectible	-	(447)
Exchange differences	428	1,277
Ending balance	5,033	5,094

As at March 31, 2022, the carrying amount of trade receivables representing the maximum exposure to credit risk amounts to ₩7,093,632 million (December 31, 2021: ₩6,454,034 million).

2) Other financial assets at amortized cost

Movements in loss allowance provision for other financial assets at amortized cost for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	Other receivables	
	March 31, 2022	**December 31, 2021**
Beginning balance	2,165	2,165
Increase in loss allowance recognized as 'other non-operating expenses' in profit or loss	-	-
Exchange differences	-	-
Ending balance	2,165	2,165

All of the financial assets at amortized costs are considered to have low credit risk, and the loss allowance recognized during the period was, therefore, limited to 12 months expected losses.

The Group has established the following policies and procedures to manage credit risks.

To manage credit risks relating to trade receivables, the Group evaluates the credit rating of customers and determines credit limit for each customer based on the information provided by credit rating agencies and other available financial information before commencing business with new customers. The credit risks relating to trade receivables are also mitigated by insurance contracts, collateral as well as payment guarantees.

The Group has entered into export bond insurance contracts with Korea Trade Insurance Corporation to mitigate credit risks relating to export trade receivables to overseas customers. The Group is also provided with collateral by customers depending on their credit rating or payment guarantees from the customers' financial institutions if necessary.

The Group has deposited its cash and cash equivalents and other long-term deposits in several financial institutions, such as Woori Bank and others. The Group has also entered into derivative contract with several financial institutions. The Group maintains business relationship with those financial institutions with high credit ratings evaluated by independent credit rating agencies and

accordingly, credit risks associated with these financial institutions are limited.

(3) Liquidity risk

Finance team of the Group monitors rolling forecasts of the Group's liquidity requirements to ensure it has sufficient cash to meet operational needs while maintaining sufficient headroom on its undrawn committed borrowing facilities at all times so that the Group does not breach borrowing limits or covenants (where applicable) on any of its borrowing facilities. The Group's liquidity management policy involves projecting cash flows in major currencies and considering the level of liquid assets necessary to meet these, monitoring balance sheet liquidity ratios against internal and external regulatory requirements and maintaining debt financing plans.

The table below analyzes the Group's financial liabilities into relevant maturity groupings based on the remaining period at the reporting period to the contractual maturity date. Cash flows presented below are gross cash flows before discount, and includes cash flows for interests.

(in millions of Korean won)	**March 31, 2022**			
	Less than 1 year	**Between 1-2 years**	**Between 2-5 years**	**Over 5 years**
Non-derivative financial instruments				
Borrowings (excluding lease liabilities)	4,443,335	2,431,302	4,974,539	3,469,279
Lease liabilities	84,977	59,475	91,206	149,349
Trade and other payables	7,893,596	14,237	1,694	172
Other current liabilities (dividends payable)	935,275	-	-	-
	13,357,183	2,505,014	5,067,439	3,618,800
Derivative instruments				
Gross settlement currency forwards and swaps				
(Inflows)	(1,260,076)	(29,700)	(1,713,293)	(1,255,463)
Outflows	1,232,189	26,842	1,607,739	1,174,727
	(27,887)	(2,858)	(105,554)	(80,736)
	13,329,296	2,502,156	4,961,885	3,538,064

(in millions of Korean won)	**December 31, 2021**			
	Less than 1 year	**Between 1-2 years**	**Between 2-5 years**	**Over 5 years**
Non-derivative financial instruments				
Borrowings (excluding lease liabilities)	3,548,442	2,403,648	5,984,843	3,551,215
Lease liabilities	82,568	54,416	87,498	156,494
Trade and other payables[1]	7,733,917	13,757	1,694	171
	11,364,927	2,471,821	6,074,035	3,707,880
Derivative instruments				
Gross settlement currency forwards and swaps				
(Inflows)	(1,096,082)	(27,579)	(1,690,054)	(1,255,889)

Outflows	1,096,734	26,825	1,613,263	1,181,161
	652	(754)	(76,791)	(74,728)
	11,365,579	2,471,067	5,997,244	3,633,152

[1] Included ₩301,946 million of financial liabilities due to a financial institution relating to reverse factoring arrangement as at December 31, 2021. The Group has entered into reverse factoring arrangement (interest rate CD 91 days + 0.93~1.20%) with a financial institution whereby suppliers receive payments from the financial institution on the due date of each invoice and the Group pays to the financial institution at the end of extended credit period as agreed in the reverse factoring arrangement. As at March 31, 2022, there is no utilized amount in the reverse factoring arrangement.

As at March 31, 2022, the Group has entered into swap contracts for which cash flow hedge accounting is applied, to avoid market price fluctuation of raw materials.

(in millions of Korean won)	March 31, 2022				
	Purpose of the contracts	**Hedged items**	**Financial institution**	**Maturity**	**Fair value**
Merchandise (raw materials) swap[1]	Cash flow hedge	Non-ferrous metal	Citibank and others	~2024. 12	64,652

Details of derivative assets and liabilities as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022		December 31, 2021	
	Assets	**Liabilities**	**Assets**	**Liabilities**
Merchandise (raw materials) swap[1]	64,652	-	5,911	126

[1] Gain (loss) resulting from the contracts to avoid cash flow fluctuation risk of expected future transaction is accounted for as accumulated other comprehensive income which corresponds to an effective portion of the hedges (Note 5).

3.2 Capital Risk Management

The Group's objectives for managing capital are to safeguard the Group's ability to continue as a going concern, so the Group can continue to provide returns for shareholders and benefits for other stakeholders, and to maintain an optimal capital structure to reduce the cost of capital.

Consistent with others in the industry, the Group monitors capital on the basis of the gearing ratio. This ratio is calculated as net debt divided by total capital. Net debt is calculated as total borrowings less cash and cash equivalents. Total capital is calculated as 'equity' as shown in the consolidated statement of financial position plus net debt.

The gearing ratio and debt-to-equity ratio as at March 31, 2022 and December 31, 2021, were as follows:

(in millions of Korean won, except for ratios)	**March 31, 2022**	**December 31, 2021**
Total borrowings (Note 14) (A)	14,694,152	14,765,734
Less: cash and cash equivalents (B)	(9,052,010)	(3,760,834)
Net debt (C=A+B)	5,642,142	11,004,900
Total liabilities (D)	28,926,355	27,925,314
Total equity (E)	35,491,100	23,209,988
Total capital (F=C+E)	41,133,242	34,214,888
Gearing ratio (C/F)	13.7%	32.2%
Debt-to-equity ratio (D/E)	81.5%	120.3%

3.3 Fair Value

(1) Carrying amount and fair value of financial instruments by category as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**		**December 31, 2021**	
	Carrying amount	**Fair value**	**Carrying amount**	**Fair value**
Financial assets (current)				
Cash and cash equivalents	9,052,010	[1]	3,760,834	[1]
Deposits held by financial institutions	5,085,518	[1]	64,583	[1]
Trade receivables	7,018,529	[1]	6,386,979	[1]
Other receivables (excluding deposits held by financial institutions)	1,227,734	[1]	983,966	[1]
Current derivative financial assets (currency forward)	25,027	25,027	18,683	18,683
Current derivative financial assets (excluding currency forward)	42,988	42,988	4,606	4,606
Financial assets (non-current)				
Deposits held by financial institutions	277,214	[1]	267,116	[1]
Trade receivables	75,103	[1]	67,055	[1]
Other receivables (excluding deposits held by financial institutions)	320,620	[1]	446,050	[1]
Other non-current financial assets (carried at fair value)				
Marketable financial assets	39,064	39,064	21,630	21,630
Non-marketable financial assets[2]	354,160	354,160	340,823	340,823
Non-current derivative financial assets (currency forward)	62,187	62,187	54,918	54,918
Non-current derivative financial assets (excluding currency forward)	137,223	137,223	88,651	88,651
Financial liabilities (current)				
Trade and other payables	7,893,596	[1]	7,733,916	[1]
Current borrowings	4,295,302	[1]	3,405,215	[1]

(in millions of Korean won)	March 31, 2022		December 31, 2021	
	Carrying amount	Fair value	Carrying amount	Fair value
(excluding lease liabilities)				
Current lease liabilities	74,857	[3]	71,865	[3]
Other current liabilities (dividend payable)	935,275	[1]	-	-
Financial liabilities (non-current)				
Non-current borrowings (excluding lease liabilities)	10,073,057	9,704,276	11,041,274	10,923,942
Non-current lease liabilities	250,936	[3]	247,380	[3]
Other non-current payables	16,103	[1]	15,623	[1]
Non-current derivative financial liabilities (excluding currency forward)	-	-	126	126

[1] These financial assets and liabilities are not included in the disclosure above as their carrying amount is a reasonable approximation of the fair value.
[2] Acquisition costs of these financial assets approximate their fair values.
[3] Fair values for these financial assets and liabilities are not disclosed above in accordance with related Korean IFRS.

(2) Fair value for measurement and disclosure are determined based on the following method:

Fair values of financial liabilities (non-current) are based on cash outflows discounted by using Korean won currency note yield in the same credit grade with the Parent Company (AA+), and the applied discount rates as at March 31, 2022 and December 31, 2021, are as follows:

(in percentage)	March 31, 2022	December 31, 2021
Discount rate	2.01% ~ 3.66%	1.77% ~ 2.99%

(3) Fair value hierarchy

Items that are measured at fair value are categorized by the fair value hierarchy levels, and the defined levels are as follows:

- Quoted prices (unadjusted) in active markets for identical assets or liabilities that an entity can access at the measurement date (Level 1).
- All inputs other than quoted prices included in level 1 that are observable (either directly that is, prices, or indirectly that is, derived from prices) for the asset or liability (Level 2).
- Unobservable inputs for the asset or liability (Level 3).

Fair value hierarchy of the financial instruments that are either measured at fair value or their fair values are disclosed for as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**			
	Level 1	**Level 2**	**Level 3**	**Total**
Financial assets/liabilities measured at fair value				
Other non-current financial assets (marketable financial assets)	39,064	-	-	39,064
Other non-current financial assets (non-marketable financial assets)	-	-	354,160	354,160
Current derivative financial assets (currency forward)	-	25,027	-	25,027
Current derivative financial assets (excluding currency forward)	-	42,988	-	42,988
Non-current derivative financial assets (currency forward)	-	62,187	-	62,187
Non-current derivative financial assets (excluding currency forward)	-	120,718	16,505	137,223
Financial assets/liabilities not measured at fair value				
Non-current borrowings (excluding lease liabilities)	-	9,704,276	-	9,704,276

(in millions of Korean won)	**December 31, 2021**			
	Level 1	**Level 2**	**Level 3**	**Total**
Financial assets/liabilities measured at fair value				
Other non-current financial assets (marketable financial assets)	21,630	-	-	21,630
Other non-current financial assets (non-marketable financial assets)	-	-	340,823	340,823
Current derivative financial assets (currency forward)	-	18,683	-	18,683
Current derivative financial assets (excluding currency forward)	-	4,606	-	4,606
Non-current derivative financial assets (currency forward)	-	54,918	-	54,918
Non-current derivative financial assets (excluding currency forward)	-	72,491	16,160	88,651
Non-current derivative financial liabilities (excluding currency forward)	-	126	-	126
Financial assets/liabilities not measured at fair value				
Non-current borrowings (excluding lease liabilities)	-	10,923,942	-	10,923,942

(4) Valuation technique and the inputs

Valuation techniques and inputs used in the fair value measurements categorized within Level 3 of the fair value hierarchy as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022				
	Fair value	**Level**	**Valuation Technique**	**Inputs**	**Coverage of Level 3 inputs**
Equity instrument					
Non-listed shares	99,193	3	Discounted cash flows model	Long-term growth rate through subsequent cash flows	1.00%
				Weighted average cost of equity	10.98% ~ 12.2%
Derivative instruments					
Option	16,505	3	Binominal option pricing model	Volatility	2.36 ~ 2.4%

(in millions of Korean won)	December 31, 2021				
	Fair value	**Level**	**Valuation Technique**	**Inputs**	**Coverage of Level 3 inputs**
Equity instrument					
Non-listed shares	97,121	3	Discounted cash flows model	Long-term growth rate through subsequent cash flows	1.00%
				Weighted average cost of equity	10.98% ~ 12.2%
Derivative instruments					
Option	16,160	3	Binominal option pricing model	Volatility	2.36 ~ 2.4%

4. Critical Accounting Estimates and Assumptions

The preparation of financial statements requires the Group to make estimates and assumptions concerning the future. Management also needs to exercise judgement in applying the Group’s accounting policies. Estimates and assumptions are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. The resulting accounting estimates may differ from the related actual results.

Significant accounting estimates and assumptions applied in the preparation of these condensed consolidated interim financial statements are the same as those applied to the consolidated financial statements for the year ended December 31, 2021, except for the estimates used to determine income tax expense.

The spread of COVID-19 has a significant impact on the domestic and international economies. This may affect the Group's financial position and business performance. and the impact is expected to be continued to the consolidated annual financial statements in 2022.

Significant accounting estimates and assumptions used in the preparation of consolidated interim financial statements may be adjusted according to fluctuations in uncertainty arising from COVID-19, and the ultimate impact of COVID-19 on the Group's business, financial position, and performance is currently unpredictable.

5. Financial Instruments by Category

Categorizations of financial instruments as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)

	March 31, 2022				
Financial assets	**Financial assets at amortized cost**	**Financial assets at fair value through profit or loss**	**Financial assets at fair value through other comprehensive income**	**Other financial assets[1]**	**Total**
Cash and cash equivalents	9,052,010	-	-	-	9,052,010
Trade receivables	6,690,200	-	328,329	-	7,018,529
Non-current trade receivables	75,103	-	-	-	75,103
Other receivables	6,312,902	-	350	-	6,313,252
Other non-current receivables	597,834	-	-	-	597,834
Other current financial assets	-	-	-	68,015	68,015
Other non-current financial assets	-	164,399	228,826	199,409	592,634
Total	22,728,049	164,399	557,505	267,424	23,717,377

(in thousands of Korean won)

	March 31, 2022		
Financial liabilities	**Financial liabilities at amortized cost**	**Other financial liabilities[2]**	**Total**
Trade payables	4,690,565	-	4,690,565
Other payables	3,203,031	-	3,203,031
Borrowings (current)	4,295,302	74,857	4,370,159
Other current liabilities (dividend payable)	935,275	-	935,275
Other non-current payables	16,103	-	16,103
Borrowings (non-current)	10,073,057	250,936	10,323,993
Total	23,213,333	325,793	23,539,126

(in millions of Korean won)	December 31, 2021				
Financial assets	**Financial assets at amortized cost**	**Financial assets at fair value through profit or loss**	**Financial assets at fair value through other comprehensive income**	**Other financial assets[1]**	**Total**
Cash and cash equivalents	3,760,834	-	-	-	3,760,834
Trade receivables	5,898,369	-	488,610	-	6,386,979
Non-current trade receivables	67,055	-	-	-	67,055
Other receivables	1,047,224	-	1,325	-	1,048,549
Other non-current receivables	713,166	-	-	-	713,166
Other current financial assets	-	-	-	23,289	23,289
Other non-current financial assets	-	160,145	202,308	143,569	506,022
Total	11,486,648	160,145	692,243	166,858	12,505,894

(in thousands of Korean won)	December 31, 2021		
Financial liabilities	**Financial liabilities at amortized cost**	**Other financial liabilities[2]**	**Total**
Trade payables	3,742,132	-	3,742,132
Other payables	3,991,784	-	3,991,784
Borrowings (current)	3,405,215	71,865	3,477,080
Other non-current financial liabilities	-	126	126
Other non-current payables	15,623	-	15,623
Borrowings (non-current)	11,041,274	247,380	11,288,654
Total	22,196,028	319,371	22,515,399

[1] Other financial assets include derivative assets that are not subject to the categorizations.
[2] Other financial liabilities include lease liabilities and derivative liabilities that are not subject to the categorizations.

Net gains or losses on each category of financial instruments for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Dividend income		
Financial assets at fair value through other comprehensive income	-	378
Interest income		
Financial assets at amortized cost	58,226	10,852
Interest expense		
Financial liabilities at amortized cost	(64,101)	(55,562)
Other financial liabilities	(2,228)	(2,093)
Financial assets at amortized cost[1]	(379)	-
Financial assets at fair value through other comprehensive income[1]	-	(62)
Gain (loss) on valuation		
Financial assets at fair value through profit or loss	81	10,973
Financial assets at fair value through other comprehensive income	(312)	2,297
Derivative instruments	101,885	10,394

Exchange differences		
Financial assets at amortized cost	141,460	244,461
Financial liabilities at amortized cost	(183,998)	(239,164)
Other financial liabilities	(4,226)	-

[1] Fees paid to financial institutions for factoring.

6. Cash and Cash Equivalents

Details of cash and cash equivalents as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Bank deposits and cash on hand	1,551,145	1,943,818
Deposits held by financial institutions and others	7,500,865	1,817,016
Total	9,052,010	3,760,834

As at March 31, 2022, cash and cash equivalents include ₩23,407 million which is subject to a restriction on the use in association with the national R&D projects.

7. Trade and Other Receivables

Trade and other receivables and its provisions for impairment, as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**		
	Gross amount	**Provision for impairment**	**Carrying amount**
Trade receivables	7,023,562	(5,033)	7,018,529
Non-current trade receivables	75,103	-	75,103
Other current receivables	6,315,417	(2,165)	6,313,252
Other non-current receivables	597,834	-	597,834
Total	14,011,916	(7,198)	14,004,718

(in millions of Korean won)	**December 31, 2021**		
	Gross amount	**Provision for impairment**	**Carrying amount**
Trade receivables	6,392,073	(5,094)	6,386,979
Non-current trade receivables	67,055	-	67,055
Other current receivables	1,050,714	(2,165)	1,048,549
Other non-current receivables	713,166	-	713,166
Total	8,223,008	(7,259)	8,215,749

Details of other receivables as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Current		
Non-trade receivables	909,351	865,984
Deposits held by financial institutions	5,085,518	64,583
Accrued income	69,053	31,955
Loans	209,600	65,266
Guarantee deposits provided	39,730	20,761
	6,313,252	1,048,549
Non-current		
Non-trade receivables	29,876	29,195
Deposits held by financial institutions[1]	277,214	267,116
Loans	197,135	330,643
Guarantee deposits provided	93,609	86,212
	597,834	713,166
Total	6,911,086	1,761,715

[1] As at March 31, 2022, ₩266,100 million (December 31, 2021: ₩266,100 million) is withdrawal restricted in relation to large, small and medium-sized companies cooperation agreement and others. In addition, ₩121 million is withdrawal restricted in connection with maintaining checking accounts (December 31, 2021: ₩120 million). Also, PLN 3 million is withdrawal restricted in relation to overseas transportation of hazardous waste.

The aging analysis of trade and other receivables as at March 31, 2022 and December 31, 2021, is as follows:

(in millions of Korean won)	**March 31, 2022**		**December 31, 2021**	
	Trade receivables	**Other receivables**	**Trade receivables**	**Other receivables**
Receivables not past due	6,903,108	6,806,484	6,118,779	1,690,123
Past due but not impaired				
Up to 3 months	170,447	97,401	236,860	70,136
Between 3-6 months	2,775	6,110	15,811	457
Over 6 months	19,647	1,091	86,022	999
	192,869	104,602	338,693	71,592
Impaired receivables	2,688	2,165	1,656	2,165
Total	7,098,665	6,913,251	6,459,128	1,763,880

Movements on the provision for impairment of trade and other receivables for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	5,094	-	2,165	-
Reversal	(489)	-	-	-
Write-off	-	-	-	-
Exchange differences	428	-	-	-
Ending balance	5,033	-	2,165	-

(in millions of Korean won)	December 31, 2021			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	4,391	-	2,165	-
Reversal	(127)	-	-	-
Write-off	(447)	-	-	-
Exchange differences	1,277	-	-	-
Ending balance	5,094	-	2,165	-

As at March 31, 2022 and December 31, 2021, the carrying amounts of trade and other receivables are approximation of their fair values.

The Group transferred trade and other receivables to financial institutions for ₩51,678 million at March 31, 2022 (December 31, 2021: ₩3,469 million), and derecognized the trade and other receivables from the financial statements at the date of disposal, as substantial all the risks and rewards were transferred.

8. Other Financial Assets and Liabilities

Details of other financial assets and liabilities as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022	December 31, 2021
Other financial assets		
Financial assets at fair value through other comprehensive income (derivative instruments) (current)	42,988	4,606
Financial assets at fair value through profit or loss (derivative instruments) (current)	25,027	18,683
Financial assets at fair value through other comprehensive income (derivative instruments) (non-current)	21,664	1,305
Financial assets at fair value through other comprehensive income (excluding derivative instruments) (non-current)	228,826	202,308

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Financial assets at fair value through profit or loss (derivative instruments) (non-current)	177,745	142,264
Financial assets at fair value through profit or loss (excluding derivative instruments) (non-current)	164,399	160,145
	660,649	529,311
Other financial liabilities		
Financial liabilities at fair value through other comprehensive income (derivative instruments) (non-current)	-	126
	-	126

Changes in equity and debt instruments included in other financial assets for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Beginning balance	362,452	81,532
Acquisitions / transfer	29,482	248,354
Disposals	-	(16,388)
Gain (loss) on valuation through other comprehensive income (before income tax effects)	(312)	15,990
Gain on valuation through profit or loss	81	29,810
Others	1,521	3,154
Ending balance	393,224	362,452

During the three-month period ended March 31, 2022 and for the year ended December 31, 2021, the Group did not recognize impairment for other financial assets.

9. Inventories

Details of inventories as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**		
	Gross amount	**Valuation allowance**	**Carrying amount**
Merchandise	193,642	(13,325)	180,317
Finished / Semi-finished products	5,059,647	(235,539)	4,824,108
Work-in-process	27,826	-	27,826
Raw materials	2,333,608	(24,207)	2,309,401
Supplies	282,185	-	282,185
Goods-in-transit	1,688,059	-	1,688,059
Total	9,584,967	(273,071)	9,311,896

(in millions of Korean won)	December 31, 2021		
	Gross amount	Valuation allowance	Carrying amount
Merchandise	192,580	(6,131)	186,449
Finished / Semi-finished products	4,715,464	(233,613)	4,481,851
Work-in-process	25,587	-	25,587
Raw materials	2,040,432	(24,104)	2,016,328
Supplies	266,487	-	266,487
Goods-in-transit	1,306,772	-	1,306,772
Total	8,547,322	(263,848)	8,283,474

During the three-month period ended March 31, 2022, the cost of inventories recognized as expense and included in 'cost of sales' amounted to ₩7,121,079 million (2021: ₩4,698,498 million).

10. Investments in Associates and Joint Ventures

Changes in investments in associates and joint ventures for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022							
	Beginning balance	Acquisitions / transfer	Dividends	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income (loss) of associates and joint ventures	Impairment / disposals	Others	Ending balance
VINA Plasticizers Chemical Co.,Ltd.	12,822	-	-	1,700	804	-	-	15,326
TECHWIN Co., Ltd.	19,024	-	-	(582)	(69)	-	-	18,373
SEETEC Co., Ltd	134,843	-	(5,000)	1,063	-	-	(307)	130,599
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	-	579
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	-	150
LG Life Sciences Poland Ltd.	17	-	-	-	-	-	-	17
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	93,835	-	-	(1,363)	2,453	-	-	94,925
VINFAST LITHIUM BATTERY PACK LIMITED LIABILITY COMPANY	3,769	-	-	(163)	278	-	-	3,884
Jiangxi VL Battery Co.,Ltd	20,310	-	-	(1,586)	407	-	-	19,131
PT.HLI Green Power	201,488	-	-	(6,368)	4,272	-	-	199,392
TL Chemical CO., Ltd	48,473	-	-	71	-	-	-	48,544
	535,310	-	(5,000)	(7,228)	8,145	-	(307)	530,920

(in millions of Korean won)

	December 31, 2021							
	Beginning balance	Acquisitions / transfer	Dividends	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income (loss) of associates and joint ventures	Impairment / disposals	Others	Ending balance
VINA Plasticizers Chemical Co., Ltd.	5,875	-	(334)	7,204	77	-	-	12,822
HL Greenpower Co., Ltd.	22,710	-	-	1,847	-	(24,323)	(234)	-
TECHWIN Co., Ltd.	20,113	-	-	(1,106)	17	-	-	19,024
SEETEC Co., Ltd	140,116	-	(10,000)	4,727	-	-	-	134,843
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	-	579
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	-	150
FJ Composite Materials Co., LTD.	2,737	-	-	(544)	652	(2,576)	(269)	-
WUXI CL New Energy Technology Ltd	-	-	-	-	-	-	-	-
LG Life Sciences Poland Ltd.	17	-	-	-	-	-	-	17
Combustion Synthesis Co., Ltd.	1,867	-	-	273	(106)	(1,969)	(65)	-
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	89,525	-	-	(5,537)	9,847	-	-	93,835
VINFAST LITHIUM BATTERY PACK LIMITED LIABILITY COMPANY	4,179	-	-	(730)	320	-	-	3,769
Jiangxi VL Battery Co.,Ltd	21,461	-	-	(3,471)	2,320	-	-	20,310
PT.HLI Green Power	-	209,132	-	(9,201)	1,557	-	-	201,488
TL Chemical CO., Ltd	-	48,544	-	(71)	-	-	-	48,473
	309,329	257,676	(10,334)	(6,609)	14,684	(28,868)	(568)	535,310

11. Property, Plant and Equipment

Changes in property, plant and equipment for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Beginning balance	24,378,259	20,567,475
Business combination (Note 37)	7,251	250,128
Acquisitions / transfer	2,430,324	12,512,008
Disposals / transfer	(959,138)	(6,864,140)
Exchange differences	103,943	560,958
Depreciation	(727,295)	(2,617,458)
Impairment	(918)	(30,712)
Ending balance	25,232,426	24,378,259

During the three-moth ended March 31, 2022, the Group capitalized ₩4,520 million of borrowing costs (2021: ₩17,360 million) in relation to acquisition of property, plant and equipment, on property, plant and equipment. The capitalization rate of borrowings used to determine the amount of borrowing costs eligible for capitalization is 1.35% (2021: 1.53%).

Line items including depreciation in the consolidated statements of profit or loss for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Cost of sales	656,774	520,725
Selling and administrative expenses	70,288	54,466
Others	121	325
Discontinued operations	112	2,005
Total	727,295	577,521

Lease

(i) Amounts recognized in the consolidated statement of financial position

Details of right-of-use assets in consolidated statement of financial position are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Right-of-use assets[1]		
Real-estate	329,376	329,920
Machinery	22,580	23,258
Vehicles	27,197	21,475
Tools	2,638	2,083
Equipment	659	473
	382,450	377,209

[1] Included in the line item 'Property, plant and equipment' in the consolidated statements of financial position.

Additions to the right-of-use assets during the three-month ended March 31, 2022, were ₩31,398 million (2021: ₩132,653 million).

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Lease liabilities[1]		
Current	74,857	71,865
Non-current	250,936	247,380
	325,793	319,245

[1] Included in the line item 'Borrowings' in the consolidated statements of financial position.

(ii) Amounts recognized in the consolidated statement of profit or loss

Lease related expenses recognized in the consolidated statement of profit or loss for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Depreciation of right-of-use assets		
Real-estate	16,542	13,475
Machinery	1,431	1,403
Vehicles	4,039	3,202
Tools	475	366
Equipment	65	123
	22,552	18,569
Interest expense relating to lease liabilities (included in finance cost)	2,228	2,093
Expense relating to short-term leases (included in cost of goods sold and administrative expenses)	6,831	6,879
Expense relating to leases of low-value assets that are not short-term leases (included in cost of goods sold and administrative expenses)	3,598	3,213

Total cash outflow for leases during the three-month period ended March 31, 2022, was ₩33,480 million (2021: ₩29,500 million).

12. Intangible Assets

Changes in intangible assets for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Beginning balance	2,444,303	2,279,917
Business combination (Note 37)	1,503	251,856
Separate acquisitions/ transfer	149,538	427,080
Additions – internal development	-	220
Disposals/ transfer	(35,449)	(15,425)
Exchange differences	(2,535)	23,042
Amortization	(65,755)	(223,178)
Impairment	(40)	(298,849)
Transfer to assets held for sale (Note 34)	-	(360)
Ending balance	2,491,565	2,444,303

Line items including amortization of intangible assets for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Cost of sales	15,189	11,978
Selling and administrative expenses	50,566	38,032
Discontinued operations	-	157
Total	65,755	50,167

Total research and development costs recognized as expenses amounted to ₩357,237 million (2021: ₩280,032 million) for the three-month periods ended March 31, 2022 and 2021.

Details of greenhouse gas emission permits included in other intangible assets are as follows:

Greenhouse gas emission permits held for the purpose of fulfilling obligations

The number of greenhouse gas emission permits received at free of charge for the 3rd planning period (2021 to 2025) is as follows:

(in thousands of tons)	**2021**	**2022**	**2023**	**2024**	**2025**	**Total**
Allocation with nil consideration	9,407	9,432	9,432	9,344	9,344	46,959

Changes in greenhouse gas emission permits during the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in thousands of tons and millions of Korean won)	March 31, 2022							
	2020		2021		2022		2023	
	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance /Allocation with nil consideration	8,666	-	9,407	-	9,432	-	9,432	-
Purchase/Sale	(69)	1,111	(90)	-	-	-	-	-
Exchange	100	-	(100)	-	-	-	-	-
Borrowings/Carry forwards between years	(49)	(388)	49	388	-	-	-	-
Surrendered to the government	(8,648)	(723)	-	-	-	-	-	-
Ending balance[1]	-	-	9,266	388	9,432	-	9,432	-

(in thousands of tons and millions of Korean won)	March 31, 2022					
	2024		2025		Total	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance / Allocation with nil consideration	9,344	-	9,344	-	55,625	-
Purchase/Sale	-	-	-	-	(159)	1,111
Exchange	-	-	-	-	-	-
Borrowings/Carry forwards between years	-	-	-	-	-	-
Surrendered to the government	-	-	-	-	(8,648)	(723)
Ending balance[1]	9,344	-	9,344	-	46,818	388

[1] The emission permits for 2021 is expected to be surrendered to the government after getting a certification in the current year.

(in thousands of tons and millions of Korean won)	December 31, 2021							
	2020		2021		2022		2023	
	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance /Allocation with nil consideration	8,666	-	9,405	-	9,430	-	9,430	-
Purchase/Sale	(69)	1,111	(54)	-	-	-	-	-
Exchange	100	-	(100)	-	-	-	-	-
Borrowings/Carry forwards between years	(49)	(388)	49	388	-	-	-	-
Surrendered to the government	(8,648)	(723)	-	-	-	-	-	-
Ending balance	-	-	9,300	388	9,430	-	9,430	-

(in thousands of tons and millions of Korean won)	December 31, 2021					
	2024		2025		Total	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance / Allocation with nil consideration	9,343	-	9,343	-	55,617	-
Purchase/Sale	-	-	-	-	(123)	1,111
Exchange	-	-	-	-	-	-
Borrowings/Carry forwards between years	-	-	-	-	-	-
Surrendered to the government	-	-	-	-	(8,648)	(723)
Ending balance	9,343	-	9,343	-	46,846	388

During the three-month period ended March 31, 2022 and for the year ended December 31, 2021, there are no greenhouse gas emission permits held for short-term trading purpose.

13. Other Current and Non-Current Assets

Details of other current and non-current assets as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022	December 31, 2021
Current		
Prepayments to suppliers and prepaid expenses	243,096	201,019
Prepaid value added tax	468,754	465,660
Others	117,473	82,353
Total	829,323	749,032
Non-current		
Net defined benefit assets	12,773	45,050
Long-term prepayments and long-term prepaid expenses	74,085	70,775
Others	138	96
Total	86,996	115,921

14. Borrowings

Borrowings as at March 31, 2022 and December 31, 2021, consist of:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Current		
Short-term borrowings	1,706,842	1,688,383
Current portion of long-term borrowings	1,479,050	1,056,963
Current portion of debentures	1,109,410	659,869
Current lease liabilities	74,857	71,865
	4,370,159	3,477,080
Non-current		
Long-term borrowings	3,313,323	3,628,563
Debentures	6,759,734	7,412,711
Lease liabilities	250,936	247,380
	10,323,993	11,288,654
Total	14,694,152	14,765,734

Details of short-term borrowings as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**Bank**	**Latest maturity date**	**Interest rate(%) as at March 31, 2022**	**March 31, 2022**	**December 31, 2021**
Bank loans	Citi and others	March 10, 2023	3.00 and others	1,674,293	1,237,430
Negotiated borrowings in foreign curreny[1]	Woori Bank and others	April 30, 2022	EURIBOR + 0.62 and others	32,549	450,953
Total				1,706,842	1,688,383

[1] The above borrowings in foreign currency are accounted for as collateralized borrowings for trade receivables.

Details of long-term borrowings as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022				
	Bank	**Annual interest rate (%)**	**Amount in Korean won**	**Current**	**Non-current**
Borrowings in Korean won	KDB	3.05	300,000	-	300,000
	BOA	1.95	150,000	-	150,000
Borrowings in foreign currencies	HSBC	USD: 3M LIBOR + 1.40	4,225	4,225	-
	SMBC	USD : 1.30 EUR : 0.32~0.48 Euribor(3M) + 0.8	458,276	148,963	309,313
	Construction Bank of China	PBOC ×0.90	8,473	8,473	-
	Agriculture Bank of China	LPR(1Y)+0.7	74,126	4,560	69,566
	CITI	EUR: 3M EURIBOR + 0.62~0.70 PLN: 3M Wibor+0.85	248,246	-	248,246
	ING	6M EURIBOR + 0.70 ~0.83	162,504	67,710	94,794
	RHB	3M KLIBOR + 70bp	21,292	-	21,292
	Bank of China	CD(91D) + 100bp	50,000	-	50,000
	EBRD	6M EURIBOR+0.62	325,009	67,710	257,299
	MUFG	6M EURIBOR + 0.60~0.80	67,710	-	67,710
	Industrial and Commercial Bank of China	PBOC ×1.00	36,891	15,473	21,418
	Hana Bank	3M EURIBOR + 0.62	270,841	-	270,841
	KDB	USD: 3M LIBOR+ 0.77~0.95 EUR: 3M EURIBOR + 1.00~1.50	1,006,235	507,405	498,830
	The Export-Import Bank of Korea	3M EURIBOR + 1.00~1.50	548,739	297,925	250,814
	NongHyup Bank	3M EURIBOR + 1.00~1.50	274,369	148,962	125,407
	EIB	3M EURIBOR + 0.47	650,017	72,224	577,793
	DBS	6M EURIBOR + 0.60	135,420	135,420	-
Total			4,792,373	1,479,050	3,313,323

(in millions of Korean won)	December 31, 2021				
	Bank	**Annual interest rate (%)**	**Amount in Korean won**	**Current**	**Non-current**
Borrowings in Korean won	KDB	3.05	300,000	-	300,000
	BOA	1.95	150,000	-	150,000
Borrowings in foreign currencies	HSBC	USD: 3M LIBOR + 1.40 CNY: PBOC × 0.95, LPR(5Y) - 0.3375	8,313	8,313	-
	SMBC	USD : 1.30 EUR : 3M EURIBOR + 0.8, 0.32~0.48	451,478	10,076	441,402
	Construction Bank of China	PBOC ×0.90	8,305	8,305	-
	Agriculture Bank of China	LPR(1Y)+0.7	74,504	4,470	70,034
	CITI	EUR: 3M EURIBOR + 0.62~0.70 PLN: 3M Wibor+0.85	246,807	-	246,807
	ING	6M EURIBOR + 0.70 ~0.83	161,224	67,177	94,047
	EBRD	6M EURIBOR+0.62	322,448	67,177	255,271
	MUFG	6M EURIBOR + 0.60~0.80	134,354	67,177	67,177
	Industrial and Commercial Bank of China	PBOC ×1.00	39,666	14,785	24,881
	KEB Hana Bank	3M EURIBOR + 0.62	268,706	-	268,706
	KDB	USD: 3M LIBOR+ 0.77~0.95 EUR: 3M EURIBOR + 0.75~1.50	964,255	366,118	598,137
	The Export-Import Bank of Korea	3M EURIBOR + 0.75~1.50	517,479	295,577	221,902
	NongHyup Bank	3M EURIBOR + 0.75~1.50	258,739	147,788	110,951
	EIB	3M EURIBOR + 0.47	644,895	-	644,895
	DBS	6M EURIBOR + 0.60	134,353	-	134,353
Total			4,685,526	1,056,963	3,628,563

Details of debentures as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022					
	Financial institution	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
50-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.28	2022.5.19	400,000	400,000	-
50-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.53	2024.5.19	280,000	-	280,000
51-2nd Debenture (non-guaranteed/public)[2]	NH Investment & Securities Co., Ltd. and others	2.88	2023.2.20	240,000	240,000	-
51-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.07	2025.2.20	270,000	-	270,000
51-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.29	2028.2.20	300,000	-	300,000
52-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.11	2024.3.13	240,000	-	240,000
52-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.40	2029.3.13	400,000	-	400,000
53-1st Debenture (non-guaranteed/public)[2]	NH Investment & Securities Co., Ltd. and others	1.57	2023.2.19	350,000	350,000	-
53-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.65	2025.2.19	250,000	-	250,000
53-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.72	2027.2.19	50,000	-	50,000
53-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.91	2030.2.19	250,000	-	250,000
54-1st Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	1.14	2024.2.19	350,000	-	350,000
54-2nd Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	1.51	2026.2.19	270,000	-	270,000
54-3rd Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	1.76	2028.2.19	200,000	-	200,000
54-4th Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	2.14	2031.2.19	260,000	-	260,000
54-5th Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	2.22	2036.2.19	120,000	-	120,000
55-1st Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	2.39	2031.5.7	90,000	-	90,000
55-2nd Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	2.52	2036.5.7	60,000	-	60,000
5Y USD Green Bond (non-guaranteed/private)	Citi Securities and others	1.38	2026.7.7	605,400	-	605,400
10Y USD Green Bond (non-guaranteed/private)	Citi Securities and others	2.38	2031.7.7	605,400	-	605,400
1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.21	2026.03.13	200,000	-	200,000
USD foreign currency debenture with maturity in 2024	Citi and others	3.25	2024.10.15	605,400	-	605,400
USD foreign currency debenture with maturity in 2029	Citi and others	3.63	2029.4.15	605,400	-	605,400
EUR foreign currency debenture with maturity in 2023	Citi and others	0.50	2023.4.15	675,564	-	675,564
Debentures in Korean won (non-guaranteed)	NH Investment & Securities Co., Ltd.[2]	3.00	2023.3.2	40,000	40,000	-
	NH Investment & Securities Co., Ltd.[2]	1.95	2023.2.14	80,000	80,000	-

(in millions of Korean won)

	March 31, 2022				
	Financial institution	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
	NH Investment & Securities Co., Ltd.	2.22	2025.2.14	30,000	-	30,000
	NH Investment & Securities Co., Ltd.	1.56	2024.2.08	70,000	-	70,000
Less: discount on debentures				(28,020)	(590)	(27,430)
Total				7,869,144	1,109,410	6,759,734

(in millions of Korean won)

	December 31, 2021					
	Financial institution	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
50-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.28	2022.5.19	400,000	400,000	-
50-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.53	2024.5.19	280,000	-	280,000
51-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.88	2023.2.20	240,000	-	240,000
51-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.07	2025.2.20	270,000	-	270,000
51-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.29	2028.2.20	300,000	-	300,000
52-1st Debenture (non-guaranteed/public)[1]	NH Investment & Securities Co., Ltd. and others	2.02	2022.3.13	160,000	160,000	-
52-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.11	2024.3.13	240,000	-	240,000
1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.21	2026.03.13	200,000	-	200,000
52-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.40	2029.3.13	400,000	-	400,000
53-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.57	2023.2.19	350,000	-	350,000
53-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.65	2025.2.19	250,000	-	250,000
53-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.72	2027.2.19	50,000	-	50,000
53-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.91	2030.2.19	250,000	-	250,000
54-1st Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	1.14	2024.2.19	350,000	-	350,000
54-2nd Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	1.51	2026.2.19	270,000	-	270,000
54-3rd Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	1.76	2028.2.19	200,000	-	200,000
54-4th Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	2.14	2031.2.19	260,000	-	260,000
54-5th Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	2.22	2036.2.19	120,000	-	120,000
USD foreign currency debenture with maturity in 2024	Citi and others	3.25	2024.10.15	592,750	-	592,750
USD foreign currency debenture with maturity in 2029	Citi and others	3.63	2029.4.15	592,750	-	592,750
EUR foreign currency	Citi and others	0.50	2023.4.15	671,170	-	671,170

(in millions of Korean won)	December 31, 2021					
	Financial institution	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
debenture with maturity in 2023						
5Y USD Green Bond (non-guaranteed/private)	Citi Securities and others	1.38	2026.7.7	592,750	-	592,750
10Y USD Green Bond (non-guaranteed/private)	Citi Securities and others	2.38	2031.7.7	592,750	-	592,750
1-2nd EUR Overseas Exchangeable bonds	Credit Suisse	-	2021.1.14	-	-	-
Debentures in Korean won (non-guaranteed)	NH Investment & Securities Co., Ltd.[1]	2.26	2022.2.16	100,000	100,000	-
	NH Investment & Securities Co., Ltd.	3.00	2023.3.2	40,000	-	40,000
	NH Investment & Securities Co., Ltd.	1.95	2023.2.14	80,000	-	80,000
	NH Investment & Securities Co., Ltd.	2.22	2025.2.14	30,000	-	30,000
	NH Investment & Securities Co., Ltd.	1.56	2024.2.8	70,000	-	70,000
55-1st Debenture (non-guaranteed/private)	KB Securities Co., Ltd and others	2.39	2031.5.7	90,000	-	90,000
55-2nd Debenture (non-guaranteed/private)	KB Securities Co., Ltd and others	2.52	2036.5.7	60,000	-	60,000
Less: discount on debentures				(29,590)	(131)	(29,459)
Total				8,072,580	659,869	7,412,711

[1] Redeemed during the three-month period ended March 31, 2022.
[2] Reclassified to current portion during the three-month period ended March 31, 2022.

Details of lease liabilities as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022				
Leaser	**Annual interest rate (%)**	**Latest maturity date**	**Total amount**	**Current**	**Non-current**
Hyundai Oil Bank and others	1.98 ~ 3.01	2082.2.28	325,793	74,857	250,936

(in millions of Korean won)	December 31, 2021				
Leaser	**Annual interest rate (%)**	**Latest maturity date**	**Total amount**	**Current**	**Non-current**
Hyundai Oil Bank and others	1.98 ~ 3.01	2068.3.31	319,245	71,865	247,380

15. Provisions

Changes in provisions for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022					
	Warranty[1]	Greenhouse gas emission[2]	Legal claims[3]	Restoration[4]	Repair warranty[5]	Total
Beginning balance	2,110,180	79	15,642	83,807	-	2,209,708
Business Combination (Note 37)	-	-	-	-	4,999	4,999
Additions (reversal)	64,766	5,813	50	1,069	(220)	71,478
Used	(287,601)	-	(1,037)	(7,917)	-	(296,555)
Ending balance	1,887,345	5,892	14,655	76,959	4,779	1,989,630
Less: current portion	(1,382,717)	(5,892)	-	(41,702)	(93)	(1,430,404)
Total	504,628	-	14,655	35,257	4,686	559,226

(in millions of Korean won)	December 31, 2021				
	Warranty[1]	Greenhouse gas emission[2]	Legal claims[3]	Restoration[4]	Total
Beginning balance	1,244,017	4,875	8,286	112,829	1,370,007
Business Combination (Note 37)	2,406	-	-	-	2,406
Additions (reversal)	1,477,429	(4,072)	14,013	14,186	1,501,556
Used	(613,672)	(724)	(6,657)	(43,208)	(664,261)
Ending balance	2,110,180	79	15,642	83,807	2,209,708
Less: current portion	(1,532,356)	(79)	-	(40,320)	(1,572,755)
Total	577,824	-	15,642	43,487	636,953

[1] Warranty provisions have been accrued based on historical experience for the estimated warranty costs to be incurred due to quality control, exchange, refunds with regard to products. In addition, provisions related to replacement costs for ESS and voluntary automotive battery recalls are determined based on the best estimate and included in the above warranty provision. The provisions are adjusted to reflect the current best estimate.

[2] Greenhouse gas emission provisions have been accrued for estimated expenditures to be obligated for any excess emission. The estimated emission as at March 31, 2022 amounts to 2,459 thousand tons (March 31, 2021: 2,150 thousand tons).

[3] Lawsuit provisions have been accrued for certain pending cases.

[4] As at March 31, 2022, restoration provisions have been accrued for the estimated expenses to restore land pollutions and others.

[5] Repair warranty provisions have been accrued based on historical experience for the estimated warranty costs to be incurred with regard to repairs.

16. Net Defined Benefit Liabilities

Details of net defined benefit liabilities(assets) recognized in the consolidated statements of financial position as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Present value of defined benefit obligations[1]	1,644,168	1,616,781
Fair value of plan assets	(1,617,058)	(1,643,709)
Liabilities (assets) in the consolidated statement of financial position[2]	27,110	(26,928)

[1] The present value of retirement benefit obligations is net of existing contributions to the National Pension Plan of ₩658 million as at March 31, 2022 (December 31, 2021: ₩708 million).

[2] Includes net defined benefit assets.

The amounts recognized in the consolidated statements of profit or loss for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Current service cost[1]	52,673	47,527
Interest cost	(168)	698
Total, included in employee benefit expenses	52,505	48,225

[1] The above amounts excluded ₩273 million (2021: ₩1,027 million) of expenses capitalized to construction in progress and development costs.

Post-employment benefits recognized for defined contribution plan for the three-month period ended March 31, 2022, amounted to ₩3,450 million (2021: ₩2,972 million).

Post-employment benefits recognized in the consolidated statements of profit or loss for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Cost of sales	32,927	30,833
Selling and administrative expenses	23,028	20,120
Discontinued operations	-	244
Total	55,955	51,197

Movements in the present value of defined benefit obligations for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Beginning balance	1,616,781	1,454,596
Increase in defined benefit obligations due to business combination	-	54,897
Transfer in	2,072	39,334
Transfer out	(1,682)	(8,314)
Current service cost	52,946	193,938
Interest expense	11,582	37,257
Remeasurements:		
Actuarial loss from change in demographic assumptions	-	4,586
Actuarial gain from change in financial assumptions	-	(76,261)
Actuarial loss (gain) from experience adjustments	-	9,142
Others	-	11,336
Exchange differences	477	(4,600)
Payments from plans	(38,008)	(99,130)
Ending balance	1,644,168	1,616,781

Movements in the fair value of plan assets for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Beginning balance	1,643,709	1,336,637
Increase in plan assets due to business combination	-	45,275
Transfer in	-	1,135
Transfer out	(402)	(1,238)
Interest income	11,750	35,198
Remeasurements:		
Return on plan assets (excluding amounts included in interest income)	(2,885)	(13,326)
Contributions:		
Employers	272	332,299
Payments from plans	(34,178)	(89,445)
Administrative costs	(1,208)	(2,826)
Ending balance	1,617,058	1,643,709

The actual return on plan assets for the three-month period ended March 31, 2022, was ₩8,865 million and for the year ended December 31, 2021, was ₩21,872 million.

The significant actuarial assumptions as at March 31, 2022 and December 31, 2021, are as follows:

	March 31, 2022	**December 31, 2021**
Discount rate	2.9% ~ 3.0%	2.9% ~ 3.0%
Salary growth rate	5.0%	5.0%

The sensitivity analysis for changes in key actuarial assumptions as at March 31, 2022, is as follows:

(in millions of Korean won)	**Increase by 0.5%**	**Decrease by 0.5%**
Discount rate:		
Increase (decrease) in defined benefit obligations	(127,403)	147,850
Salary growth rate:		
Increase (decrease) in defined benefit obligations	143,601	(125,976)

A decrease in corporate bond yields may lead most significantly to an increase in defined benefit liabilities.

The above sensitivity analyses are based on a change in an assumption while holding all other assumptions constant. In practice, this is unlikely to occur, and changes in some of the assumptions may be correlated. The sensitivity of the defined benefit obligation to changes in principal actuarial assumptions is calculated using the projected unit credit method, the same method applied when calculating the defined benefit obligations recognized on the statement of financial position.

The methods and types of assumptions used in preparing the sensitivity analysis did not change compared to the prior period.

Plan assets as at March 31, 2022 and December 31, 2021, consist of:

(in millions of Korean won)	**March 31, 2022**		**December 31, 2021**	
	Amount	**Composition (%)**	**Amount**	**Composition (%)**
Insurance contracts with guaranteed yield	1,603,321	99.1	1,629,239	99.1
Equity linked bonds	12,370	0.8	12,988	0.8
Time deposits	1,367	0.1	1,482	0.1
	1,617,058	100.0	1,643,709	100.0

Plan assets consist of various debt instruments with principal and interest protection and others which have no quoted market prices in an active market.

17. Other Current and Non-Current Liabilities

Details of other current and non-current liabilities as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Current		
Advances from customers	447,674	373,356
Dividends payable	935,275	-
Withholdings	126,356	143,600
Unearned revenues	165,810	104,121
Accrued expenses	268,523	699,592
Total	1,943,638	1,320,669
Non-current		
Long-term accrued expenses	74,598	73,880
Long-term unearned revenues	87,153	99,169
Long-term advanced received	13,361	16,829
Total	175,112	189,878

18. Commitments and Contingencies

(1) The Parent Company is jointly liable for liabilities of LG Energy Solutions Co., Ltd. as at December 1, 2020, a newly established company through the split-off from the Parent Company.

(2) As at March 31, 2022, the Parent Company and certain subsidiaries have been guaranteed from Seoul Guarantee Insurance Company for the execution of contracts and others.

(3) As at March 31, 2022, the Parent Company and certain subsidiaries have various specific line of credit agreements with several financial institutions, as follows:

(*unit: Korean won in millions, foreign currencies in millions*)

Classification	**The Parent Company**		**Certain Overseas Subsidiaries**							
	KRW	**USD**	**KRW**	**USD**	**CNY**	**EUR**	**PLN**	**INR**	**THB**	**MYR**
Limit of bank overdraft	20,400	-	8,700	140	1,000	97	-	-	10	-
Limit of the letter of credit	20,000	278	-	297	2,309	-	-	763	-	-
Limit of discount of notes from export	-	329	-	481	2,900	-	-	-	-	-
Limit of guaranteed payments in other foreign currency	-	405	-	122	400	-	-	-	-	-
Limit of loan arrangements	800,000	760	110,000	3,543	4,404	2,815	155	4,521	-	450
Derivatives	-	-	-	1,204	-	-	-	-	-	-
Limit of other loans	-	-	-	70	-	-	-	-	-	-

The Group also entered into comprehensive credit line agreements with other financial institutions relating to trade finance and import/export amounting to ₩20,000 million (including bank overdraft of ₩5,000 million) and USD 300 million. Certain subsidiaries entered into factoring agreements with limit of ₩230,000 million and USD 175 million.

(4) As at March 31, 2022, the Parent Company and certain subsidiaries have B2B purchase arrangements with several financial institutions with limit of ₩235,000 million and ₩150,000 million, respectively.

(5) As at March 31, 2022, the Parent Company has reverse factoring agreements, and there is no utilized amount.

(6) As at March 31, 2022, in connection with styrene monomer gas leakage accident, several lawsuits against LG Polymer India Pvt. Ltd., a subsidiary, have been filed with National Green Tribunal of India (NGT) and Andhra Pradesh High Court (APHC). The ultimate outcome of these cases cannot be determined at the reporting date. LG Polymer India Pvt. Ltd deposited INR 500 million under the order from NGT, and deposited INR 898 million generated from sales of inventories, under the order from APHC in connection with this accident. The manufacturing facility is currently closed with limited access in accordance with the order from APHC.

(7) As at March 31, 2022, in relation to price fixing of mobile batteries, the consumers in Israel have filed two class actions against the Parent Company and certain overseas subsidiaries. However, the ultimate outcome of these cases cannot be determined at the reporting date.

(8) As at March 31, 2022, in relation to General Motors (GM) Bolt EV, the class action against General Motors (GM) Bolt EV including the Group is still pending. However, the ultimate outcome of the case cannot be determined at the reporting date.

(9) In addition, as at March 31, 2022, the Parent Company and certain subsidiaries have been named as a plaintiff in 8 and 22 legal actions, respectively, involving ₩26,494 million and ₩11,945 million in claims, respectively. They have been named as a defendant in 14 and 151 legal actions, respectively, with ₩43,345 million and ₩3,647 million in claims, respectively. The ultimate outcome of these cases cannot be determined at the reporting date.

(10) As at March 31, 2022, the Parent Company is under investigation by the related authorities in relation to the manipulation of the emission of fine dust-causing substance in the Yeosu Industrial Complex, and the final outcome of these investigations cannot be determined at the reporting date. As at March 31, 2022, the Parent Company shut down the relevant production facilities.

(11) The Parent Company has entered into manufacture and production technical contracts with ExxonMobil and others.

(12) The Parent Company has entered into a license agreement with LG Corp. to use trademarks on the products that the Group manufactures and sells, and on the services the Group provides in relation to its business.

(13) As at March 31, 2022, the Parent Company has entered into payment guarantee contract of USD 273 million, and certain subsidiaries have entered into payment guarantee contracts of USD 25 million, EUR 2 million and ₩7,755 million with financial institutions to guarantee the warrant of products and payment. Also, certain subsidiaries have entered into payment guarantee contract of CNY 341 million with financial institutions in relation to custom of imported raw materials.

(14) Capital expenditure arrangement that has not incur at the end of the reporting period is as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Property, plant and equipment	4,039,372	3,822,461

(15) As at March 31, 2022, the Group has entered into an agreement with General Motors (GM) regarding joint investment in Ultium Cells LLC, whereby each party can sell its shares to third parties in 8 years after the inception of the contract. In addition, if one party defaults, the other party has the right to purchase shares from the other party. The Group completed the process of approval by the government for the use of core technologies according to the Industrial Technology Protection Act.

(16) As at March 31, 2022, Stellantis, the Group's customer, has recalled Chrysler PHEV vehicles over a potential fire risk. There has been no confirmed root cause of fires in the Stellantis vehicles that are subject to the recall.

19. Share Capital

Changes in share capital and share premium for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won and in shares)	**Ordinary shares**		**Preferred shares**		
	Number of shares	**Share capital**	**Number of shares**	**Share capital**	**Share premium**
January 1, 2021	70,592,343	352,962	7,688,800	38,444	2,014,036
December 31, 2021	70,592,343	352,962	7,688,800	38,444	2,014,036
March 31, 2022	70,592,343	352,962	7,688,800	38,444	2,014,036

Changes in treasury shares for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won and in shares)	**Number of shares**		**Carrying amount**	**Gain on disposal of treasury shares**
	Ordinary shares	**Preferred shares**		
January 1, 2021	464,842	16,368	35,699	431,720
Treasury shares reduction due to the exercise of exchange rights	(91,228)	-	(14,302)	28,344
Disposal of treasury shares[1]	(6,085)	(10,327)	(3,386)	3,744
December 31, 2021	367,529	6,041	18,011	463,808
March 31, 2022	367,529	6,041	18,011	463,808

[1] After the exchange of exchangeable bonds, all of the remaining treasury shares purchased in early 2017 due to the exercise of share purchase rights by the dissenting shareholders who objected to the merger with LG Life Sciences, Ltd. have been disposed of during the year ended December 31, 2021.

20. Retained Earnings

Retained earnings as at March 31, 2022 and December 31, 2021, consist of:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Legal reserve[1]	527,848	540,492
Discretionary reserve[2]	14,570,240	12,945,537
Retained earnings before appropriation	2,744,069	4,605,920
Total	17,842,157	18,091,949

[1] The Commercial Code of the Republic of Korea requires the Parent Company to appropriate for each financial period, as a legal reserve, an amount equal to a minimum of 10% of cash dividends paid until such reserve equals 50% of its issued share capital. The reserve is not available for cash dividends payment, but may be transferred to share capital or used to reduce accumulated deficit. When the accumulated legal reserves (the sum of capital reserves and earned profit reserves) are greater than 1.5 times the paid-in capital amount, the excess legal reserves may be distributed in accordance with a resolution of the shareholders' meeting.

[2] The Group separately accumulates a discretionary reserve for research and human resource development through appropriation of retained earnings, which has been included as deductible expense for the corporate income tax return according to the Special Tax Treatment Law. Among these reserves, the used amounts for each specific purpose and the balances after use can be transferred to discretionary reserve and will be able used for dividends.

21. Other Components of Equity

Details of other components of equity as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Treasury shares (Note 19)	(18,011)	(18,011)
Capital transactions within the Group[1]	(19,299)	(19,299)
Total	(37,310)	(37,310)

[1] Includes gain or loss on disposal of investments and investment differences due to changes in equity, net of deferred tax.

22. Selling and Administrative Expenses

Selling and administrative expenses for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Wages and salaries	346,365	252,288
Post-employment benefits (Note 16)	23,028	20,120
Employee benefits	64,153	54,176
Travel expense	12,419	7,278
Water & utilities	24,693	18,653
Packaging expense	1,951	1,438
Rental expenses	34,991	28,484
Commission expenses	206,243	171,703
Depreciation	70,646	54,770
Advertising expense	7,229	5,600
Freight expenses	446,514	208,606
Training expense	7,075	3,930
Amortization (Note 12)	50,566	38,032
Sample expense	5,224	3,245
Development costs	57,880	50,869
Others	114,462	129,510
Total	1,473,439	1,048,702

23. Classification of Expenses by Nature

Cost of sales, and selling and administrative expenses by nature for the three-month periods ended March 31, 2022 and 2021, consist of:

(in millions of Korean won)	**2022**	**2021**
Changes in inventories of merchandise, finished goods, semi-finished goods and work in process	(338,364)	(276,884)
Raw materials and consumables used	7,133,481	4,663,888
Purchase of merchandise	325,962	311,494
Employee benefit expenses (Note 24)	994,105	726,990
Advertising expenses	7,378	5,850
Freight expenses	459,638	219,118
Commission expenses	359,707	304,386
Depreciation and amortization	793,175	625,508
Rent expenses and usage fee	23,988	18,765
Other expenses	824,741	1,636,094
Total	10,583,811	8,235,209

24. Employee Benefit Expenses

Details of employee benefit expenses for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Salaries	843,094	609,747
Post-employment benefits – Defined benefit plan (Note 16)	52,505	47,981
Post-employment benefits – Defined contribution plan (Note 16)	3,450	2,972
Others	95,056	66,290
Total	994,105	726,990

25. Finance Income and Costs

Details of finance income and costs for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Finance income		
Interest income[1]	58,226	10,852
Dividend income	-	376
Exchange differences	94,357	113,523
Gain related to derivative instruments	42,814	22,730
Others	861	10,975
Total	196,258	158,456
Finance costs		
Interest expense[2]	62,188	40,356
Exchange differences	175,937	146,645
Loss related to derivative instruments	-	8,079
Others	780	2
Total	238,905	195,082

[1] Details of interest income for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Deposits held by financial institutions	41,759	8,016
Other loans and receivables	16,467	2,836
Total	58,226	10,852

[2] Details of interest expense for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Interest on financial institutions	13,993	8,326
Interest on lease liabilities	2,228	2,093
Interest on debentures	45,224	36,695
Other interest expenses	5,263	10,602
Capitalized interest for qualifying assets	(4,520)	(17,360)
Total	62,188	40,356

26. Other Non-Operating Income

Details of other non-operating income for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Exchange differences	229,378	274,729
Gain on disposal of property, plant and equipment	10,894	24,977
Gain on disposal of intangible assets	8	15
Reversal of negative goodwill	33,302	-
Insurance income	3,935	8,155
Others	9,328	7,993
Total	286,845	315,869

27. Other Non-Operating Expenses

Details of other non-operating expenses for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Exchange differences	194,562	236,310
Loss on disposal of property, plant and equipment	14,677	8,686
Loss on disposal of intangible assets	19,543	103
Impairment loss on property, plant and equipment (Note 11)	918	2,931
Impairment loss on intangible assets (Note 12)	40	14
Donations	2,097	561
Others	5,831	14,084
Total	237,668	262,689

28. Tax Expense and Deferred Tax

Income tax expense is recognized based on the best estimate of weighted average annual income tax rate expected for the full financial year. The estimated average annual income tax rate used for the year ending December 31, 2022, is 22.5% (the estimated tax rate for the year ended December 31, 2021: 26.9%).

29. Earnings per Share

Basic earnings per share is calculated by dividing the profit attributable to owners of the Parent Company by the weighted average number of shares in issue excluding shares purchased by the Parent Company and held as treasury shares. As at the reporting date, the Parent Company has no potential ordinary shares. Preferred shares have a right to participate in the profits of the Group. These participation rights have been considered in presenting the earnings per share information for both of ordinary shares and preferred shares.

Basic earnings per share for profit from continuing operations and earnings per share attributable to the owners of the Parent Company for the three-month periods ended March 31, 2022 and 2021, are computed as follows:

Basic earnings per ordinary share from continuing operations

(in millions of Korean won and in number of shares)	**2022**	**2021**
Profit from continuing operations attributable to ordinary shares[1]	620,848	883,076
Weighted average number of ordinary shares outstanding[2]	70,224,814	70,213,855
Basic earnings per ordinary share from continuing operations *(in won)*	8,841	12,577

Basic earnings per ordinary share

(in millions of Korean won and in number of shares)	**2022**	**2021**
Profit attributable to ordinary shares[1]	620,228	1,177,894
Weighted average number of ordinary shares outstanding[2]	70,224,814	70,213,855
Basic earnings per ordinary shares *(in won)*	8,832	16,776

Basic earnings per preferred share from continuing operations

(in millions of Korean won and in number of shares)	**2022**	**2021**
Profit from continuing operations attributable to preferred share[1]	68,018	96,592
Weighted average number of preferred shares outstanding[2]	7,682,759	7,672,433
Basic earnings per preferred share from continuing operations *(in won)*	8,853	12,589

Basic earnings per preferred share

(in millions of Korean won and in number of shares)	**2022**	**2021**
Profit attributable to preferred shares[1]	67,950	128,808
Weighted average number of preferred shares outstanding[2]	7,682,759	7,672,433
Basic earnings per preferred shares *(in won)*	8,845	16,788

[1] Profit attributable to ordinary and preferred shares are as follows:

(in millions of Korean won)	**2022**	**2021**
Profit from continuing operations attributable to the owners of the Parent Company	688,866	979,668
Ordinary shares dividends (A)	210,674	175,535
Preferred shares dividends (B)	23,145	19,277
Undistributed earnings from continuing operation for the period	455,047	784,856
Undistributed earnings available for ordinary shares (C)	410,174	707,541
Undistributed earnings available for preferred shares (D)	44,873	77,315
Profit from continuing operations for the period attributable to ordinary shares (A+C)	620,848	883,076
Profit from continuing operations for the period attributable to preferred shares (B+D)	68,018	96,592

(in millions of Korean won)	**2022**	**2021**
Profit attributable to the owners of the Parent Company	688,178	1,306,702
Ordinary shares dividends (A)	210,674	175,535
Preferred shares dividends (B)	23,145	19,277
Undistributed earnings for the period	454,360	1,111,890
Undistributed earnings available for ordinary shares (C)	409,554	1,002,359
Undistributed earnings available for preferred shares (D)	44,805	109,531
Profit for the period attributable to ordinary shares (A+C)	620,228	1,177,894
Profit for the period attributable to preferred shares (B+D)	67,950	128,808

[2] Weighted average numbers of shares are calculated as follows:

		2022		
Ordinary shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2022. 1. 1 - 2022. 3. 31	70,224,814	90	6,320,233,260
Total				6,320,233,260

Weighted average number of ordinary shares outstanding: 6,320,233,260 / 90 = 70,224,814 shares

		2022		
Preferred shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2022. 1. 1 - 2022. 3. 31	7,682,759	90	691,448,310
Total				691,448,310

Weighted average number of preferred shares outstanding: 691,448,310 / 90 = 7,682,759 shares

		2021		
Ordinary shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2021. 1. 1 - 2021. 3. 31	70,163,895	90	6,314,750,550
Conversion of treasury shares	2021. 1. 9 - 2021. 3. 31	54,834	82	4,496,388
Total				6,319,246,938

Weighted average number of ordinary shares outstanding: 6,319,246,938 / 90 = 70,213,855 shares

		2021		
Preferred shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2021. 1. 1 - 2021. 3. 31	7,672,433	90	690,518,970
Total				690,518,970

Weighted average number of preferred shares outstanding: 690,518,970 / 90 = 7,672,433 shares

For the three-month period ended March 31, 2022, there were no dilutive potential outstanding ordinary shares at the reporting date. Accordingly, diluted earnings per share for profit attributable to owners of the Parent Company is identical to basic earnings per share. In addition, for the three-month period ended March 31, 2021, the Parent Company did not calculate diluted earnings per share due to antidilution effect.

Basic and diluted earnings (losses) per share attributable to ordinary and preferred shares from discounted operations for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in Korean won)	**2022**	**2021**
Basic earnings (losses) per ordinary share from discounted operations	(9)	4,199
Basic earnings (losses) per preferred share from discounted operations	(9)	4,199
Diluted earnings (losses) per ordinary share from discounted operations	(9)	4,199
Diluted earnings (losses) per preferred share from discounted operations	(9)	4,199

30. Dividends

The ₩935,275 million (2021: ₩778,383 million) of dividends for the year ended December 31, 2021, was paid to the shareholders of the Parent Company in April 2022.

31. Related Party Transactions

As at March 31, 2022 and December 31, 2021, LG Corp. is an entity exercising a significant influence over the Group, which owns 33.34% of the Parent Company's ordinary shares.

Details of associates and other related parties that have sales and other transactions with the Group or have receivables and payables balances as at March 31, 2022 and December 31, 2021, are as follows, and the details of investments in subsidiaries, associates and joint ventures are described in Note 1.3:

Related party	Related party's subsidiary (Domestic)	Related party's subsidiary (Overseas)	Details
D&O Corp.[1]	D&O CM Corp. Co.,Ltd.	D&O CM NANJING and others	Subsidiary of LG Corp.
LG CNS Co., Ltd.	Biz Tech Partners Co., Ltd. and others	LG CNS America Inc. and others	Subsidiary of LG Corp.
LG Management Development Institute	-	-	Subsidiary of LG Corp.
LG Sports Ltd.	-	-	Subsidiary of LG Corp.
LG Holdings Japan	-	-	Subsidiary of LG Corp.
LG Display Co., Ltd.	-	LG Display (China) Co., Ltd. and others	LG Enterprise group[2]
LG Electronics Inc.	LG Innotek Co., Ltd. and others	Inspur LG Digital Mobile Communications Co., Ltd. and others	LG Enterprise group[2]
LX International Corp.	LX Pantos Co., Ltd. and others	LX International (Japan) Ltd. and others	LG Enterprise group[2]
LX Hausys, Ltd.	-	LX Hausys Tianjin Co., Ltd. and others	LG Enterprise group[2]
LG Household & Health Care Ltd.	Coca-Cola Beverage Co. and others	-	LG Enterprise group[2]

LX Semicon Co., Ltd.	-	-	LG Enterprise group[2]
LX MMA Corporation[3]	-	-	LG Enterprise group[2]
LG Uplus Corp.	LG HelloVision Corp.	-	LG Enterprise group[2]
G Ⅱ R Inc.	HS AD Inc.	Beijing Yuanzhimeng Advertising Co., Ltd.	LG Enterprise group[2]

[1] During the three-month period ended March 31, 2022, the agenda for the change of the entity's name of S&I Corp. and its subsidiaries has been approved.
[2] Although these entities are not the related parties of the Group in accordance with K-IFRS 1024, these entities belong to a large enterprise group in accordance with the Monopoly Regulation and Fair Trade Act.
[3] During the year ended December 31, 2021, due to the spin-off of LG Corp., its shares were transferred to LX Holdings Corp., a new company, and then the classification criteria for related parties have been changed.

Sales and purchases with related parties for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)

	2022					
		Purchase and others				
	Sales and others	Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Acquisition of right-of-use assets	Interest expense	Others
Entity with a significant influence over the Group						
LG Corp.	-	-	1,273	-	60	23,620
Associates and joint ventures						
SEETEC Co., Ltd.	25,596	53,716	-	-	101	19,754
TECWIN Co., Ltd.	-	22	346	-	-	24
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	-	28,183	-	-	-	-
Others	12,560	2,760	-	-	-	1,093
Other related parties						
D&O Corp. and its subsidiaries and associates	105	2,049	71,706	-	-	21,876
LG CNS Co., Ltd. and its subsidiaries	4,409	340	66,347	-	6	37,469
Others	-	-	-	-	-	10,566
Others						
LG Display Co., Ltd. and its subsidiaries	151,086	31	-	-	3	6
LG Electronics Inc. and its subsidiaries and joint ventures	202,752	106,311	101,364	-	98	6,772

LX International Corp. and its subsidiaries	23,684	107,210	18,534	-	4	441,965
LX Hausys, Ltd. and its subsidiaries	75,712	2,000	1,048	-	-	-
LX MMA Corporation[1]	51,754	51,438	-	-	-	1,305
Others	3,132	8,977	58	-	14	1,472
Total	550,790	363,037	260,676	-	286	565,922

(in millions of Korean won)

	2021					
		Purchase and others				
	Sales and others	Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Acquisition of right-of-use assets	Interest expense	Others
Entity with a significant influence over the Group						
LG Corp.	-	-	-	-	58	19,587
Associates and joint ventures						
SEETEC Co., Ltd.	11,145	36,645	-	41	107	16,741
TECWIN Co., Ltd.	1	2	367	-	-	8
HL Greenpower Co., Ltd.[2]	201,596	440	-	-	-	10
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	-	457	-	-	-	241
Others	-	2,567	-	-	-	394
Other related parties						
D&O Corp. and its subsidiaries	20	2,928	135,667	-	-	28,519
LG CNS Co., Ltd. and its subsidiaries	1,266	897	68,484	-	6	42,331
Others	44	-	-	-	-	7,580
Others						
LG Display Co., Ltd. and its subsidiaries	170,367	24	-	-	4	-
LG Electronics Inc. and its subsidiaries and joint ventures	398,613	273,498	91,524	-	10	54,610
LX International Corp. and its subsidiaries	19,327	97,018	2,099	-	1	240,054
LX Hausys, Ltd. and its subsidiaries	58,216	-	10,956	-	-	660
LX MMA Corporation[1]	21,307	42,881	-	-	-	832
Others	1,957	6,247	766	9	17	1,111
Total	883,859	463,604	309,863	50	203	412,678

[1] Net sales and purchase amounts after offsetting for Raffinate transactions with LX MMA Corporation.

[2] This entity has been excluded from the related parties since the Company sold its shares in 2021. Transactions with this entity until the sale of shares have been included in the above information.

Balances of receivables and payables arising from sales and purchases of goods and services as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)

	March 31, 2022			
	Receivables			
	Trade receivables and others	Loan receivables	Other receivables	Total
Entity with a significant influence over the Group				
LG Corp.	-	-	10,083	10,083
Associates and joint ventures				
SEETEC Co., Ltd.	8,911	-	703	9,614
TECWIN Co., Ltd.	-	-	-	-
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	-	-	-	-
Others	397	-	39	436
Other related parties				
D&O Corp. and its subsidiaries and associates	1	-	-	1
LG CNS Co., Ltd. and its subsidiaries	4,843	-	-	4,843
Others	-	-	-	-
Others				
LG Display Co., Ltd. and its subsidiaries	151,466	-	657	152,123
LG Electronics Inc. and its subsidiaries and joint ventures[2]	256,637	-	3,258	259,895
LX International Corp. and its subsidiaries	1,330	-	-	1,330
LX Hausys, Ltd. and its subsidiaries	76,147	-	24	76,171
LX MMA Corporation	19,489	-	734	20,223
Others	324	-	1,673	1,997
Total	519,545	-	17,171	536,716

(in millions of Korean won)

	March 31, 2022				
	Payables				
	Trade payables	Borrowings	Lease liabilities	Other payables	Total
Entity with a significant influence over the Group					
LG Corp.	-	-	9,026	313,759	322,785
Associates and joint ventures					
SEETEC Co., Ltd.	20,472	-	23,880	9,630	53,982
TECWIN Co., Ltd.	-	-	-	6	6
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	3,649	-	-	-	3,649
Others	227	-	-	122,872	123,099
Other related parties					
D&O Corp. and its subsidiaries and associates	-	-	-	140,926	140,926
LG CNS Co., Ltd. and its subsidiaries	500	-	904	94,842	96,246
Others	-	-	-	1,289	1,289
Others					
LG Display Co., Ltd. and its subsidiaries	38	-	567	3,187	3,792
LG Electronics Inc. and its subsidiaries and joint ventures[2]	68,511	-	18,299	213,996	300,806
LX International Corp. and its subsidiaries	25,213	-	2,585	226,395	254,193
LX Hausys, Ltd. and its subsidiaries	-	-	-	3,472	3,472
LX MMA Corporation	18,338	-	-	-	18,338
Others	2,856	-	3,308	4,196	10,360
Total	139,804	-	58,569	1,134,570	1,332,943

(in millions of Korean won)

	December 31, 2021			
	Receivables			
	Trade receivables and others	Loan receivables	Other receivables	Total
Entity with a significant influence over the Group				
LG Corp.	-	-	9,983	9,983
Associates and joint ventures				
SEETEC Co., Ltd.	7,426	-	462	7,888
TECWIN Co., Ltd.	-	-	-	-
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	-	-	-	-
Others	463	-	4,586	5,049
Other related parties				
D&O Corp. and its subsidiaries[1]	388	-	8,762	9,150
LG CNS Co., Ltd. and its subsidiaries	5,632	-	326	5,958
Others	-	-	6,739	6,739
Others				
LG Display Co., Ltd. and its subsidiaries	110,826	-	935	111,761
LG Electronics Inc. and its subsidiaries and joint ventures[2]	270,116	-	25,438	295,554
LX International Corp. and its subsidiaries	2,676	-	-	2,676
LX Hausys, Ltd. and its subsidiaries	58,934	-	55	58,989
LX MMA Corporation	20,754	-	625	21,379
Others	23	-	1,773	1,796
Total	477,238	-	59,684	536,922

(in millions of Korean won)

	December 31, 2021				
	Payables				
	Trade payables	Borrowings	Lease liabilities	Other payables	Total
Entity with a significant influence over the Group					
LG Corp.	-	-	11,866	23,609	35,475
Associates and joint ventures					
SEETEC Co., Ltd.	17,164	-	24,653	10,310	52,127
TECWIN Co., Ltd.	317	-	-	16,116	16,433
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	48,054	-	-	-	48,054
Others	-	-	-	410	410
Other related parties					
D&O Corp. and its subsidiaries[1]	-	-	-	282,691	282,691
LG CNS Co., Ltd. and its subsidiaries	233	-	1,192	316,160	317,585
Others	-	-	-	715	715
Others					
LG Display Co., Ltd. and its subsidiaries	32	-	595	2,942	3,569
LG Electronics Inc. and its subsidiaries and joint ventures[2]	59,289	-	18,694	148,185	226,168
LX International Corp. and its subsidiaries	18,467	-	-	182,716	201,183
LX Hausys, Ltd. and its subsidiaries	-	-	-	5,501	5,501
LX MMA Corporation	15,960	-	-	-	15,960
Others	3,226	-	3,479	8,583	15,288
Total	162,742	-	60,479	997,938	1,221,159

[1] Other receivables to D&O Corp. (formerly, S&I Corp.) include the amount of deposits which are classified as memberships in the financial statements of the Group.
[2] The warranty provision related to the recall of GM Bolt is not included in the above receivables and payables.

Fund transactions with related parties for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)

	2022						
				Loans		Borrowings[1]	
	Dividends received	Dividends paid	Equity contributions in cash (capital reduction)	Loans	Repayment	Borrowings	Repayment
Entity with a significant influence over the Group							
LG Corp.	-	-	-	-	-	-	2,923
Associates and joint ventures							
SEETEC Co., Ltd.	5,000	-	-	-	-	-	238
Other related parties							
LG CNS Co., Ltd.	-	-	-	-	-	-	295
Others							
LG Display America,Inc.	-	-	-	-	-	-	40
LX Pantos Poland sp.z.o.o	-	-	-	-	-	62	2
PANTOS LOGISTICS MEXICO S.A. de C.V	-	-	-	-	-	2,384	161
LX PANTOS TURKEY LOJISTIK	-	-	-	-	-	337	21
LG Electronics Deutschland GmbH	-	-	-	-	-	-	72
LG ELECTRONICS WROCLAW SP. Z O.O.	-	-	-	-	-	-	348
LG HOUSEHOLD & HEALTH CARE LTD	-	-	-	-	-	-	156
Total	5,000	-	-	-	-	2,783	4,256

(in millions of Korean won)

	2021						
				Loans		Borrowings[1]	
	Dividends received	Dividends paid	Equity contributions in cash (capital reduction)	Loans	Repayment	Borrowings	Repayment
Entity with a significant influence over the Group							
LG Corp.	-	-	-	-	-	-	2,972
Associates and joint ventures							
SEETEC Co., Ltd.	10,000	-	-	-	-	41	1,981
Other related parties							
LG CNS Co., Ltd.	-	-	-	-	-	-	1,914
LG Holdings Japan Co.,Ltd.	-	-	-	-	-	-	92
Others							
LG Display America,Inc.	-	-	-	-	-	-	35
Pantos Logistics France	-	-	-	-	-	-	178
Pantos Logistics Spain S.L.	-	-	-	-	-	-	68
LG Electronics Deutschland GmbH	-	-	-	-	-	-	70
LX Hausys, Ltd.	-	-	-	-	-	-	652
LG HOUSEHOLD & HEALTH CARE LTD	-	-	-	-	-	9	478
Total	10,000	-	-	-	-	50	8,440

[1] The amounts represent lease liabilities that were recognized or repaid for the three-month periods ended March 31, 2022 and 2021.

Compensation for key management of the Group for the three-month periods ended March 31, 2022 and 2021, consists of:

(in millions of Korean won)	**2022**	**2021**
Short-term employee benefits	21,610	13,777
Post-employment benefits	2,966	3,765
Total	24,576	17,542

Key management includes directors and audit committee members having duties and responsibilities over planning, operations and controlling of the Group's business activities.

There are no provisions recognized against receivables from related parties as at March 31, 2022 and December 31, 2021; therefore, there are no impairment losses recognized against the receivables from related parties for the three-month period ended March 31, 2022 and for the year ended December 31, 2021.

As at March 31, 2022, there are no payment guarantees provided by the Group for related parties.

32. Cash Flows

Cash generated from operations for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Profit before income tax		
Profit before income tax from continuing operations	1,023,562	1,427,972
Profit (loss) before income tax from discontinued operations	(793)	420,165
	1,022,769	1,848,137
Adjustments for:		
Depreciation	727,532	577,521
Amortization	65,755	50,167
Post-employment benefits	52,505	48,225
Finance income	(217,361)	(193,165)
Finance costs	223,784	235,853
Foreign exchange differences	4,078	(1,419)
Loss (gain) on valuation of inventories	9,223	(5,347)
Gain on disposal of property, plant and equipment	(10,894)	(30,732)
Gain on disposal of intangible assets	(8)	(15)
Loss on disposal of property, plant and equipment	14,677	8,686
Loss on disposal of intangible assets	19,543	103
Impairment loss on property, plant and equipment	918	3,493
Impairment loss on intangible assets	40	14
Gain on disposal of business	-	(385,704)
Additions to provisions	71,478	69,294
Other income/expenses	32,815	(37,030)
Increase in inventories	(1,009,645)	(440,955)
Increase in trade receivables	(543,809)	(613,795)
Decrease (increase) in other receivables	71,668	(99,859)
Increase in other current assets	(69,769)	(99,544)
Increase in trade payables	876,849	479,698
Increase (decrease) in other payables	(87,839)	313,644
Decrease in other current liabilities	(255,540)	(321,871)
Decrease in provisions	(296,555)	(93,739)
Increase (decrease) in net defined benefit liabilities	(2,102)	129
Other cash flows from operations	(34,785)	1,470
Cash generated from operations	665,327	1,313,259

Changes in liabilities arising from financial activities for the three-month period ended March 31, 2022, are as follows:

(in millions of Korean won)	2022						
	As at January 1, 2022	**Cash flows from financing activities**	**Reclassification of current portion**	**Amortization**	**Lease liabilities**	**Others**	**As at March 31, 2022**
Short-term borrowings	2,817,211	(117,467)	534,439	-	-	26,566	3,260,749
Long-term borrowings	3,875,943	159,357	(534,439)	-	25,186	38,212	3,564,259
Debentures	8,072,580	(260,000)	-	2,195	-	54,369	7,869,144
Other payables for the reverse factoring arrangement	299,645	(299,645)	-	-	-	-	-
Total	15,065,379	(517,755)	-	2,195	25,186	119,147	14,694,152

Significant non-cash transactions for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**	**2021**
Reclassification of construction-in-progress	894,202	1,192,523
Reclassification of machinery-in-transit	35,984	12,589
Reclassification of long-term borrowings into current portion	1,243,965	401,747
Other payables related to acquisitions of property, plant and equipment and intangible assets	561,360	1,697,363
Reclassification of other payables under the reverse factoring arrangement	-	641,839
Exchange of treasury stocks such as exchangeable bonds	-	54,383

33. Segment Information

General information about the Group's reportable segments is as follows:

Segment	Products or services	Major customers
Petrochemicals	ABS, PC, PE, PP, Acrylic, Alcohol, SAP, PVC, Synthetic rubber, Special resin, BPA, Ethylene, Propylene and others	LG Electronics Inc., OCI Group Co. Ltd., Mitsubishi Corp. and others
LG Energy solution	Mobile batteries, Automotive batteries, Electricity storage batteries and others	Hewlett-Packard Co., General Motors Corp., and others
Advanced materials[1]	Automotive components, LCD Photoresist, OLED materials, Battery materials and others	LG Display Co., Ltd., Samsung Display Co., Ltd., BOE, AUO and others
Life sciences	Growth hormone, Vaccine, Antidiabetic, agricultural chemicals and others	UNICEF, Intervet, SOUSAM IMPORTACAO E EXPORTACAO LTDA and others

Segment	Products or services	Major customers
Common and others	Crop protection products, Seeds, Fertilizers, General management, sales and R&D and others	National Agriculture Cooperative Federation and others

[1] During the year ended December 31, 2021, the Group disposed of all of its shares of Ugimag Korea Co., Ltd. and related profit and loss are presented as discontinued operations. The information for the comparative period has been recast to reflect these changes.

Segment information on revenue, profit and loss for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	2022					
	Petro-chemicals	**LG Energy solution**	**Advanced materials**	**Life sciences**	**Common and others[3]**	**Total**
Total segment revenue	5,963,473	4,342,326	1,568,017	217,438	300,193	12,391,447
Inter-segment revenue	146,950	3,490	609,922	14,658	8,356	783,376
Revenue from external customers[1]	5,816,523	4,338,836	958,095	202,780	291,837	11,608,071
Operating profit (loss)[2]	634,600	259,153	153,761	32,197	(55,451)	1,024,260
Depreciation and amortization	244,174	417,674	53,279	21,355	56,693	793,175

(in millions of Korean won)	2021					
	Petro-chemicals	**LG Energy solution**	**Advanced materials**	**Life sciences**	**Common and others[3]**	**Total**
Total segment revenue	4,435,187	4,215,247	1,166,575	161,901	282,113	10,261,023
Inter-segment revenue	135,980	2,054	420,321	2,019	55,956	616,330
Revenue from external customers[1]	4,299,207	4,213,193	746,254	159,882	226,157	9,644,693
Operating profit (loss)[2]	983,751	340,557	89,650	22,461	(26,935)	1,409,484
Depreciation and amortization	193,619	314,592	44,967	20,019	52,311	625,508

[1] Revenue from external customers consists of sales of goods. Interest income and dividend income are included in finance income.
[2] Management assesses the performance of the operating segments based on a measurement of operating profit of segment.
[3] Common and other segments include operating segments not qualifying as a reportable segment, supporting divisions as well as R&D divisions.

Segment information on assets and liabilities as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won	March 31, 2022					
	Petro-chemicals	**LG Energy solution**	**Advanced materials**	**Life sciences**	**Common and others**	**Total**
Reportable segment asset[1]	15,549,839	34,936,490	4,864,226	1,575,983	7,490,917	64,417,455
Investments in associates and joint ventures	64,598	222,407	94,925	17	148,973	530,920
Reportable segment liability[1]	4,555,927	15,499,855	1,330,973	177,582	7,362,018	28,926,355

(in millions of Korean won	December 31, 2021					
	Petro-chemicals	**LG Energy solution**	**Advanced materials**	**Life sciences**	**Common and others**	**Total**
Reportable segment asset[1]	15,297,794	23,728,448	4,972,040	1,576,987	5,560,033	51,135,302
Investments in associates and joint ventures	62,024	225,567	93,835	17	153,867	535,310
Reportable segment liability[1]	5,016,619	14,980,391	1,406,698	220,954	6,300,652	27,925,314

[1] Assets and liabilities are measured in a manner consistent with those in the financial statements, and allocated on the basis of segment operation.

External sales and non-current assets by geographical segments from continuing operations for the three-month periods ended March 31, 2022 and 2021, and as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**Sales**		**Non-current assets[1]**	
	2022	**2021**	**March 31, 2022**	**December 31, 2021**
Korea[2]	2,816,169	2,159,900	16,152,864	16,157,398
China	3,609,504	2,647,491	4,854,833	4,688,935
Asia	1,467,368	1,222,047	171,283	147,809
America	1,062,284	991,623	2,269,448	1,692,631
Europe	2,514,438	2,530,902	4,332,074	4,192,086
Others	138,308	92,730	-	-
Total	11,608,071	9,644,693	27,780,502	26,878,859

[1] Represents aggregate amount of property, plant and equipment, intangible assets and investment properties.
[2] Domestic sales include the exports made through local letters of credit.

There is no single external customer who contributes over 10% of the Group's revenue for the three-month periods ended March 31, 2022 and 2021.

34. Assets Held for Sale and Discontinued Operations

34.1 Assets Held for Sale

Upon the approval of management, the Group decided to dispose of acrylic film business (December 2020). As a result, the related assets and liabilities were reclassified as assets and liabilities held for sale. The disposal of acrylic film business and land acquired as part of acquisition of Farm Hannong Co., Ltd. is expected to be completed in the first half of FY2022.

Details of assets of disposal group classified as held for sale as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Assets of disposal group		
Property, plant and equipment	5,367	5,364
Total	5,367	5,364

Assets of the disposal group were measured at net fair value immediately before the initial classification as assets as held for sale and there are no other non-operating expenses (income) recognized from the measurement for the three-month periods ended March 31, 2022 and 2021.

34.2 Discontinued Operations

The Group decided to discontinue Glass substrate business with the resolution of the Board of Directors in January 2020 and substantially discontinued the related business as at March 2020. In addition, the Group decided to dispose of LCD polarizer business with the resolution of the Board of Directors in June 2020, and the disposal has been completed in February 2021. The Group disposed of all of its shares of Ugimag Korea Co., Ltd., in July 2021. Accordingly, the profit and loss from the related operations are presented as discontinued operations and the comparative consolidated statements of profit or loss have been recast.

Comprehensive income information from discontinued operation for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	**2022**		
	LCD polarizer	**Glass substrate**	**Total**
Revenue	16	184	200
Expense	(414)	(579)	(993)
Loss before income tax of discontinued operation	(398)	(395)	(793)
Income tax benefits (expense)	(4)	109	105
Loss after income tax of discontinued operations	(402)	(286)	(688)

(in millions of Korean won)	2021			
	LCD polarizer	Glass substrate	Ugimag	Total
Revenue	587,655	7,499	5,394	600,548
Expense	(168,357)	(5,288)	(6,738)	(180,383)
Profit (loss) before income tax of discontinued operation	419,298	2,211	(1,344)	420,165
Income tax expense	(92,656)	(475)	-	(93,131)
Profit (loss) after income tax of discontinued operations	326,642	1,736	(1,344)	327,034

Net cash flows from discontinued operations for the three-month periods ended March 31, 2022 and 2021, are as follows:

(in millions of Korean won)	2022		
	LCD polarizer	Glass substrate	Total
Net cash inflow (outflow) from operating activities	11,869	(561)	11,308
Net cash inflow from investing activities	426	282	708
Net cash inflow (outflow) from financing activities	(12,295)	279	(12,016)

(in millions of Korean won)	2021			
	LCD polarizer	Glass substrate	Ugimag	Total
Net cash inflow (outflow) from operating activities	203,352	2,019	(1,511)	203,860
Net cash inflow (outflow) from investing activities	581,085	5,874	(220)	586,739
Net cash inflow (outflow) from financing activities	(796,937)	(7,893)	1,731	(803,099)

35. Assets and Liabilities related to Contracts with Customers

Assets and liabilities related to contracts with customers as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Contract assets	-	-
Total contract assets	-	-
Contract liabilities		
Advances in relation to revenue from the Group's main business activities	423,805	376,487
Expected customer incentives	55,159	5,636
Unearned revenue	152,501	167,151
Total contract liabilities	631,465	549,274

Revenue recognized in relation to contract liabilities

The following table shows how much of the revenue recognized in the current reporting period relates to carried-forward contract liabilities and how much relates to performance obligations that were satisfied in the prior periods.

(in millions of Korean won)	**2022**	**2021**
Revenue recognized in the current period from the contract liabilities balance at the beginning of the period	125,175	94,393
Advances in relation to revenue from the Group's main business activities	108,213	91,034
Unearned revenue	16,962	3,359
Revenue recognized from performance obligations satisfied in previous periods	-	-

36. Investment Properties

Details of investment properties as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	March 31, 2022				December 31, 2021			
	Cost	Accumulated depreciation	Accumulated impairment	Book amount	Cost	Accumulated depreciation	Accumulated impairment	Book amount
Land	4,211	-	-	4,211	4,211	-	-	4,211
Buildings	66,421	(14,070)	(51)	52,300	65,542	(13,409)	(47)	52,086
Total	70,632	(14,070)	(51)	56,511	69,753	(13,409)	(47)	56,297

Changes in investment properties for the three-month period ended March 31, 2022 and for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	2022			2021		
	Land	Building	Total	Land	Building	Total
Beginning balance	4,211	52,086	56,297	4,211	45,222	49,433
Acquisitions/transfers	-	623	623	-	8,233	8,233
Disposals/transfers	-	(51)	(51)	-	(73)	(73)
Depreciation	-	(358)	(358)	-	(1,296)	(1,296)
Ending balance	4,211	52,300	56,511	4,211	52,086	56,297

The fair value of investment properties is measured either by independent professional appraisers with certified qualification or measured based on official appraised value of land and available information from recent transactions of similar properties, and it is classified as 'level 3' of the fair value hierarchy. The fair value of investment properties as at March 31, 2022, is ₩66,849 million (December 31, 2021: ₩66,861 million).

During the three-month period ended March 31, 2022, rental income from investment properties under operating lease is ₩1,671 million (2021: ₩1,613 million), and operating expenses incurred for investment properties that generated rental income (including maintenance and repair expenses) are ₩355 million (2021: ₩304 million). During the three-month period ended March 31, 2022, operating expenses incurred for investment properties that do not generate rental income (including maintenance and repair expenses) are ₩3 million (2021: ₩3 million).

Operating lease

Investment properties are leased to tenants under operating leases with monthly rent payments. Where considered necessary to reduce credit risk, the Group may obtain bank guarantees for the term of the lease.

Although the Group is exposed to changes in the residual value at the end of the current leases, the Group typically enters into new operating leases and therefore will not immediately realize any reduction in residual value at the end of these leases. Expectations about the future residual values are reflected in the fair value of investment properties.

The future minimum lease payments expected to be received in relation to the above operating lease agreement for investment properties as at March 31, 2022 and December 31, 2021, are as follows:

(in millions of Korean won)	**March 31, 2022**	**December 31, 2021**
Within one year	6,488	6,874
Within two years	4,299	6,016
Total	10,787	12,890

37. Business Combination

On February 28, 2022, the Group acquired 100% shares of LG Energy Solution Vertech Inc., an electricity storage batteries installation service provider in USA. The acquisition is expected to increase sales through expanded vertical integration by strengthening contact points with customers of electricity storage batteries.

Details of consideration transferred, assets and liabilities recognized as a result of the business combination, are as follows:

Gain from a bargain purchase amounting to ₩33,302 million occurred from the acquisition is recognized as other non-operating income in the consolidated statement of profit or loss.

(in millions of Korean won)	**Amount**
Consideration transferred	
Cash and cash equivalents	16,153
Total consideration	16,153
Identifiable assets acquired and liabilities assumed	
Cash and cash equivalents	7,749
Trade and other receivables[1]	56,333
Inventories	5,477
Property, plant and equipment	7,251
Intangible assets	1,503
Other assets	12,295
Trade and non-trade payables	(25,578)
Other payables	(13,213)
Deferred tax liabilities	(2,362)
Fair value of net identifiable assets acquired	49,455
Goodwill (gain from a bargain purchase)	(33,302)
	16,153

[1] The fair value of trade and other receivables is equal to the total contractual amount.

The revenue and net loss for the three-month period ended March 31, 2022 contributed by LG Energy Solution Vertech Inc. since the acquisition were ₩3,473 million and ₩1,497 million, respectively.

Revenue and profit or loss of the Group for the three-month period ended March 31, 2022 would have been ₩11,607,389 million and ₩748,458 million, respectively as though the acquisition of LG

Energy Solution Vertech Inc. had occurred as at the beginning of the three-month period ended March 31, 2022.

The Group accounts for the business combination with provisional amounts as at March 31, 2022 and the amounts may be adjusted if there is new information obtained about facts and circumstances related to business combination within the measurement period of one year from the acquisition date.

On November 1, 2021, the Parent Company and its subsidiary, LG Chem Poland Sp. z o.o., acquired CEM(Chemical Electronics Material) business from LG Electronics Inc. to drive competitive separator business. The Parent Company acquired the domestic CEM business for ₩389,973 million and the 70% shares of LG Chem Hangzhou Advanced Materials Co., Ltd.(formerly, LG Electronics(Hangzhou) Co., Ltd) for ₩67,027 million. LG Chem Poland Sp. z o.o., a subsidiary, acquired CEM business in Poland for ₩67,700 million.

The goodwill of ₩202,568 million arising from the business combination is attributable to sales increase from combining the operations of the Group and CEM business.

Details of consideration transferred, assets and liabilities recognized as a result of the business combination, are as follows:

(in millions of Korean won)	**LG Chem Ltd.**	**LG Chem Poland Sp. Z.o.o**
Consideration transferred		
Cash and cash equivalents	457,000	67,700
Total consideration	457,000	67,700
Identifiable assets acquired and liabilities assumed		
Cash and cash equivalents	4,376	-
Trade and other receivables[1]	190,386	26,228
Inventories	43,084	36,627
Property, plant and equipment	211,373	38,755
Intangible assets	48,841	447
Other assets	4,204	-
Trade and other payables	(213,669)	(24,602)
Provisions	(1,809)	(597)
Net defined benefit liabilities	(9,622)	-
Other liabilities	(5,930)	(522)
Deferred tax liabilities	(3,851)	-
Fair value of net identifiable assets acquired	267,383	76,336
Less: non-controlling interest	(12,951)	-
Acquired amount attributable to the Parent Company	254,432	76,336
Goodwill	202,568	-
Gain from a bargain purchase	-	(8,636)
	457,000	67,700

[1] The fair value of trade and other receivables as of the acquisition date and the total contractual amount are ₩217,624 million, of which the amount that is not expected to be recovered is ₩1,010 million.

38. Events after the Reporting Period

(a) In April 2022, the Group established a subsidiary in Arizona, USA to respond to securing orders for cylindrical batteries and paid the capital.

(b) In April 2022, the Group entered into a contract to acquire 15% shares of Capchem Poland SP. Z o.o. to localize battery raw material procurement.

(c) In May 2022, the Group acquired 3.04% shares of Li-Cycle, a battery recycling company in North America.

Independent Auditor's Report

(English Translation of a Report Originally Issued in Korean)

To the Shareholders and Board of Directors of
LG Chem, Ltd.

Opinion

We have audited the accompanying consolidated financial statements of LG Chem, Ltd. and its subsidiaries (collectively referred to as the "Group"), which comprise the consolidated statements of financial position as at December 31, 2021 and 2020, and consolidated statements of profit or loss, consolidated statements of comprehensive income, consolidated statements of changes in equity and consolidated statements of cash flows for the years then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as at December 31, 2021 and 2020, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (Korean IFRS).

Basis for Opinion

We conducted our audits in accordance with Korean Standards on Auditing. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Consolidated Financial Statements* section of our report. We are independent of the Group in accordance with the ethical requirements of the Republic of Korea that are relevant to our audit of the consolidated financial statements and we have fulfilled our other ethical responsibilities in accordance with the ethical requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Emphasis of Matter

Without modifying our opinion, we draw attention to the following matters of the consolidated financial statements.

Uncertainty relating to COVID-19

Note 4 to the consolidated financial statements describes uncertainty relating to the impact of Coronavirus disease 2019 (COVID-19) on the Group's productivity and ability to satisfy customer's orders.

Settlement with SK Innovation

As described in Note 37 to the consolidated financial statements, on May 15, 2021, the Group and SK Innovation Co., Ltd., which has spun off its battery business into SK on Co., Ltd., later in 2021, have entered into an agreement to settle all legal disputes relating to trade secret infringement. In accordance with the agreement, SK on Co., Ltd. agreed to pay the Group lump-sum payments of KRW 1 trillion and running royalties of KRW 1 trillion based on certain percentage of annual revenues of SK on Co., Ltd. for certain periods. During the year ended December 31, 2021, the Group recognized operating income of KRW 992,233 million for the lump-sum payments (discounted present value of the lump-sum payments of KRW 1 trillion).

Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

(1) Goodwill impairment assessment for Life Sciences Cash Generating Unit

Why this matter was determined to be a key audit matter

We focused on goodwill impairment assessment due to the significance of size of goodwill balance (₩ 803,924 million as at December 31, 2021) and because the measurement of the 'recoverable amount' of the Group's Cash Generating Units (CGUs) involves management's judgements about the future results of the business, discount rate and adjustments arising from the perspective of market participants. Details are described in Note 12.

In particular, we focused our audit effort on the goodwill recognized in relation to the Life Sciences CGU (₩ 391,311 million as at December 31, 2021) which is the most significant element among all relevant CGUs with goodwill. The Life Sciences business was acquired by the Group in 2017 and has recognized ₩ 294,918 million of impairment loss on goodwill for the year ended December 31, 2021. Considering the size of the balance and impairment loss recognized on this goodwill as well as the significant level of management's judgment involved for the estimation of value-in-use, we have included this matter as a key audit matter.

How this matter was addressed the in our audit

Audit procedures we performed to address this key audit matter include:

- Understanding, evaluation and testing of the design and operating effectiveness of relevant internal controls in place in connection with impairment assessment of goodwill including review and approval by management of future cash flow forecasts and assumptions applied in the assessment.
- Evaluation of valuation model used by management to estimate value-in-use.
- Evaluation of the competence and objectivity of the expert utilized by the management
- Comparison of future cash flow forecasts used to estimate value-in-use except for the cash flows relating to specific fixed assets adjusted from the perspective of market participants with the budgets approved by the management.
- Comparison of the current year actual results with the prior year forecasts to assess whether management's forecasts include optimistic assumptions.
- Evaluation of management's assumptions used to estimate value-in-use.
  - Comparison of estimated revenue growth rate, operating margin rate and capital expenditures applied to estimate value-in-use with historical performances of the CGU and the current market condition to evaluate whether applied assumptions are consistent.
  - Evaluation of long-term growth rate by considering economic and industry forecasts
  - Comparison of the discount rate used by the management with the discount rate independently calculated by us using observable information in the market.
- Evaluation of CGUs identification and testing of book values allocated to CGUs
- Evaluation of sensitivity analysis performed by management on the discount rate and terminal growth rate

(2) Purchase price allocation

Why this matter was determined to be a key audit matter

As disclosed in Note 38 to the consolidated financial statements, on November 1, 2021, the Group acquired CEM(Chemical Electronics Material) business from LG Electronics Inc. for ₩ 524,700 million and accounted for the acquisition in accordance with Korean IFRS 1103 *Business Combinations*. LG Chem, Ltd. acquired the domestic CEM business for ₩ 389,973 million and the 70% shares of LG Chem Hangzhou Advanced Materials Co., Ltd.(former, LG Electronics(Hangzhou) Co., Ltd.) for ₩ 67,027 million. LG Chem Poland Sp. z o.o., a subsidiary of the Group, acquired CEM business in Poland for ₩ 67,700 million.

The consideration transferred has been allocated to assets and liabilities acquired based on their fair values. The Group utilized an independent external expert for the valuation of the fair value of major tangible and intangible assets acquired.

Considering the size of the consideration transferred and the significant level of management's judgment involved for the allocation of consideration transferred, we have included this matter as a key audit matter.

How this matter was addressed the in our audit

Audit procedures we performed to address this key audit matter include:

- Understanding and evaluation of the design and operating effectiveness of relevant internal controls in place in connection with business combination including management's review of future cash flow forecasts and assumptions applied in the fair value determination, etc.
- Review of the agreements for business combination
- Evaluation of the competence and objectivity of the external experts utilized by the management
- Procedures performed by the auditor's expert included:
  - Evaluation of the valuation model used to determine the fair value of identifiable intangible assets and other assets/liabilities.
  - Evaluation of the key assumptions and variables used in the fair value determination.
  - Testing of mathematical accuracy of the fair value calculation.
  - Assessment of the appropriateness of disclosures in the notes to the consolidated financial statements in relation to this business combination.

(3) Warranty provision of LG Energy Solution, Ltd.

Why this matter was determined to be a key audit matter

LG Energy Solution, Ltd. and its subsidiaries ("LG Energy Solution"), as a subsidiary of the Group, are engaged in Energy Solution business and recognizes provisions for product warranties. These provisions are estimated based on historical experience. Provisions related to voluntary recalls for customers are estimated based on the number of vehicles subject to recall, estimated total repair cost, and cost sharing ratio.

As disclosed in Note 15 to the consolidated financial statements, the warranty provision in the consolidated financial statements as at December 31, 2021 amounted to ₩ 2,110,180 million of which warranty provision of LG Energy Solution amounted to ₩ 2,103,880 million. Considering the size of the warranty provision and the significant level of management's judgment involved in the estimation, we have included this matter as a key audit matter.

How this matter was addressed the in our audit

Audit procedures we performed to address this key audit matter include:

- Understanding of the Group's accounting policies and internal controls in place related to the warranty provision.
- Comparison of the data used by management for the estimation of warranty provision with internal and external information.
- Comparison of the actual results with the estimates to assess whether key assumptions used by management for the estimation of warranty provision are reasonable.
- Mathematical recalculation for the estimated warranty provision.
- Assessment of the appropriateness of disclosures in the notes to the consolidated financial statements in relation to warranty provision.

Other Matter

Auditing standards and their application in practice vary among countries. The procedures and practices used in the Republic of Korea to audit such financial statements may differ from those generally accepted and applied in other countries

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with Korean IFRS, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.
In preparing the consolidated financial statements, management is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group or to cease operations.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Korean Standards on Auditing will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with Korean Standards on Auditing, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify

our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the Group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The engagement partner on the audit resulting in this independent auditor's report is Kibok Lee, Certified Public Accountant.

/s/ Samil PricewaterhouseCoopers

Seoul, Korea

March 8, 2022

This report is effective as of March 8, 2022, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statements and notes thereto. Accordingly, the readers of the audit report should understand that there is a possibility that the above audit report may have to be revised to reflect the impact of such subsequent events or circumstances, if any.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Financial Position
December 31, 2021 and 2020

(in millions of Korean won)	Notes	2021	2020
Assets			
Current assets			
Cash and cash equivalents	3, 5, 6	3,760,834	3,274,250
Trade receivables	3, 5, 7, 31	6,386,979	5,298,365
Other receivables	3, 5, 7, 31	1,048,549	924,303
Other current financial assets	3, 5, 8	23,289	23,821
Prepaid income taxes		156,299	17,049
Other current assets	13	749,032	643,152
Inventories	9	8,283,474	5,349,688
Assets held for sale	34	5,364	789,072
Total current assets		20,413,820	16,319,700
Non-current assets			
Trade receivables	3, 5, 7	67,055	29,376
Other receivables	3, 5, 7	713,166	255,030
Other non-current financial assets	3, 5, 8	506,022	81,532
Investments in associates and joint ventures	1, 10, 33	535,310	309,329
Deferred tax assets	28	1,905,149	1,409,757
Property, plant and equipment	11	24,378,259	20,567,475
Intangible assets	12	2,444,303	2,279,917
Investment properties	36	56,297	49,433
Other non-current assets	13	115,921	87,345
Total non-current assets		30,721,482	25,069,194
Total assets		51,135,302	41,388,894
Liabilities			
Current liabilities			
Trade payables	3, 5, 31	3,742,132	3,458,526
Other payables	3, 5, 31	3,991,784	5,266,974
Borrowings	3, 5, 14	3,477,080	1,548,815
Other current financial liabilities	3, 5, 8	-	16,797
Provisions	15	1,572,755	1,041,451
Income tax payables	28	957,676	373,244
Other current liabilities	17	1,320,669	788,029
Liabilities held for sale	34	-	130383
Total current liabilities		15,062,096	12,624,219
Non-current liabilities			
Other payables	3, 5	15,623	11,927
Borrowings	3, 5, 14	11,288,654	8,637,302
Other non-current financial liabilities	3, 5, 8	126	41,768
Provisions	15	636,953	328,556
Net defined benefit liabilities	16	18,122	117,959
Deferred tax liabilities	28	713,862	689,817
Other non-current liabilities	17	189,878	146,906
Total non-current liabilities		12,863,218	9,974,235
Total liabilities		27,925,314	22,598,454

The above consolidated statements of financial position should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Financial Position
December 31, 2021 and 2020

(in millions of Korean won)	Notes	2021	2020
Equity			
Share capital	1, 19	391,406	391,406
Capital surplus		2,696,385	2,692,485
Other components of equity	21	(37,310)	(54,998)
Accumulated other comprehensive income		551,354	(165,076)
Retained earnings	20	18,091,949	15,175,304
Equity attributable to owners of the Parent Company		21,693,784	18,039,121
Non-controlling interests		1,516,204	751,319
Total equity		23,209,988	18,790,440
Total liabilities and equity		51,135,302	41,388,894

The above consolidated statements of financial position should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Profit or Loss
Year Ended December 31, 2021 and 2020

(in millions of Korean won, except per share amounts)	Notes	2021	2020
Revenue	31, 33	42,654,722	30,058,872
Cost of sales	23, 31	(31,436,412)	(23,741,385)
Gross profit		11,218,310	6,317,487
Selling and administrative expenses	22, 23, 31	(6,192,844)	(4,512,128)
Operating profit	33	5,025,466	1,805,359
Finance income	5, 25	686,684	417,461
Finance costs	5, 25	(660,789)	(1,108,879)
Share of net profit of associates and joint ventures accounted for using the equity method	10	(6,609)	9,343
Other non-operating income	5, 26	903,155	1,155,129
Other non-operating expenses	5, 27	(1,057,255)	(1,326,816)
Profit before income tax	32	4,890,652	951,597
Income tax expense	28	(1,235,790)	(367,839)
Profit from continuing operations		3,654,862	583,758
Profit from discontinued operations	34	299,042	98,650
Profit for the year		3,953,904	682,408
Profit is attributable to:			
Owners of the Parent Company			
Profit from continuing operations		3,370,745	413,984
Profit from discontinued operations		299,042	98,650
		3,669,787	512,634
Non-controlling interests			
Profit from continuing operations		284,117	169,774
		284,117	169,774
Earnings per share for profit attributable to the owners of the Parent Company *(in won)*	29		
Basic earnings per ordinary share		47,108	6,666
Basic earnings per preferred share		47,158	6,716
Earnings per share for profit from continuing operations attributable to the owners of the Parent Company *(in won)*	29		
Basic earnings per ordinary share		43,269	5,382
Basic earnings per preferred share		43,319	5,432

The above consolidated statements of profit or loss should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Comprehensive Income
Year Ended December 31, 2021 and 2020

(in millions of Korean won)	Notes	2021	2020
Profit for the year		3,953,904	682,408
Other comprehensive income			
Items that will not be reclassified to profit or loss			
Remeasurements of net defined benefit liabilities	16	37,871	25,345
Gain on valuation of financial assets at fair value through other comprehensive income		15,990	2,364
Shares of remeasurements of net defined benefit liabilities of associates		(234)	365
Income tax relating to these items		(13,451)	(7,580)
Items that may be subsequently reclassified to profit or loss			
Exchange differences on translation of foreign operations		769,186	(115,678)
Cash flow hedge		(18,083)	2,451
Shares of other comprehensive income of associates and joint ventures		14,724	29,554
Income tax relating to these items		41,165	(7,071)
Other comprehensive income (loss) for the year, net of tax		847,168	(70,250)
Total comprehensive income for the year		4,801,072	612,158
Total comprehensive income for the year is attributable to:			
Owners of the Parent Company		4,413,552	451,834
Non-controlling interest		387,520	160,324

The above consolidated statements of comprehensive income should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Changes in Equity
Years Ended December 31, 2021 and 2020

(in millions of Korean won)

		Attributable to owners of the Parent Company							
	Notes	Share capital	Capital surplus	Other components of Equity	Accumulated other comprehensive income (loss)	Retained earnings	Total	Non-controlling interests	Total equity
Balance at January 1, 2020		391,406	2,274,620	(374,243)	(85,496)	14,798,690	17,004,977	378,812	17,383,789
Comprehensive income									
Profit for the year		-	-	-	-	512,634	512,634	169,774	682,408
Remeasurements of net defined benefit liabilities	16	-	-	-	-	18,415	18,415	-	18,415
Exchange differences on translation of foreign operations		-	-	-	(112,625)	-	(112,625)	(9,450)	(122,075)
Gain on valuation of financial assets at fair value through other comprehensive income		-	-	-	1,714	-	1,714	-	1,714
Cash flow hedge		-	-	-	1,777	-	1,777	-	1,777
Others					29,554	365	29,919	-	29,919
Total comprehensive income for the year		-	-	-	(79,580)	531,414	451,834	160,324	612,158
Transactions with owners:									
Disposal of treasury shares		-	417,865	319,245	-	-	737,110	-	737,110
Dividends	30	-	-	-	-	(153,608)	(153,608)	(24,040)	(177,648)
Increase in paid-in capital of a subsidiary		-	-	-	-	-	-	236,620	236,620
Others		-	-	-	-	(1,192)	(1,192)	(397)	(1,589)
Total transactions with owners		-	417,865	319,245	-	(154,800)	582,310	212,183	794,493
Balance at December 31, 2020		391,406	2,692,485	(54,998)	(165,076)	15,175,304	18,039,121	751,319	18,790,440
Balance at January 1, 2021		391,406	2,692,485	(54,998)	(165,076)	15,175,304	18,039,121	751,319	18,790,440
Comprehensive income									
Profit for the year		-	-	-	-	3,669,787	3,669,787	284,117	3,953,904
Remeasurements of net defined benefit liabilities	16	-	-	-	-	27,294	27,294	-	27,294
Exchange differences on translation of foreign operations		-	-	-	700,511	-	700,511	103,422	803,933
Gain on valuation of financial assets at fair value through other comprehensive income		-	-	-	13,115	-	13,115	-	13,115
Cash flow hedge		-	-	-	(11,605)	-	(11,605)	(19)	(11,624)
Others		-	-	-	14,684	(234)	14,450	-	14,450
Total comprehensive income for the year		-	-	-	716,705	3,696,847	4,413,552	387,520	4,801,072
Transactions with owners:									
Business combination		-	-	-	-	-	-	12,951	12,951
Disposal of treasury shares		-	32,088	17,688	-	-	49,776	-	49,776
Dividends	30	-	-	-	-	(778,383)	(778,383)	(91,334)	(869,717)
Changes in ownership percentage of subsidiaries		-	(28,057)	-	-	-	(28,057)	(169,546)	(197,603)
Increase in paid-in capital of a subsidiary		-	(131)	-	-	-	(131)	626,882	626,751
Others		-	-	-	(275)	(1,819)	(2,094)	(1,588)	(3,682)
Total transactions with owners		-	3,900	17,688	(275)	(780,202)	(758,889)	377,365	(381,524)
Balance at December 31, 2021		391,406	2,696,385	(37,310)	551,354	18,091,949	21,693,784	1,516,204	23,209,988

The above consolidated statements of changes in equity should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Cash Flows
Years Ended December 31, 2021 and 2020

(in millions of Korean won)	Notes	2021	2020
Cash flows from operating activities			
Cash generated from operations	32	6,957,179	6,526,644
Interest received		44,792	28,918
Interest paid		(223,452)	(215,865)
Dividends received		13,093	14,263
Income taxes paid		(1,281,796)	(513,128)
Net cash inflow from operating activities		5,509,816	5,840,832
Cash flows from investing activities			
Decrease in other receivables		642,252	79,603
Decrease in other non-current receivables		113,827	75,745
Proceeds from disposal of investments in associates		35,302	382,941
Proceeds from disposal of financial instruments		22,202	91,263
Proceeds from disposal of property, plant and equipment		85,616	37,482
Proceeds from disposal of intangible assets		163	17,182
Government grants received		351,127	273,577
Proceeds from disposal of investments in subsidiaries		1	-
Proceeds from disposal of assets held for sale		103,357	93,165
Proceeds from transfer of business		906,658	354,466
Increase in other receivables		(151,907)	(658,735)
Increase in other non-current receivables		(529,359)	(136,854)
Acquisition of investments in associates and joint ventures		(257,676)	(44,006)
Acquisition of financial assets		(248,012)	(18,519)
Acquisition of property, plant and equipment		(5,773,593)	(5,535,791)
Acquisition of intangible assets		(128,939)	(123,592)
Cash outflows from transfer of business		(520,324)	(184,302)
Net cash outflow from investing activities		(5,349,305)	(5,296,375)
Cash flows from financing activities			
Proceeds from borrowings		5,661,093	4,073,803
Disposal of treasury shares		8,835	-
Capital contribution from non-controlling interests		626,883	236,621
Repayments of borrowings and others		(5,105,821)	(3,194,707)
Decrease in non-controlling interests		(197,603)	-
Dividends paid		(869,717)	(177,648)
Net cash inflow from financing activities		123,670	938,069
Net increase in cash and cash equivalents		284,181	1,482,526
Cash and cash equivalents at the beginning of the year		3,274,250	1,888,631
Effects of exchange rate changes on cash and cash equivalents		202,403	(84,407)
Cash and cash equivalents included in disposal groups classified as held for sale		-	(12,500)
Cash and cash equivalents at the end of the year in the consolidated statement of financial position		3,760,834	3,274,250

The above consolidated statements of cash flows should be read in conjunction with the accompanying notes.

1. General Information

General information about LG Chem, Ltd. (the Parent Company) and its fifty six subsidiaries (collectively referred to as "Group") is as follows:

1.1 The Parent Company

The Parent Company was spun off on April 1, 2001, from LG Chem Investment Ltd. (now LG Corp., formerly LG Chemical Ltd.).

As at December 31, 2021, the Group has its manufacturing facilities in Yeosu, Daesan, Ochang, Cheongju, Ulsan, Naju, Iksan, Paju, Osong, Onsan, Gimcheon and overseas sites.

The Parent Company is authorized to issue 292 million shares of ordinary shares with par value of ₩5,000 per share. As at December 31, 2021, the Parent Company has issued and outstanding 70,592,343 ordinary shares (₩391,406 million) and 7,688,800 preferred shares (₩38,444 million). The largest shareholder of the Parent Company is LG Corp., which owns 33.34% of the Parent Company's ordinary shares. Preferred shareholders have no voting rights but are entitled to receive dividends at a rate 1% more than those paid to ordinary shareholders.

1.2 Business Overview

The Group is engaged in Petrochemicals, Energy solutions, and Advanced materials business, and also engaged in Life Sciences business acquired through a merger with LG Life Sciences, Ltd. in January 2017. In addition, the Parent Company acquired 100% shares of FarmHannong Co., Ltd., in April 2016, which is engaged to manufacture crop protection products, seeds, fertilizers and others.

The Petrochemical business includes production of olefin petrochemicals, such as ethylene, propylene, butadiene from Naphtha, and aromatic petrochemicals such as benzene. It also includes production of synthetic resin and synthetic components from olefin, and aromatic petrochemicals. This business bears characteristics of a large-volume process industry. The Group's major products are PE, PP, BPA, ABS, EP, PVC, plasticizers, acrylic, SAP, synthetic rubber, a special resin, and others.

LG Energy Solution, Ltd. which was established through the split-off of Energy solution business from the Parent Company on December 1, 2020, and its subsidiaries mainly manufacture and supply batteries ranging from IT & New application batteries for mobile phones and laptop computers, to automotive batteries for electric vehicles and ESS (Energy Storage System) batteries. Demand of small-sized batteries for new applications such as electric tools and electric driving devices as well as traditional IT devices is increasing recently and the automotive battery business is also expected to expand rapidly due to an increasing demand of the batteries in associated with enhanced environment regulation in developed countries. Demand for ESS is expanding with an increasing importance of efficient usage of electricity and generation of renewable energy.

The Advanced material business manufactures and supplies various kinds of IT materials such as polarizer, automotive material, OLED film, semiconductor materials,OLED materials, battery materials and others and RO membranes, which will be the next growth engine for future.

The Life Sciences business manufactures and supplies pharmaceutical products, such as human growth hormone 'Eutropin', diabetes drug 'Zemiglo', bovine somatotropin 'Boostin', hyaluronic acid filler 'YVOIRE' and others, as well as fine chemical products, such as herbicide 'PYANCHOR' for rice farming and others.

FarmHannong Co., Ltd. and its subsidiaries which were acquired by the Group in 2016 to manufacture and sell crop protection products, seeds, fertilizers and others. The crop protection business provides high value products such as environmentally-friendly pesticide. The fertilizer business leads developing a next generation fertilizers such as eco-friendly organic and functional fertilizers, and potting soil. The seed business puts priority on retaining various genetic resources and developing rare breeds with high profit in order to remain competitive in a future food industry.

1.3 Consolidated Subsidiaries, Associates and Joint Ventures

	December 31, 2021			
	Percentage of ownership (%)	Business location	Closing month	Business activities
Consolidated subsidiaries				
LG Energy Solution, Ltd.[1]	100	Korea	December	Battery manufacturing and sales
Ningbo LG Yongxing Chemical Co., Ltd.[2]	75	China	December	ABS/SBL manufacturing and sales
Ningbo Zhenhai LG Yongxing Trade Co., Ltd.[2]	75	China	December	ABS sales
LG Chem America, Inc	100	USA	December	Sales and trading
LG Chemical India Pvt. Ltd.[3]	100	India	December	Synthetic resin manufacturing and sales
LG Polymers India Pvt. Ltd.[3]	100	India	December	PS manufacturing and sales
LG Chemical (Guangzhou) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem (Taiwan), Ltd.	100	Taiwan	December	Polarizer manufacturing and sales
Tianjin LG Bohai Chemical Co., Ltd.	75	China	December	PVC, VCM, EDC manufacturing and sales
Tianjin LG BOTIAN Chemical Co., Ltd.	58	China	December	SBS manufacturing and sales
LG Chem (China) Investment Co., Ltd.	100	China	December	China holding company
LG Chem (Tianjin) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem Europe GmbH	100	Germany	December	Sales and trading
LG Chem Poland Sp. z o.o.	100	Poland	December	EP manufacturing and sales
LGC Petrochemical India Private Ltd.	100	India	December	Synthetic resin manufacturing and sales
HAENGBOKNURI CO., LTD.	100	Korea	December	Facility management and general cleaning
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	100	Turkey	December	Sales and trading
LG Chem Japan Co., Ltd.	100	Japan	December	Sales and trading
LG NanoH2O, LLC	100	USA	December	Water processing membrane sales
LG Chem (Chongqing) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	70	China	December	ABS manufacturing and sales
LG Chem Life Sciences India Pvt. Ltd.	100	India	December	Pharmaceutical products sales
LG Jiansheng Life Sciences (Beijing) Co., Ltd.[5]	60	China	December	Pharmaceutical products sales
LG Chem Life Sciences (Thailand) Ltd.	100	Thailand	December	Pharmaceutical products sales
LG Chem Hai Phong Engineering Plastics LLC.	100	Vietnam	December	Polarizer manufacturing and sales
LG Chem Mexico S.A. de C.V.	100	Mexico	December	Sales and trading
LG Chem Hai Phong engineering Plastics LLC.	100	Vietnam	December	EP manufacturing and sales
LG Chem (Guangzhou) Information & Electronics Materials Co., Ltd.	100	China	December	Polarizer manufacturing and sales
LEYOU NEW ENERGY MATERIALS(WUXI) Co., LTD.[8]	51	China	December	Battery materials manufacturing and sales
LG Chem Fund I LLC[6]	100	USA	December	Investments in venture companies
Uniseal,Inc.	100	USA	December	Adhesive manufacturing and sales
LG Chem Life Science Innovation Center, Inc.	100	USA	December	Pharmaceutical products research
LG Chem Asia Pte. Ltd.[7]	100	Singapore	December	Asia BSC
LG Chem China Tech Center [4]	100	China	December	Petrochemical research
Shanjin Optoelectronics (Taiwan) Co., Ltd. [8]	100	Taiwan	December	Others

LG PETRONAS CHEMICALS Malaysia Sdn. Bhd. [9]	51	Malaysia	December	NBL manufacturing and sales
LG Hangzhou Advanced Materials Co., Ltd. [10]	70	China	December	EP manufacturing and sales
LG BCM [11]	100	Korea	December	EP manufacturing and sales
LG Chem Ohio Petrochemical, Inc.[12]	100	USA	December	ABS manufacturing and sales
FarmHannong Co., Ltd.[13]	100	Korea	December	Agricultural pesticide manufacturing and sales
Farmhannong America, Inc.[13]	100	USA	December	Agricultural pesticide sales
FarmHannong(Thailand) Ltd.[13]	100	Thailand	December	Research and development on seeds
FARMHANNONG(MALAYSIA) SDN. BHD.[13]	100	Malaysia	December	Agricultural pesticide licensing
PT FARM HANNONG INDONESIA[7,13]	100	Indonesia	December	Agricultural pesticide licensing
FarmHannong do Brasil Limitada[13]	100	Brazil	December	Agricultural pesticide sales
LG Energy Solution (Nanjing) Co., Ltd.[1]	100	China	December	Battery manufacturing and sales
LG Energy Solution Michigan Inc[1]	100	USA	December	Automotive battery research and manufacturing
LG Energy Solution Battery (Nanjing) Co., Ltd.[1]	100	China	December	Automotive battery manufacturing and sales
LG Energy Solution Wroclaw sp. z o.o.[1]	100	Poland	December	Automotive battery manufacturing and sales
LG Energy Solution Australia Pty Ltd [1]	100	Australia	December	Energy saving battery sales
LG Energy Solution Technology (Nanjing) Co., Ltd. [1]	100	China	December	Battery manufacturing and sales
Ultium Cells LLC [1, 16]	50	USA	December	Automotive battery manufacturing and sales
LG Energy Solution Europe GmbH [1]	100	Germany	December	Sales and trading
LG Energy Solution (Taiwan), Ltd. [1]	100	Taiwan	December	Sales and trading
Aremnuri. Co. Ltd [1]	100	Korea	December	Facility management and general cleaning
LG Energy Solution Fund I LLC [1]	100	USA	December	Investments in venture companies
Associates				
TECHWIN Co., Ltd.	20	Korea	December	Environment solution and construction of chemical plant
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.[15]	100	Brazil	December	Sales and trading
LG Chem Malaysia SDN.BHD.[15]	100	Malaysia	December	Sales and trading
LG Chem Life Sciences Poland Ltd.[15]	100	Poland	December	Pharmaceutical products sales
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.[16]	49	China	December	Battery materials manufacturing and sales
TL Chemical CO., Ltd [17]	40	Korea	December	AN manufacturing and sales
VINFAST LITHIUM BATTERY PACK LLC. [1]	35	Vietnam	December	Battery manufacturing and sales
Jiangxi VL Battery., Ltd. [1]	34	China	December	Battery manufacturing and sales
Joint ventures				
VINA Plasticizers Chemical Co.,Ltd.[18]	50	Vietnam	December	DOP production and sales
SEETEC Co., Ltd.	50	Korea	December	Plant utility and distribution, research assistance service
PT.HLI Greenpower Co., Ltd. [1, 14, 19]	50	Indonesia	December	Automotive battery manufacturing and sales

[1] These are subsidiaries, associates, and joint venture of LG Energy Solution, Ltd. As at December 31, 2021, the Parent Company owns 100% of LG Energy Solution, Ltd.'s shares.
[2] As at December 31, 2021, Ningbo LG Yongxing Chemical Co., Ltd. owns 100% of Ningbo Zhenhai LG Yongxing Trading Co., Ltd.'s shares.
[3] As at December 31, 2021, LG Chemical India Pvt. Ltd. owns 100% of LG Polymers India Pvt. Ltd.'s shares.
[4] As at December 31, 2021, LG Chem (China) Investment Co., Ltd. owns 100% of LG Chem China Tech Center's shares. LG Chem China Tech Center was newly established during the year ended December 31, 2021, and the Group newly acquired 100% shares of LG Chem China Tech Center for ₩32,311 million.

[5] During the year ended December 31, 2021, the Parent Company additionally acquired shares of LG Jiansheng Life Sciences (Beijing) Co., Ltd. for ₩2,257 million. The entity name of LG Jiansheng Life Sciences (Beijing) Co., Ltd. has been changed from LG Chem Life Sciences (Beijing) Co., Ltd. and the percentage of ownership of the Parent Company has decreased to 60%.
[6] During the year ended December 31, 2021, the Parent Company additionally acquired shares of LG CHEM FUND I LLC for ₩11,253 million.
[7] LG Chem Asia Pte. Ltd. was newly established during the year ended December 31, 2021, and the Parent Company acquired 100% shares of LG Chem Asia Pte. Ltd. for ₩821 million.
[8] Shanjin Optoelectronics (Taiwan) Co., Ltd. was newly established during the year ended December 31, 2021, and the Parent Company acquired 100% shares of Shanjin Optoelectronics (Taiwan) Co., Ltd. for ₩55,297 million.
[9] LG PETRONAS CHEMICALS Malaysia Sdn.Bhd. was newly established during the year ended December 31, 2021, and the Parent Company acquired 51% shares of LG PETRONAS CHEMICALS Malaysia Sdn.Bhd. for ₩36,867 million.
[10] During the year ended December 31, 2021, the Parent Company newly acquired 70% shares of LG Chem Hangzhou Advanced Materials Co., Ltd. for ₩67,027 million.
[11] LG BCM was newly established during the year ended December 31, 2021, and the Parent Company acquired 100% shares of LG BCM for ₩53,504 million.
[12] LG Chem Ohio Petrochemical, Inc. was newly established during the year ended December 31, 2021, and the Parent Company acquired 100% shares of LG BCM for ₩22,516 million.
[13] As at December 31, 2021, FarmHannong Co., Ltd. owns 100% ownership in Farmhannong America, Inc., FarmHannong(Thailand) Ltd., FARMHANNONG(MALAYSIA) SDN.BHD., PT FARM HANNONG INDONESIA and FarmHannong do Brasil Limitada.
[14] PT.HKML Battery Indonesia was newly established in accordance with a joint arrangement in which the Group participated during the year ended December 31, 2021. This investment is classified as a joint venture since the joint arrangement is structured through a separate vehicle and the Group has rights to the net assets of the arrangement.
[15] Classified as an investment in associate due to its small size.
[16] The Group possesses control over Ultium Cells LLC as the Group can exercise the majority voting rights in its decision-making process and has the ability to use power to affect the returns of the investee through its involvement in the production and cost management and other activities in accordance with the shareholders' agreement.
[17] TL Chemical CO., Ltd. was newly established during the year ended December 31, 2021, and the Parent Company acquired 40% shares of TL Chemical CO., Ltd. for ₩48,544 million.
[18] LG VINA Chemical Co.,Ltd. changed it name to VINA Plasticizers Chemical Co., Ltd. during the year ended December 31, 2021.
[19] HKML Battery Indonesia changed it name to PT.HLI Green Power. during the year ended December 31, 2021.

1.4 Summarized Financial Information of Subsidiaries, Associates and Joint Ventures

Summarized financial information (before elimination of intercompany transactions and adjustments for differences in accounting policies) of subsidiaries, associates and joint ventures is as follows:

(in millions of Korean won)	December 31, 2021			2021	
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the period
Subsidiaries					
LG Energy Solution, Ltd.[1,2]	23,764,139	15,021,765	8,742,374	17,851,906	929,868
Ningbo LG Yongxing Chemical Co.,Ltd.	1,394,894	258,879	1,136,015	2,554,653	522,512
Ningbo Zhenhai LG Yongxing Trade Co.,Ltd.	6,787	735	6,052	26,411	536
LG Chem America, Inc.	408,469	366,034	42,435	1,022,813	8,780
LG Chemical India Pvt. Ltd.	32,799	35	32,764	-	16
LG Polymers India Pvt. Ltd.	44,118	36,206	7,912	12,966	(9,182)

LG Chemical (Guangzhou) Engineering Plastics Co.,Ltd.	119,231	42,590	76,641	273,693	7,344
LG Chem (Taiwan), Ltd.	109,772	35,905	73,867	108,308	1,761
LG Chem Display Materials (Beijing) Co.,Ltd.[2]	-	-	-	-	276
Tianjin LG Bohai Chemical Co.,Ltd.	530,055	127,935	402,120	679,667	144,004
Tianjin LG BOTIAN Chemical Co.,Ltd.	46,289	19,597	26,692	132,087	1,387
LG Chem (China) Investment Co.,Ltd.	1,371,751	679,206	692,545	66,547	167,628
LG Chem (Tianjin) Engineering Plastics Co.,Ltd.	56,898	12,011	44,887	82,162	1,462
LG Chem Europe GmbH	358,459	288,909	69,550	671,000	11,127
LG Chem Poland Sp. z o.o.	222,263	133,527	88,736	175,045	20,748
LGC Petrochemical India Private Ltd.	4,918	988	3,930	4,596	556
HAENGBOKNURI CO., LTD.	4,503	1,385	3,118	9,146	703
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	10,416	10,685	(269)	44,209	(1,296)
LG Chem Japan Co.,Ltd.	5,109	1,391	3,718	6,063	(1,207)
LG NanoH2O, LLC[3]	44,449	14,978	29,471	57,106	5,274
LG Chem (Chongqing) Engineering Plastics Co.,Ltd.	49,879	15,955	33,924	83,530	2,852
LG Chem (HUIZHOU) Petrochemical Co., Ltd.	574,744	155,233	419,511	1,056,809	194,111
LG Chem Life Sciences India Pvt. Ltd.	3,191	2,242	949	5,802	443
LG Jiansheng Life Sciences (Beijing) Co., Ltd.	11,742	6,854	4,888	7,536	(1,462)
LG Chem Life Sciences (Thailand) Ltd.	25,708	10,875	14,833	38,141	2,004
LG Chem Hai Phong Vietnam Company Ltd.	14,571	4,458	10,113	25,833	1,750
LG Chem Mexico S.A. de C.V.	1,619	267	1,352	2,191	329
LG Chem Hai Phong Engineering Plastics Ltd.	31,476	15,698	15,778	35,442	2,744
LG Chem (Guangzhou) Information & Electronics Materials Co.,Ltd.[2]	317,592	109,131	208,461	176,337	(12,007)
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD.	608,961	172,607	436,354	655,602	62,083
LG Chem Fund I LLC	45,922	9	45,913	-	(2,084)
Ugimag Korea Co., Ltd.[2]	-	-	-	11,512	(3,838)
Uniseal,Inc.[3]	38,635	6,932	31,703	66,388	217
LG Chem Life Science Innovation Center, Inc.	3,446	1,153	2,293	5,303	703
LG Chem Asia Pte. Ltd.	2,927	2,079	848	1,932	(27)
LG Chem China Tech Center	34,327	390	33,937	647	189
Shanjin Optoelectronics (Taiwan) Co., Ltd.	59,149	5	59,144	-	30
LG PETRONAS CHEMICALS Malaysia Sdn.Bhd.	123,502	50,961	72,541	-	(2,762)
LG Chem Hangzhou Advanced Materials Co., Ltd.	112,892	78,981	33,911	45,440	1,736
LG BCM	54,412	1,599	52,813	-	(435)
LG Chem Ohio Petrochemical, Inc.	24,132	1,578	22,554	-	-
FarmHannong Co., Ltd.[1,3]	1,047,277	657,687	389,590	671,460	14,282
Associates					
TECHWIN Co., Ltd.	142,066	51,893	90,173	78,907	568
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR Q UIMICO LTDA.	729	91	638	1,659	182
LG Chem Malaysia SDN.BHD.	525	2	523	687	82
LG Chem Life Sciences Poland Ltd.	188	70	118	183	5
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	422,366	229,745	192,621	157,173	(10,180)
TL Chemical CO., Ltd.	121,551	369	121,182	-	(178)
VINFAST LITHIUM BATTERY PACK LLC.	17,496	6,295	11,201	13,590	(1,570)
Jiangxi VL Battery.,Ltd.	76,495	16,799	59,696	17,836	(10,245)
Joint ventures					
VINA Plasticizers Chemical Co.,Ltd.	64,237	39,721	24,516	185,736	15,460
SEETEC Co., Ltd.	328,396	52,384	276,012	569,215	9,454
PT.HLI Green Power	404,131	1,156	402,975	-	(18,402)

[1] LCD polarizer business of these entities was classified as discontinued operations and profit or loss from the business was included in profit from discontinued operations(Note 34).
[2] Fair value adjustments due to business combination recorded in the consolidated financial statements are not included in the above information.
[3] Represent financial information of intermediate parent company consolidating its subsidiaries.

(in millions of Korean won)	December 31, 2020			2020	
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the year
Subsidiaries					
LG Energy Solution, Ltd.	12,342,717	5,090,619	7,252,098	632,954	(377,980)
Ningbo LG Yongxing Chemical Co.,Ltd.	1,092,905	219,173	873,732	1,718,744	363,954
Ningbo Zhenhai LG Yongxing Trade Co.,Ltd.	6,224	1,303	4,921	21,144	413
LG Chem America, Inc.	237,946	208,031	29,915	683,181	5,641
LG Chemical India Pvt. Ltd.	32,680	19	32,661	-	29
LG Polymers India Pvt. Ltd.	56,029	38,833	17,196	61,709	(62,422)
LG Chemical (Guangzhou) Engineering Plastics Co.,Ltd.	107,270	33,741	73,529	202,417	15,097
LG Chem (Nanjing) Information & Electronics Materials Co.,Ltd.[1]	3,793,936	1,536,320	2,257,616	3,187,317	351,732
LG Chem (Taiwan), Ltd.	113,717	46,372	67,345	127,861	2,693
LG Chem Display Materials (Beijing) Co.,Ltd.[1]	40,417	13,171	27,246	167	1,406
Tianjin LG Bohai Chemical Co.,Ltd.	282,683	53,113	229,570	484,912	67,720
Tianjin LG BOTIAN Chemical Co.,Ltd.	38,391	14,760	23,631	107,588	8,991
LG Chem (China) Investment Co.,Ltd.	703,145	392,501	310,644	61,415	77,465
LG Chem (Tianjin) Engineering Plastics Co.,Ltd.	52,446	10,440	42,006	60,210	3,923
LG Chem Europe GmbH	229,078	166,779	62,299	656,984	16,461
LG Chem Poland Sp. z o.o.	74,063	27,931	46,132	110,923	10,237
LG Energy Solution Michigan Inc.	915,288	607,065	308,223	727,897	(121,895)
LGC Petrochemical India Private Ltd.	3,722	590	3,132	3,721	362
HAENGBOKNURI CO., LTD.	4,869	2,453	2,416	11,562	537
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	7,033	6,154	879	44,961	55
LG Chem Japan Co.,Ltd.	5,863	852	5,011	5,730	573
LG NanoH2O, LLC[2]	33,155	11,117	22,038	40,871	5,033
Nanjing LG Chem New Energy Battery Co.,Ltd.	1,059,066	781,217	277,849	1,237,064	63,336
LG Chem (Chongqing) Engineering Plastics Co.,Ltd.	38,629	10,973	27,656	49,391	5,067
LG Chem Wroclaw Energy sp. z o.o.	6,526,231	5,350,936	1,175,295	5,119,379	(302,248)
LG Chem (HUIZHOU) Petrochemical Co., Ltd.	392,176	199,465	192,711	700,735	118,374
FarmHannong Co., Ltd.[2,3]	1,023,232	646,884	376,348	601,679	7,940
LG Chem Life Sciences India Pvt. Ltd.	1,295	837	458	5,176	1,027
LG Chem Life Sciences (Beijing) Co.,Ltd.	2,099	716	1,383	1,856	82
LG Chem Life Sciences (Thailand) Ltd.	22,854	9,722	13,132	33,434	2,752
LG Chem Hai Phong Vietnam Company Ltd.	14,277	6,770	7,507	16,881	1,264
LG Energy Solution Austrailia Pty Ltd.	4,793	3,049	1,744	9,398	565
LG Chem Mexico S.A. de C.V.	1,081	152	929	1,362	214
LG Chem Hai Phong Engineering Plastics Ltd.	23,110	11,430	11,680	16,148	(1,395)
LG Chem (Guangzhou) Information & Electronics Materials Co.,Ltd.[1]	630,513	399,728	230,785	49,440	62,871
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD.	429,359	97,122	332,237	50,174	1,874
LG Chem Fund I LLC	28,842	31	28,811	-	(4,109)
Ugimag Korea Co., Ltd.[2]	39,015	15,903	23,112	17,638	(7,905)
Uniseal,Inc.[2,3]	34,452	6,050	28,402	57,725	757

LG Chem Nanjing Energy Solution Co., Ltd.	1,767,706	964,689	803,017	837,968	42,555
LG Chem Life Science Innovation Center, Inc.	3,314	1,868	1,446	4,500	263
Ultium Cells LLC	336,851	32,309	304,542	-	11
LG Energy Solution Europe GmbH	49,626	14,814	34,812	9,855	130
Associates					
TECHWIN Co., Ltd.	134,405	38,746	95,659	112,184	11,049
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	528	80	448	1,423	252
LG Chem Malaysia SDN.BHD.	418	2	416	677	28
FJ Composite Material Co., Ltd.	11,026	4,635	6,391	1,867	302
WUXI CL New Energy Technology Ltd.	1,910	2,972	(1,062)	1,065	(34)
LG Chem Life Sciences Poland Ltd.	191	78	113	256	11
Combustion Synthesis Co., Ltd.	717	66	651	105	(488)
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	226,471	43,454	183,017	-	565
VINFAST LITHIUM BATTERY PACK LLC.	18,148	6,322	11,826	19,555	(1,342)
Jiangxi VL Battery.,Ltd.	67,186	4,066	63,120	-	208
Joint ventures					
LG VINA Chemical Co., Ltd.	35,832	27,515	8,317	91,304	2,237
HL Greenpower Co., Ltd.	406,928	360,547	46,381	1,255,431	(591)
SEETEC Co., Ltd.	342,227	55,056	287,171	490,978	14,556

[1] LCD polarizer business of these entities was classified as discontinued operations and profit or loss from the business was included in profit from discontinued operations(Note 34).
[2] Fair value adjustments due to business combination recorded in the consolidated financial statements are not included in the above information.
[3] Represent financial information of intermediate parent company consolidating its subsidiaries.

1.5 Information of Non-Controlling Interests that are Material to the Group

(a) Ultium Cells LLC

- Percentage of ownership held by non-controlling interests and accumulated non-controlling interests

(in millions of Korean won)	**2021**	**2020**
Percentage of ownership held by non-controlling interests	50.0%	50.0%
Accumulated non-controlling interests	776,257	152,271

- Profit and dividends attributable to non-controlling interests for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	**2021**
Profit allocated to non-controlling interests	141
Dividends paid to non-controlling interests	-

Summarized consolidated statements of financial positions of subsidiaries with material non-controlling interests, are as follows (before elimination of intercompany transaction):

(in millions of Korean won)	**2021**	**2020**
Current assets	472,813	87,883
Non-current assets	1,267,920	248,968
Total assets	1,740,733	336,851
Current liabilities	188,200	32,309
Non-current liabilities	21	-
Total liabilities	188,221	32,309
Total equity	1,552,512	304,542

Summarized consolidated statements of comprehensive income of subsidiaries with material non-controlling interests for the year ended December 31, 2021, are as follows (before elimination of intercompany transaction):

(in millions of Korean won)	**2021**
Revenue	-
Profit for the year	282
Total comprehensive income	69,848

Summarized consolidated statements of cash flows of subsidiaries with material non-controlling interests for the year ended December 31, 2021, are as follows (before elimination of intercompany transaction):

(in millions of Korean won)	**2021**
Cash flows from operating activities	(18,751)
Cash flows from investing activities	(803,651)
Cash flows from financing activities	1,177,783
Effects of exchange rate changes on cash and cash equivalents	28,230
Net increase in cash and cash equivalents	383,611
Cash and cash equivalents at beginning of year	87,883
Cash and cash equivalents at end of year	471,494

1.6 Changes in Scope for Consolidation

Subsidiaries newly included in the consolidation for the year ended December 31, 2021, are as follows:

Subsidiary	Reason
LG Chem Asia Pte. Ltd.	Newly established
LG Chem China Tech Center	Newly established
Shanjin Optoelectronics (Taiwan) Co., Ltd.	Newly established
LG Energy Solution (Taiwan), Ltd.	Newly established
Aremnuri. Co. Ltd	Newly established
LG PETRONAS CHEMICALS Malaysia Sdn.Bhd.	Newly established
LG Energy Solution Fund I LLC	Newly established
LG Chem Hangzhou Advanced Materials Co., Ltd.	Newly acquired
LG BCM	Newly established
LG Chem Ohio Petrochemical, Inc.	Newly established
FarmHannong do Brasil Limitada	Newly established

Subsidiary excluded from the consolidation for the year ended December 31, 2021, is as follows:

Subsidiary	Reason
LG Chem Display Materials (Beijing) Co.,Ltd.	Disposed
Uniseal Europe Ltd.	Liquidated
Ugimag Korea Co., Ltd.	Disposed

2. Summary of Significant Accounting Policies

The principal accounting policies applied in the preparation of these consolidated financial statements are set out below. These policies have been consistently applied to all the years presented, unless otherwise stated.

2.1 Basis of Preparation

The Group maintains its accounting records in Korean won and prepares statutory financial statements in the Korean language (Hangul) in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (Korean IFRS). The accompanying consolidated financial statements have been condensed, restructured and translated into English from the Korean language financial statements.

Certain information attached to the Korean language financial statements, but not required for a fair presentation of the Group's financial position, financial performance or cash flows, is not presented in the accompanying consolidated financial statements.

The consolidated financial statements of the Group have been prepared in accordance with Korean IFRS. These are the standards, subsequent amendments and related interpretations issued by the International Accounting Standards Board (IASB) that have been adopted by the Republic of Korea.

The financial statements have been prepared on a historical cost basis, except for the following:

- Certain financial assets and liabilities (including derivative instruments),

- Assets held for sale – measured at fair value less costs to sell, and

- Defined benefit pension plans – plan assets measured at fair value

The preparation of financial statements requires the use of critical accounting estimates. Management also needs to exercise judgement in applying the Group's accounting policies. The areas involving a higher degree of judgment or complexity, or areas where assumptions and estimates are significant to the consolidated financial statements are disclosed in Note 4.

2.2 Changes in Accounting Policies and Disclosures

(a) New and amended standard adopted by the Group

The Group has applied the following standards and amendments for the first time for their annual reporting period commencing January 1, 2021.

- Amendments to Korean IFRS 1116 Lease – Practical expedient for COVID-19 - Related Rent Concessions

As a practical expedient, a lessee may elect not to assess whether a rent concession occurring as a direct consequence of the COVID-19 pandemic is a lease modification. A lessee that makes this election shall account for any change in lease payments resulting from the rent concession the same way it would account for the change applying this Standard if the change were not a lease modification. The amendment does not have a significant impact on the financial statements.

- Amendments to Korean IFRS 1109 Financial Instruments, Korean IFRS 1039 Financial Instruments: Recognition and Measurement, Korean IFRS 1107 Financial Instruments: Disclosure, Korean IFRS 1104 Insurance Contracts and Korean IFRS 1116 Lease – Interest Rate Benchmark Reform (Phase 2 amendments)

In relation to interest rate benchmark reform, the amendments provide exceptions including adjusting effective interest rate instead of book amounts when interest rate benchmark of financial instruments at amortized costs is replaced, and applying hedge accounting without discontinuance although the interest rate benchmark is replaced in hedging relationship. The amendment does not have a significant impact on the financial statements.

(b) New and amended standards not yet adopted by the Group

The following new and amended accounting standards have been published that are not mandatory for December 31, 2021 reporting periods and have not been early adopted by the Group.

- Amendment to Korean IFRS 1116 - Covid-19 - Related Rent Concessions beyond June 30, 2021

The application of the practical expedient, whereby a lessee may elect not to assess whether a rent concession occurring as a direct consequence of the COVID-19 pandemic is a lease modification, is extended to lease payments originally due on or before June 30, 2022. The amendment should be applied for annual periods beginning on or after April 1, 2021, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Amendments to Korean IFRS 1103 Business Combination – Reference to the Conceptual Framework

The amendments update a reference of definition of assets and liabilities to be recognized in a

business combination in revised Conceptual Framework for Financial Reporting. However, the amendments add an exception for the recognition of liabilities and contingent liabilities within the scope of Korea IFRS 1037 *Provisions, Contingent Liabilities and Contingent Assets*, and Korean IFRS 2121 *Levies*. The amendments also clarify that contingent assets should not be recognized at the acquisition date. The amendments should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Amendments *to Korean IFRS 1016 Property, Plant and Equipment - Proceeds before intended use*

The amendments prohibit an entity from deducting from the cost of an item of property, plant and equipment any proceeds from selling items produced while the entity is preparing the asset for its intended use. Instead, the entity will recognize the proceeds from selling such items, and the costs of producing those items, in profit or loss. The amendments should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group is in review for the impact of these amendments on the financial statements.

- Amendments to Korean IFRS 1037 Provisions, Contingent Liabilities and Contingent Assets - Onerous Contracts: Cost of Fulfilling a Contract

The amendments clarify that the direct costs of fulfilling a contract include both the incremental costs of fulfilling the contract and an allocation of other costs directly related to fulfilling contracts when assessing whether the contract is onerous. The amendments should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Amendments to Korean IFRS 1001 Presentation of Financial Statements - Classification of Liabilities *as Current or Non-current*

The amendments clarify that liabilities are classified as either current or non-current, depending on the substantive rights that exist at the end of the reporting period. Classification is unaffected by the likelihood that an entity will exercise right to defer settlement of the liability or the management's expectation. Also, the settlement of liability includes the transfer of the entity's own equity instruments, however, it would be excluded if an option to settle them by the entity's own equity instruments if compound financial instruments meeet the definition of equity instruments and recognized separately from the liability. The amendments should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted. The Group is in review for the impact of these amendments on the financial statements.

- Korean IFRS 1001 Presentation of Financial Statements - Disclosure of Accounting Policies

The amendments to Korean IFRS 1001 define and require entities to disclose their material accounting policies. The IASB amended IFRS Practice Statement 2 *Disclosure of Accounting Policies* to provide guidance on how to apply the concept of materiality to accounting policy disclosures. The amendments should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted. The Group is in review for the impact of these amendments on the financial statements.

- Korean IFRS 1008 Accounting policies, changes in accounting estimates and errors - Definition of Accounting Estimates

The amendments define accounting estimates and clarify how to distinguish them from changes in accounting policies. The amendments should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Korean IFRS 1012 *Income Taxes - Deferred Tax related to Assets and Liabilities arising from a Single Transaction*

The amendments introduce an exception to the initial recognition exemption. Applying this exception, an entity does not apply the initial recognition exemption for transactions that give rise to equal taxable and deductible temporary differences. The amendments should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Annual improvements to Korean IFRS 2018-2020

Annual improvements of Korean IFRS 2018-2020 should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Korean IFRS 1101 *First time Adoption of Korean International Financial Reporting Standards* – Subsidiaries that are first-time adopters

- Korean IFRS 1109 *Financial Instruments* – Fees related to the 10% test for derecognition of financial liabilities

- Korean IFRS 1116 *Leases* – Lease incentives

- Korean IFRS 1041 *Agriculture* – Measuring fair value

2.3 Consolidation

The Group has prepared the consolidated financial statements in accordance with Korean IFRS 1110 *Consolidated Financial Statements*.

(a) Subsidiaries

Subsidiaries are all entities over which the Group has control. The Group controls an entity when the Group is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power to direct the activities of the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the Group. They are deconsolidated from the date that control ceases.

The acquisition method of accounting is used to account for business combinations by the Group. The consideration transferred is measured at the fair values of the assets transferred, and identifiable assets acquired and liabilities and contingent liabilities assumed in a business combination are measured initially at their fair values at the acquisition date. The Group recognizes any non-controlling interest in the acquired entity on an acquisition-by-acquisition basis either at fair value or at the non-controlling interest's proportionate share of the acquired entity's net identifiable assets. All other non-controlling interests are measured at fair values, unless otherwise required by other standards. Acquisition-related costs are expensed as incurred.

The excess of consideration transferred, amount of any non-controlling interest in the acquired entity and acquisition-date fair value of any previous equity interest in the acquired entity over the fair value of the net identifiable assets acquired is recoded as goodwill. If those amounts are less than the fair value of the net identifiable assets of the business acquired, the difference is

recognized directly in the profit or loss as a bargain purchase.
Intercompany transactions, balances and unrealized gains on transactions between group companies are eliminated. If a member of the Group uses accounting policies other than those adopted in the consolidated financial statements for like transactions and events in similar circumstances, appropriate adjustments are made to that group member's financial statements in preparing the consolidated financial statements to ensure conformity with the group's accounting policies.

For transactions with non-controlling interests that do not result in a loss of control, any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received is recognized in equity attributable to the owners of the Parent.

When the Group loses a control in a subsidiary, any retained interest in the subsidiary is remeasured at its fair value and resulting gain or loss is recognized in profit or loss.

(b) Associates

Associates are entities over which the Group has significant influence but not control or joint control. Investments in associates are accounted for using the equity method of accounting, after initially being recognized at cost. Unrealized gains on transactions between the Group and its associates are eliminated to the extent of the Group's interest in the associates. If the Group's share of losses of an associate equals or exceeds its interest in the associate (including long-term interests that, in substance, form part of the Group's net investment in the associate), the Group discontinues recognizing its share of further losses. After the Group's interest is reduced to zero, additional losses are provided for, and a liability is recognized, only to the extent that the Group has incurred legal or constructive obligations or made payments on behalf of the associate. If there is objective evidence of impairment for the investment in the associate, the Group recognizes the difference between the recoverable amount of the associate and its book amount as impairment loss. If an associate uses accounting policies other than those of the Group for like transactions and events in similar circumstances, if necessary, adjustments shall be made to make the associate's accounting policies conform to those of the Group when the associate's financial statements are used by the Group in applying the equity method.

(c) Joint Arrangements

A joint arrangement, wherein two or more parties have joint control, is classified as either a joint operation or a joint venture. A joint operator recognizes its direct right to the assets, liabilities, revenues and expenses of joint operations and its share of any jointly held or incurred assets, liabilities, revenues and expenses. Interests in joint ventures are accounted for using the equity method, after initially being recognized at cost in the consolidated statement of financial position.

2.4 Foreign Currency Translation

(a) Functional and presentation currency

Items included in the financial statements are measured using the currency of the primary economic environment in which each entity operates (the "functional currency"). The consolidated financial statements are presented in Korean won, which is the Parent Company's functional and presentation currency.

(b) Transactions and balances

Foreign currency transactions are translated into the functional currency using the exchange rates

at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation of monetary assets and liabilities denominated in foreign currencies at year end exchange rates are generally recognized in profit or loss. They are recognized in other comprehensive income if they relate to qualifying cash flow hedges, qualifying effective portion of net investment hedges, or are attributable to monetary part of the net investment in a foreign operation.

Foreign exchange gains and losses that relate to borrowings are presented in the statement of profit or loss, within finance costs. All other foreign exchange gains and losses are presented in the statement of profit or loss within 'other income or other expenses'.

Non-monetary items that are measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value was determined. Translation differences on assets and liabilities carried at fair value are reported as part of the fair value gain or loss. For example, translation differences on non-monetary assets and liabilities such as equities held at fair value through profit or loss are recognized in profit or loss as part of the fair value gain or loss and translation differences on non-monetary assets such as equities held at fair value through other comprehensive income are recognized in other comprehensive income.

(c) Translation into the presentation currency

The results and financial position of foreign operations that have a functional currency different from the presentation currency are translated into the presentation currency as follows:

i) assets and liabilities for each statement of financial position presented are translated at the closing rate at the end of the reporting period;
ii) income and expenses for each statement of income are translated at monthly average exchange rates; and
iii) equity is translated at the historical exchange rate; and
iv) all resulting exchange differences are recognized in other comprehensive income.

Goodwill and fair value adjustments to the carrying amounts of assets and liabilities arising on the acquisition of a foreign operation are treated as assets and liabilities of the foreign operation and translated at the closing rate at the end of the reporting period.

2.5 Cash and Cash Equivalents

Cash and cash equivalents include cash in hand, deposits held at call with banks, other short-term highly liquid investments with original maturities of three months or less.

2.6 Financial Assets

(a) Classification

The Group classifies its financial assets in the following measurement categories:
- those to be measured at fair value through profit or loss
- those to be measured at fair value through other comprehensive income, and
- those to be measured at amortized cost

Financial assets are classified on the basis of the Group's business model for managing the financial assets and the contractual cash flow characteristics of the financial assets.

Gains and losses on financial assets measured at fair value are recognized either in profit or loss or other comprehensive income. For investments in debt instruments, this will depend on the business model in which the investment is held. The Group reclassifies debt investments when, and only when its business model for managing those assets changes.

For investments in equity instruments that are not held for trading, this will depend on whether the Group may make an irrevocable election at the time of initial recognition to account for the equity investment at fair value through other comprehensive income. Changes in fair value of non-designated equity investment are recognized in profit or loss.

(b) Measurement

At initial recognition, the Group measures a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition of the financial asset. Transaction costs of financial assets carried at fair value through profit or loss are expensed in profit or loss. Financial assets with embedded derivatives are considered in their entirety when determining whether their cash flows are solely payment of principal and interest.

A. Debt instruments

Subsequent measurement of debt instruments depends on the Group's business model for managing the asset and the cash flow characteristics of the asset. The Group classifies its debt instruments into one of the following three measurement categories:

- Amortized cost:
  Assets that are held for collection of contractual cash flows where those cash flows represent solely payments of principal and interest are measured at amortized cost. A gain or loss on a debt investment that is subsequently measured at amortized cost and is not part of a hedging relationship is recognized in profit or loss when the asset is derecognized or impaired. Interest income from these financial assets is included in 'finance income' using the effective interest rate method.

- Fair value through other comprehensive income:
  Assets that are held for collection of contractual cash flows and for selling the financial assets, where the assets' cash flows represent solely payments of principal and interest, are measured at fair value through other comprehensive income. Movements in the carrying amount are taken through other comprehensive income, except for the recognition of impairment loss (reversal of impairment loss), interest income and foreign exchange gains and losses which are recognized in profit or loss. When the financial asset is derecognized, the cumulative gain or loss previously recognized in other comprehensive income is reclassified from equity to profit or loss. Interest income from these financial assets is included in 'finance income' using the effective interest rate method. Foreign exchange gains and losses are presented in 'finance income / costs or other non-operating income / expenses' and impairment losses are presented in 'other non-operating expenses'.

- Fair value through profit or loss:
  Assets that do not meet the criteria for amortized cost or fair value through other

comprehensive income are measured at fair value through profit or loss. A gain or loss on a debt investment that is subsequently measured at fair value through profit or loss and is not part of a hedging relationship is recognized in profit or loss and presented net in the statement of profit or loss within 'finance income / costs or other non-operating income / expenses' in the year in which it arises.

B. Equity instruments

The Group subsequently measures all equity investments at fair value. Where the Group's management has elected to present fair value gains and losses on equity investments in other comprehensive income, there is no subsequent reclassification of fair value gains and losses to profit or loss following the derecognition of the investment. Dividend income from such investments continue to be recognized in profit or loss as 'finance income' when the right to receive payments is established. Changes in the fair value of financial assets at fair value through profit or loss are recognized in 'finance income or finance costs' in the statement of profit or loss as applicable. Impairment loss (reversal of impairment loss) on equity investments measured at fair value through other comprehensive income are not reported separately from other changes in fair value.

(c) Impairment

The Group assesses on a forward looking basis the expected credit losses associated with its debt instruments carried at amortized cost and fair value through other comprehensive income. The impairment methodology applied depends on whether there has been a significant increase in credit risk. For trade receivables, the Group applies the simplified approach, which requires expected lifetime credit losses to be recognized from initial recognition of the receivables.

(d) Recognition and Derecognition

Regular way purchases and sales of financial assets are recognized or derecognized on trade-date, the date on which the Group commits to purchase or sell the asset. Financial assets are derecognized when the rights to receive cash flows from the financial assets have expired or have been transferred and the Group has transferred substantially all the risks and rewards of ownership.

If a transfer does not result in derecognition because the Group has retained substantially all the risks and rewards of ownership of the transferred asset, the Group continues to recognize the transferred asset in its entirety and recognizes a financial liability for the consideration received. The Group classified the financial liability as 'borrowings' in the statement of financial position.

2.7 Derivative Financial Instruments

Derivatives are initially recognized at fair value on the date a derivative contract is entered into and are subsequently remeasured to their fair value at the end of each reporting period. The accounting for subsequent changes in fair value depends on whether the derivative is designated as a hedging instrument, and if so, the nature of the item being hedged. The Group has hedge relationships and designates certain derivatives as either:

- hedges of the fair value of recognized assets or liabilities or a firm commitment (fair value hedges)
- hedges of a particular risk associated with the cash flows of recognized assets and liabilities and highly probable forecast transactions (cash flow hedges), or
- hedges of a net investment in a foreign operation (net investment hedges)

At inception of the hedge relationship, the Group documents the economic relationship between hedging instruments and hedged items including whether changes in the cash flows of the hedging instruments are expected to offset changes in the cash flows of hedged items.

The full fair value of a hedging derivative is classified as a non-current asset or liability when the remaining maturity of the hedged item is more than 12 months; it is classified as a current asset or liability when the remaining maturity of the hedged item is less than 12 months. A non-derivative financial asset and a non-derivative financial liability is classified as a current or non-current based on its expected maturity and its settlement, respectively.

Cash flow hedge
The effective portion of changes in the fair value of derivatives that are designated and qualify as cash flow hedges is recognized in the cash flow hedge reserve within equity, limited to the cumulative change in fair value (present value) of the hedged item (the present value of the cumulative change in the future expected cash flows of the hedged item) from the inception of the hedge. The ineffective portion is recognized in 'other non-operating income (expenses)'.

When option contracts are used to hedge forecast transactions, the Group designates only the intrinsic value of the option contract as the hedging instrument. Gains or losses relating to the effective portion of the change in intrinsic value of the option contracts are recognized in the cash flow hedge reserve within equity. The changes in the time value of the option contracts that relate to the hedged item ('aligned time value') are recognized within the costs of hedging in other comprehensive income within equity.

When forward contracts are used to hedge forecast transactions, the Group generally designates only the change in fair value of the forward contract related to the spot element as the hedging instrument. Gains or losses relating to the effective portion of the change in the spot element of the forward contracts are recognized in the cash flow hedge reserve within equity. The change in the forward element of the contract that relates to the hedged item is recognized within other comprehensive income within equity. In some cases, the Group may designate the full change in fair value of the forward contract (including forward points) as the hedging instrument. In such cases, the gains or losses relating to the effective portion of the change in fair value of the entire forward contract are recognized in the cash flow hedge reserve within equity.

Amounts accumulated in equity are reclassified in the periods when the hedged item affects profit or loss, as follows:
- Where the hedged item subsequently results in the recognition of a non-financial asset (such as inventory), both the deferred hedging gains and losses and the deferred time value of the option contracts or deferred forward points, if any, are included within the initial cost of the asset. The deferred amounts are ultimately recognized in profit or loss as the hedged item affects profit or loss (for example through cost of sales).

- The gain or loss relating to the effective portion of the interest rate swaps hedging variable rate borrowings is recognized in profit or loss within 'finance cost' at the same time as the interest expense on the hedged borrowings.

When a hedging instrument expires, or is sold, terminated, exercised, or when a hedge no longer meets the criteria for hedge accounting, any accumulated cash flow hedge reserve at that time remains in equity until the forecast transaction occurs, resulting in the recognition of a non-financial asset such as inventory. When the forecast transaction is no longer expected to occur, the cash flow hedge reserve and deferred costs of hedging that were reported in equity are immediately reclassified to profit or loss.

Changes in the fair value of any derivative instrument that does not qualify for hedge accounting are recognized immediately in profit or loss within 'other non-operating income (expenses)' or 'finance income (costs)' based on the nature of transactions.

2.8 Trade Receivables

At initial recognition, trade receivables are measured at the amount of unconditional consideration, unless the trade receivables contain a significant financing component. Trade receivables are subsequently measured at amortized cost using the effective interest method, less loss allowance.

2.9 Inventories

Inventories are stated at the lower of cost and net realizable value. Cost is determined using weighted average cost method, except for goods in transit which is determined using the specific identification method.

2.10 Assets Held for sale

Assets are classified as held for sale when their carrying amount will be recovered principally through a sale transaction rather than through continuing use and a sale is considered highly probable. The assets are measured at the lower amount between their carrying amount and the fair value less costs to sell.

2.11 Property, Plant and Equipment

Property, plant and equipment are stated at historical cost less accumulated depreciation and accumulated impairment losses. Historical cost includes expenditure that is directly attributable to the acquisition of the items.

Depreciation of all property, plant and equipment, except for land, is calculated using the straight-line method to allocate their cost or revalued amounts, net of their residual values, over their estimated useful lives as follows:

	Useful lives
Buildings	25 - 50 years
Structures	15 - 50 years
Machinery	4 - 15 years
Others	1 - 15 years

The assets' depreciation method, residual values and useful lives are reviewed, and adjusted if appropriate, at the end of each reporting period.

2.12 Investment Property

Investment property is property held to earn rentals or for capital appreciation or both. An investment property is measured initially at its cost. An investment property is measured after initial measurement at depreciated cost (less any accumulated impairment losses). The Group depreciates investment properties, except for land, using the straight-line method over their useful lives of 25 ~ 50 years.

2.13 Borrowing Costs

General and specific borrowing costs that are directly attributable to the acquisition, construction or production of a qualifying asset are capitalized during the period of time that is required to complete and prepare the asset for its intended use or sale. Investment income earned on the temporary investment of specific borrowings on qualifying assets is deducted from the borrowing costs eligible for capitalization. Other borrowing costs are expensed in the period in which they are incurred.

2.14 Government Grants

Grants from the government are recognized at their fair value where there is a reasonable assurance that the grant will be received and the Group will comply with all attached conditions. Government grants related to assets are presented in the statement of financial position by deducting the grant in arriving at the carrying amount of the asset, and government grants related to income are deferred and later deducted from the related expense.

2.15 Intangible Assets

The excess of consideration transferred and amount of acquisition-date fair value of any previous equity interest in the acquired entity over the fair value of the net identifiable assets acquired is recoded as goodwill. Goodwill is carried at its cost less accumulated impairment losses. Impairment losses on goodwill are not reversed.

Intangible assets, except for goodwill, are initially recognized at its historical cost and carried at its cost less accumulated amortization and accumulated impairment losses.

Development costs that are directly attributable to internally generated by the Group are recognized when the criteria; such as, technically feasible, generate probable future economic benefits and other, are met. Membership rights that have an indefinite useful life are not subject to amortization because there is no foreseeable limit to the period over which the assets are expected to be utilized. The Group amortizes intangible assets with a limited useful life using the straight-line method over the following periods:

	Useful lives
Development costs	3 - 15 years
Industrial property rights	5 - 15 years
Others	6 - 20 years

2.16 Research and Development

Costs associated with research are recognized as an expense as incurred. Costs that are identifiable, controllable and directly attributable to development projects are recognized as intangible asset when the following criteria are met:

- It is technically feasible to complete the development project so that it will be available for use;
- Management intends to complete the development project for its own use or selling;
- There is an ability to use or sell the development project;
- It can be demonstrated how the development project will generate probable future economic benefits;
- Adequate technical, financial resources and other resources to complete the development and to use or sell the development project are available; and

- The expenditure attributable to the development project during its development can be reliably measured.

Generally, internally generated development projects have the following stages; formulation and selection of a project, verification of idea and technology, development and testing, decision of commercialization, test of final application. Expenditures can be capitalized as intangible assets only after the decision of commercialization. Expenditures incurred in other stages are recognized as expenses on the research phase.

Internally generated development projects in the Life Sciences business have the following stages; formulation of potential candidates, preclinical research, clinical researches such as phase 1, 2 and 3 trials, approval of regulatory body and new product launch. Expenditures incurred from new drug development project are recognized as expensed on the research phase. However, expenditures incurred during clinical phase 1~3 trials from development projects for generic drugs or biosimilars are recognized as intangible assets depending on the nature of the products.

Expenditures incurred from technology license agreement with the third parties are recognized as intangible assets.

Development costs previously recognized as an expense are not recognized as an asset in a subsequent period. Capitalized development costs that are recognized as intangible assets are amortized using the straight-line method over their estimated useful lives when the assets are available for use and are tested for impairment.

2.17 Impairment of Non-financial Assets

Goodwill and intangible assets with indefinite useful life are tested annually for impairment, or more frequently if events or changes in circumstances indicate that they might be impaired. Other assets that are subject to amortization are tested for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognized for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs of disposal and value in use. Non-financial assets other than goodwill that suffered an impairment are reviewed for possible reversal of the impairment at the end of each reporting period.

2.18 Trade and Other Payables

These amounts represent liabilities for goods and services provided to the Group prior to the end of reporting period which are unpaid. Trade and other payables are presented as current liabilities, unless payment is not due within 12 months after the reporting period. They are recognized initially at their fair value and subsequently measured at amortized cost using the effective interest method.

2.19 Financial Liabilities

(a) Classification and measurement

The Group's financial liabilities at fair value through profit or loss are financial instruments held for trading. A financial liability is held for trading if it is incurred principally for the purpose of repurchasing in the near term. A derivative that is not a designated as hedging instruments and an embedded derivative that is separated are also classified as held for trading.

The Group classifies non-derivative financial liabilities, except for financial liabilities at fair value through profit or loss, financial guarantee contracts and financial liabilities that arise when a

transfer of financial assets does not qualify for derecognition, as financial liabilities carried at amortized cost and present as 'trade payables', 'borrowings', and 'other payables' in the statement of financial position.

Borrowings are initially recognized at fair value, net of transaction costs incurred. Borrowings are subsequently measured at amortized cost. Any difference between the proceeds (net of transaction costs) and the redemption amount is recognized in profit or loss over the period of the borrowings using the effective interest method. Fees paid on the establishment of loan facilities are recognized as transaction costs of the loan to the extent that it is probable that some or all of the facility will be drawn down. In this case, the fee is deferred until the draw-down occurs. To the extent there is no evidence that it is probable that some or all of the facility will be drawn down, the fee is capitalized as a prepayment for liquidity services and amortized over the period of the facility to which it relates.

Borrowings are classified as current liabilities unless the Group has an unconditional right to defer settlement of the liability for at least 12 months after the reporting period.

(b) Derecognition

Financial liabilities are removed from the statement of financial position when it is extinguished; for example, when the obligation specified in the contract is discharged or cancelled or expired or when the terms of an existing financial liability are substantially modified. The difference between the carrying amount of a financial liability extinguished or transferred to another party and the consideration paid (including any non-cash assets transferred or liabilities assumed) is recognized in profit or loss.

2.20 Financial Guarantee Contracts

Financial guarantee contract is recognized as a financial liability at the time the guarantee is issued. The liability is initially measured at fair value, subsequently at the higher of following and recognized in the statement of financial position within 'other financial liabilities'.

- the amount determined in accordance with the expected credit loss model under Korean IFRS 1109 *Financial Instruments* and

- the amount initially recognized less, where appropriate, the cumulative amount of income recognized in accordance with Korean IFRS 1115 *Revenue from Contracts with Customers*

2.21 Compound Financial Instruments

Compound financial instruments that the Group has issued are exchangeable bonds that can be exchanged into equity instruments at the option of the holder.

The liability component of this compound financial instrument is recognized initially at the fair value and subsequently recognized at amortized cost until conversion or maturity of the bonds. The equity component is remeasured at fair value until conversion or maturity of the bonds. Any directly attributable transaction costs are allocated to the liability and equity components in proportion to their initial carrying amounts.

2.22 Current and Deferred Tax

The tax expense for the period consists of current and deferred tax. Current and deferred tax is recognized in profit or loss, except to the extent that it relates to items recognized in other comprehensive income or directly in equity. In this case, the tax is also recognized in other comprehensive income or directly in equity, respectively.

The current income tax expense is measured at the amount expected to be paid to the taxation authorities, using the tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. Management periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation, and considers whether it is probable that a taxation authority will accept an uncertain tax treatment. The Group measures its tax balances either based on the most likely amount or the expected value, depending on which method provides a better prediction of the resolution of the uncertainty.

Deferred income tax is provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements. However, deferred income tax is not accounted for if it arises from initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither accounting nor taxable profit or loss.

Deferred tax assets are recognized only if it is probable that future taxable amounts will be available to utilize those temporary differences and losses.

The Group recognizes a deferred tax liability all taxable temporary differences associated with investments in subsidiaries, associates, and interests in joint arrangements, except to the extent that the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. In addition, The Group recognizes a deferred tax asset for all deductible temporary differences arising from such investments to the extent that it is probable the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized.

Deferred tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets and liabilities and when the deferred tax balances relate to the same taxation authority. Current tax assets and tax liabilities are offset when the Group has a legally enforceable right to offset and intends either to settle on a net basis, or to realize the assets and settle the liability simultaneously.

2.23 Provisions

Provisions for service warranties, make good obligation, and legal claims are recognized when the Group has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources will be required to settle the obligation and the amount can be reliably estimated. Provisions are measured at the present value of management's best estimate of the expenditure required to settle the present obligation at the end of the reporting period, and the increase in the provision due to the passage of time is recognized as interest expense.

2.24 Greenhouse Gas Emissions Permits and Obligations

With enforcement of *The Act on the Allocation and Trading of Greenhouse Gas Emission Permits,* the permits that are received free of charge from the government are measured at zero while permits purchased are measured at acquisition cost and stated net of accumulated impairment loss. Emissions obligations are measured as the sum of the carrying amount of the allocated permits that will be submitted to the government and the best estimate of expenditure required to settle the obligation at the end of reporting period for any excess emission. The permits and emissions obligations are classified as intangible assets and provisions, respectively, in the consolidated statement of financial position.

2.25 Employee Benefits

(a) Post-employment benefits

The Group operates both defined contribution and defined benefit pension plans. For defined contribution plans, the Group pays contribution to publicly or privately administered pension insurance plans on mandatory, contractual or voluntary basis. The Group has no further payment obligation once the contribution has been paid. The contribution is recognized as employee benefit expense when they are due. A defined benefit plan is a pension plan that is not a defined contribution plan.

Generally, post-employment benefits are payable after the completion of employment, and the benefit amount depended on the employee's age, periods of service or salary levels. The liability recognized in the statement of financial position in respect of defined benefit pension plans is the present value of the defined benefit obligation at the end of the reporting period less the fair value of plan assets. The defined benefit obligation is calculated annually by independent actuaries using the projected unit credit method. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using interest rates of high-quality corporate bonds that are denominated in the currency in which the benefits will be paid, and that have terms approximating to the terms of the related obligation. Remeasurement gains and losses arising from experience adjustments and changes in actuarial assumptions are recognized in the period in which they occur, directly in other comprehensive income.

Changes in the present value of the defined benefit obligation resulting from plan amendments or curtailments are recognized immediately in profit or loss as past service costs.

(b) Other long-term employee benefits

Certain entities within the Group provide long-term employee benefits that are entitled to employees with service period for ten years and above. The expected costs of these benefits are accrued over the period of employment using the same accounting methodology as used for defined benefit pension plans. The Group recognizes service cost, net interest on other long-term employee benefits and remeasurements as profit or loss for the year. These liabilities are valued annually by an independent qualified actuary.

2.26 Revenue Recognition

(a) Identify performance obligation

With regard to the contract of selling products to the customer, the Group identifies the services provided separately to the customer as a different performance obligation. When the Group makes a sales contract with the customer, the standard warranty period for each product and customer is set up considering the legal warranty period. Even though the standard warranty period has been expired, the warranties are recognized as a revenue and is identified as a separate performance obligation when the Group provides additional warranties for the quality of product or when the customer has an option to purchase additional warranties separately.

(b) A performance obligation satisfied at a point in time

The revenue from the sale of goods is recognized at the time they are delivered to the customer. Delivery occurs when the products have been shipped to the specific location, the risks of obsolescence and loss have been transferred to the customer, and either the customer has accepted the products in accordance with the sales contract, the acceptance provisions have lapsed, or the group has objective evidence that all criteria for acceptance have been satisfied.

The goods are often sold with volume discounts, and it is the group's policy to sell its products to the customer with a right of return. Accumulated experience is used to estimate for the discounts and the refund, and the volume discounts is calculated based on the periodical forecast sales. The warranty provision for the sales and refund is reasonably estimated and recognized properly.

(c) Sales return

A gross contract liability for the expected refunds to customers is recognized as adjustment to revenue, and the Group has a right to recover the product from the customer where the customer exercises his right of return and recognizes an asset and a corresponding adjustment to cost of sales. A right to recover the products is measured at former carrying amount of the product less the costs to recover the products.

(d) Significant financing component

As a practical expedient, the Group need not adjust the promised amount of consideration for the effects of a significant financing component as the period between when the entity transfers a promised good or service to a customer and when the customer pays for that good or service is generally one year or less.

2.27 Lease

Lease activities and accounting policies of the Group

Lease income from operating leases where the Group is a lessor is recognized in income on a straight-line basis over the lease term. Initial direct costs incurred in obtaining an operating lease are added to the carrying amount of the underlying asset and recognized as expense over the lease term on the same basis as lease income. The respective leased assets are included in the statement of financial position based on their nature.

The Group leases various machinery, real estate and cars. Lease contracts are typically made for fixed periods, but may have extension options. Lease terms are negotiated on an individual basis and contain a wide range of different terms and conditions. The lease agreements do not impose any covenants, but leased assets may not be used as security for borrowing purposes.

Leases are recognized as a right-of-use asset and a corresponding liability at the date at which the leased asset is available for use by the Group. Each lease payment is allocated between the liability and finance cost. The finance cost is charged to profit or loss over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period. The right-of-use asset is depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis.

Assets and liabilities arising from a lease are initially measured on a present value basis. Lease liabilities include the net present value of the following lease payments:

- Fixed payments (including in-substance fixed payments), less any lease incentives receivable
- Variable lease payment that are based on an index or a rate, initially measured using the index or rate as at the commencement date
- Amounts expected to be payable by the Group (the lessee) under residual value guarantees
- The exercise price of a purchase option if the Group (the lessee) is reasonably certain to

exercise that option, and

- Payments of penalties for terminating the lease, if the lease term reflects the Group (the lessee) exercising that option

If the Group is reasonably certain to exercise a purchase option, the right-of-use asset is depreciated over the useful life of the underlying asset.

The lease payments are discounted using the interest rate implicit in the lease. If that rate cannot be determined, the lessee's incremental borrowing rate is used, being the rate that the lessee would have to pay to borrow the funds necessary to obtain an asset of similar value in a similar economic environment with similar terms and conditions.

Right-of-use assets are measured at cost comprising the following:

- the amount of the initial measurement of lease liability
- any lease payments made at or before the commencement date less any lease incentives received
- any initial direct costs, and
- restoration costs

Payments associated with short-term leases or leases of low-value assets are recognized on a straight-line basis as an expense in profit or loss. Short-term leases are leases with a lease term of 12 months or less. Low-value assets comprise IT-equipment and small items of office furniture.

(a) Variable lease payments

Some property leases contain variable payment terms that are linked to sales generated from a warehouse. Variable lease payments that depend on usage are recognized in profit or loss in the period in which the condition that triggers those payments occurs.

(b) Extension and termination options

Extension and termination options are included in a number of leases across the Group. These terms are used to maximize operational flexibility in terms of managing contracts. The majority of extension and termination options held are exercisable only by the Group and not by the respective lessor.

The Group determines the lease term as the non-cancellable period of a lease within the period for which the contract is enforceable, together with both (a) periods covered by an option to extend the lease if the lessee is reasonably certain to exercise that option; and (b) periods covered by an option to terminate the lease if the lessee is reasonably certain not to exercise that option. When both lessee and lessor have the right to terminate the lease without permission from the other party, the Group considers the contractual termination payments in determining the period for which the contract is enforceable.

2.28 Segment Reporting

Information of each operating segment is reported in a manner consistent with the business segment reporting provided to the chief operating decision-maker. The chief operating decision-

maker is responsible for allocating resources and assessing performance of the operating segments and the Group has identified the Board of Directors as the chief operating decision-maker.

3. Financial Risk Management

3.1 Financial Risk Factors

The Group's activities expose it to a variety of financial risks: market risk, credit risk and liquidity risk. The Group's overall risk management program focuses on the unpredictability of financial markets and seeks to minimize potential adverse effects on the financial performance of the Group. The Group uses derivative financial instruments to hedge certain risk exposures.

Risk management is carried out by the Group's finance team under policies approved by the Corporate Management Committee. The finance team identifies, evaluates and hedges financial risks in close co-operation with the Group's operating units. The Corporate Management Committee reviews and approves written principles for overall risk management, as well as written policies covering specific areas, such as foreign exchange risk, interest rate risk, and credit risk, use of derivative financial instruments and non-derivative financial instruments, investment of excess liquidity.

(1) Market risk

1) Foreign exchange risk

The Group operates internationally and is exposed to foreign exchange risk arising from foreign currency exposures, primarily with respect to the US dollar. Foreign exchange risk arises from future commercial transactions, recognized assets and liabilities.

Management has set up a policy to require group companies to manage their foreign exchange risk against their functional currency. The Group manages maximum loss for currency risk exposures within acceptable range by using currency risk management model and hires employees who are exclusively responsible for currency risk management.

The Group has certain investments in foreign operations, whose net assets are exposed to foreign currency translation risk. Currency exposure arising from the net assets of the Group's foreign operations is managed primarily through borrowings denominated in the relevant foreign currencies.

As at December 31, 2021 and 2020, the Group's monetary assets and liabilities denominated in currencies other than its functional currency, are as follows:

(in millions of Korean won)	2021		2020	
	Assets	**Liabilities**	**Assets**	**Liabilities**
USD	5,708,219	5,741,611	4,367,761	3,805,638
EUR	441,123	4,804,639	244,382	4,479,131
JPY	18,315	96,238	20,035	303,704
CNY and others	523,907	4,131	343,749	8,199

As at December 31, 2021 and 2020, if the Group's functional currency had weakened / strengthened by 10% against the US dollar with all other variables held constant, profit before income tax would have been affected as follows:

(in millions of Korean won)	2021		2020	
	10% Increase	**10% Decrease**	**10% Increase**	**10% Decrease**
USD	31,708	(31,708)	77,289	(77,289)
EUR	(413,462)	413,462	(416,016)	416,016

The above sensitivity analysis has been performed for monetary assets and liabilities denominated in foreign currencies other than the Group's functional currency at the reporting date.

As at December 31, 2021 and 2020, the Group entered into foreign currency forward contracts to manage risk from changes in exchange rates as follows:

(in millions of Korean won and in millions of US dollars)

	2021						
	Contractor	**Contract amount**	**Contract exchange rate**	**Contract inception date**	**Contract maturity**	**Book amount**	
						Assets	**Liabilities**
Currency Forward[1]	KDB	USD 35	1,135.60	2021.6.24	2022.6.24	1,789	-
	Shinhan Bank	USD 500	1,135.60	2020.10.14	2024.10.15	24,687	-
	KB Kookmin Bank	USD 500	1,102.83	2020.11.24	2029.4.16	30,232	-
	Citi	EUR 150	4.5900[2]	2021.5.12	2022.4.29	2,881	-
	SC	EUR 250	4.5861[2]	2021.5.14	2022.4.29	4,703	-
	CACIB	EUR 100	4.6055[2]	2021.8.5	2022.8.4	2,964	-
	KDB	EUR 165	4.6036[2]	2021.8.5	2022.8.4	4,925	-
	ING	EUR 100	4.7120[2]	2021.10.22	2022.10.21	1,420	-
Currency swap	SMBC	USD 200	1,118.00	2021.5.28	2024.5.28	13,556	-
	KDB	USD 130	1,135.60	2021.6.24	2025.6.24	8,817	-
	KDB	USD 35	1,135.60	2021.6.24	2026.6.24	2,319	-
	Shinhan Bank	USD 300	1,131.80	2021.7.7	2026.7.7	12,196	-
	Woori Bank	USD 100	1,131.80	2021.7.7	2026.7.7	4,380	-
	Industrial and Commercial Bank of China	USD 100	1,131.80	2021.7.7	2026.7.7	4,653	-

Shinhan Bank	USD 100	1,131.80	2021.7.7	2031.7.7	4,804	-
Woori Bank	USD 200	1,131.80	2021.7.7	2031.7.7	10,032	-
KDB	USD 200	1,131.80	2021.7.7	2031.7.7	10,429	-

[1] Derivatives that are not qualified for hedge accounting.
[2] Cross exchange rate between PLN and EUR.

(in millions of Korean won and in millions of US dollars)

		2020					
	Contractor	Contract amount	Contract exchange rate	Contract inception date	Contract maturity	Book amount	
						Assets	Liabilities
Currency forward	Shinhan Bank	USD 500	1,135.60	2020.10.14	2024.10.15	-	23,115
	KB Kookmin Bank	USD 500	1,102.83	2020.11.24	2029.04.16	-	18,653

2) Price risk

The Group is exposed to equity securities price risk arises from investments held by the Group and classified in the consolidated statement of financial position as non-current financial assets. The Group's equity investments are publicly traded and are related to the NASDAQ and ASX index.

The table below summarizes the impact of increases/decreases of the listed stock price index on the Group's equity before tax effects as at December 31, 2021 and 2020. The analysis is based on the assumption that the equity index has increased/decreased by 10% with all other variables held constant, and that all the Group's equity instruments moved in line with the index.

(in millions of Korean won)	2021		2020	
	10% Increase	10% Decrease	10% Increase	10% Decrease
KOSDAQ	909	(909)	997	(997)
ASX	676	(676)	-	-
Total	1,585	(1,585)	997	(997)

3) Interest rate risk

Interest rate risk is defined as the risk that the interest income or expenses arising from deposits and borrowings will fluctuate because of changes in future market interest rate. The interest rate risk mainly arises through floating rate deposits and borrowings. The objective of interest rate risk management lies in maximizing corporate value by minimizing uncertainty in interest rates fluctuations and net interest expense.

The Group adequately minimizes risks from interest rate fluctuations through various policies, such as sharing excess cash within the Group (internal cash sharing) to minimize external borrowings, avoiding high rate borrowings, reforming capital structure, managing an appropriate ratio of fixed rate borrowings and floating rate borrowings, monitoring a fluctuation of domestic and foreign interest rates daily, weekly and monthly, establishing alternatives, and balancing floating rate short-term borrowings with floating rate deposits.

The table below summarizes the impact of increases/decreases of interest rate on the Group's equity and post-tax profit for the year. The analysis is based on the assumption that the interest rate has increased/decreased by 1% (100 basis points) with all other variables held constant.

(in millions of Korean won)	Impact on post-tax profit		Impact on equity	
	2021	2020	2021	2020
Increase	(38,741)	(36,812)	(38,741)	(36,812)
Decrease	38,741	36,812	38,741	36,812

The Group has entered into a currency interest rate swap contract amounting to USD 165 million (equivalent to ₩195,508 million) to hedge interest rate risk of variable interest rate borrowings from Korea Development Bank and others.

(2) Credit risk

Credit risk arises from trade receivables and that the Group holds, as well as debt instruments at amortized cost or fair value through other comprehensive income.

1) Trade receivables

The Group applies the simplified approach to measuring expected credit losses which uses a lifetime expected loss allowance for trade receivables. To measure the expected credit losses, trade receivables have been grouped based on shared credit risk characteristics and the days past due. The loss allowance provision as at December 31, 2021 is as follows. Expected credit losses include forward-looking information.

(in millions of Korean won)	Receivables not past due[1]	Receivables past due but not impaired[1]	Impaired receivables[2]	Total
December 31, 2021 (trade receivables)				
Gross carrying amount	6,118,779	338,693	1,656	6,459,128
Expected loss rate	0.1%	0.2%	81.5%	0.1%
Loss allowance provision	3,152	592	1,350	5,094
December 31, 2020 (trade receivables)				
Gross carrying amount	4,835,299	493,371	3,462	5,332,132
Expected loss rate	0.0%	0.1%	54.7%	0.1%
Loss allowance provision	2,032	467	1,892	4,391

[1] See Note 7.(3) for aging analysis.
[2] Impaired receivables are those for which impairment indicators have been confirmed, such as significant lack of collectability.

Movements in the loss allowance provision for trade receivables for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	Trade receivables	
	2021	**2020**
Beginning balance	4,391	5,830
Reversal of loss allowance recognized in profit or loss	(127)	(480)
Receivables written off as uncollectible	(447)	(833)
Exchange differences	1,277	(126)
Ending balance	5,094	4,391

As at December 31, 2021, the carrying amount of trade receivables representing the maximum exposure to credit risk amounts to ₩6,454,034 million (2020: ₩5,327,741 million).

2) Other financial assets at amortized cost

Movements in loss allowance provision for other financial assets at amortized cost for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	Other receivables	
	2021	**2020**
Beginning balance	2,165	2,109
Increase in loss allowance recognized as 'other non-operating expenses' in profit or loss	-	2
Exchange differences	-	54
Ending balance	2,165	2,165

All of the financial assets at amortized costs are considered to have low credit risk, and the loss allowance recognized during the period was, therefore, limited to 12 months expected losses.

The Group has established the following policies and procedures to manage credit risks.

To manage credit risks relating to trade receivables, the Group evaluates the credit rating of customers and determines credit limit for each customer based on the information provided by credit rating agencies and other available financial information before commencing business with new customers. The credit risks relating to trade receivables are also mitigated by insurance contracts, collateral as well as payment guarantees.

The Group has entered into export bond insurance contracts with Korea Trade Insurance Corporation to mitigate credit risks relating to export trade receivables to overseas customers. The Group is also provided with collateral by customers depending on their credit rating or payment guarantees from the customers' financial institutions if necessary.

The Group has deposited its cash and cash equivalents and other long-term deposits in several financial institutions, such as Woori Bank and others. The Group has also entered into derivative contract with several financial institutions. The Group maintains business relationship with those financial institutions with high credit ratings evaluated by independent credit rating agencies and accordingly, credit risks associated with these financial institutions are limited.

(3) Liquidity risk

Finance team of the Group monitors rolling forecasts of the Group's liquidity requirements to ensure it has sufficient cash to meet operational needs while maintaining sufficient headroom on its undrawn committed borrowing facilities at all times so that the Group does not breach borrowing limits or covenants (where applicable) on any of its borrowing facilities. The Group's liquidity management policy involves projecting cash flows in major currencies and considering the level of liquid assets necessary to meet these, monitoring balance sheet liquidity ratios against internal and external regulatory requirements and maintaining debt financing plans.

The table below analyzes the Group's non-derivative financial liabilities into relevant maturity groupings based on the remaining period at the reporting period to the contractual maturity date. Cash flows presented below are gross cash flows before discount, and includes cash flows for interests.

(in millions of Korean won)	**2021**			
	Less than 1 year	**Between 1-2 years**	**Between 2-5 years**	**Over 5 years**
Non-derivative financial instruments				
Borrowings (excluding lease liabilities)	3,548,442	2,403,648	5,984,843	3,551,215
Lease liabilities	82,568	54,416	87,498	156,494
Trade and other payables[1]	7,733,917	13,757	1,694	171
	11,364,927	2,471,821	6,074,035	3,707,880
Derivative instruments				
Gross settlement currency forwards and swaps				
(Inflows)	(1,096,082)	(27,579)	(1,690,054)	(1,255,889)
Outflows	1,096,734	26,825	1,613,263	1,181,161
	652	(754)	(76,791)	(74,728)
	11,365,579	2,471,067	5,997,244	3,633,152

(in millions of Korean won)	**2020**			
	Less than 1 year	**Between 1-2 years**	**Between 2-5 years**	**Over 5 years**
Non-derivative financial instruments				
Borrowings (excluding lease liabilities)	1,665,869	1,876,344	4,941,527	2,239,926
Lease liabilities	59,636	33,536	44,091	75,581
Trade and other payables[1]	8,725,500	11,756	-	171
	10,451,005	1,921,636	4,985,618	2,315,678
Derivative instruments				
Gross settlement currency forwards				
(Inflows)	-	-	(544,000)	(544,000)
Outflows	-	-	567,800	551,415
	-	-	23,800	7,415
	10,451,005	1,921,636	5,009,418	2,323,093

[1] Included ₩301,946 million (2020: ₩2,099,936 million) of financial liabilities due to a financial institution relating to reverse factoring arrangement. The Group has entered into reverse factoring arrangement (interest rate CD 91 days + 0.93~1.20%) with a financial institution whereby suppliers receive payments from the financial institution on the due date of each invoice and the Group pays to the financial institution at the end of extended credit period as agreed in the reverse factoring arrangement.

As at December 31, 2021, the Group has entered into swap contracts for which cash flow hedge accounting is applied, to avoid market price fluctuation of raw materials.

(in millions of Korean won)	2021				
	Purpose of the contracts	**Hedged items**	**Financial institution**	**Maturity**	**Fair value**
Merchandise (raw materials) swap[1]	Cash flow hedge	Non-ferrous metal	Citi bank and SC	~2024. 12	5,785

Details of derivative assets and liabilities as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021		2020	
	Assets	**Liabilities**	**Assets**	**Liabilities**
Merchandise (raw materials) swap[1]	5,911	126	23,821	-

[1] Gain (loss) resulting from the contracts to avoid cash flow fluctuation risk of expected future transaction is accounted for as accumulated other comprehensive income which corresponds to an effective portion of the hedges (Note 5).

3.2 Capital Risk Management

The Group's objectives for managing capital are to safeguard the Group's ability to continue as a going concern, so the Group can continue to provide returns for shareholders and benefits for other stakeholders, and to maintain an optimal capital structure to reduce the cost of capital.

Consistent with others in the industry, the Group monitors capital on the basis of the gearing ratio. This ratio is calculated as net debt divided by total capital. Net debt is calculated as total borrowings less cash and cash equivalents. Total capital is calculated as 'equity' as shown in the consolidated statement of financial position plus net debt.

The gearing ratio and debt-to-equity ratio as at December 31, 2021 and 2020, were as follows:

(in millions of Korean won, except for ratios)	**2021**	**2020**
Total borrowings (Note 14) (A)	14,765,734	10,186,117
Less: cash and cash equivalents (B)	(3,760,834)	(3,274,250)
Net debt (C=A+B)	11,004,900	6,911,867
Total liabilities (D)	27,925,314	22,598,454
Total equity (E)	23,209,988	18,790,440
Total capital (F=C+E)	34,214,888	25,702,307
Gearing ratio (C/F)	32.2%	26.9%
Debt-to-equity ratio (D/E)	120.3%	120.3%

3.3 Fair Value

(1) Carrying amount and fair value of financial instruments by category as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**		**2020**	
	Carrying amount	**Fair value**	**Carrying amount**	**Fair value**
Financial assets (current)				
Cash and cash equivalents	3,760,834	[1]	3,274,250	[1]
Deposits held by financial institutions	64,583	[1]	608,039	[1]
Trade receivables	6,386,979	[1]	5,298,365	[1]
Other receivables (excluding deposits held by financial institutions)	983,966	[1]	316,264	[1]
Current derivative financial assets (excluding currency forward)	4,606	4,606	23,821	23,821
Current derivative financial assets (currency forward)	18,683	18,683	-	-
Financial assets (non-current)				
Deposits held by financial institutions	267,116	[1]	167,054	[1]
Trade receivables	67,055	[1]	29,376	[1]
Other receivables (excluding deposits held by financial institutions)	446,050	[1]	87,976	[1]
Other non-current financial assets (carried at fair value)				
Marketable financial assets	21,630	21,630	7,679	7,679
Non-marketable financial assets[2]	340,823	340,823	73,853	73,853
Non-current derivative financial assets (currency forward)	54,918	54,918		
Non-current derivative financial assets (excluding currency forward)	88,651	88,651		
Financial liabilities (current)				
Trade and other payables	7,733,916	[1]	8,725,500	[1]
Current borrowings (excluding exchangeable bonds and lease liabilities)	3,405,215	[1]	1,460,926	[1]

(in millions of Korean won)	2021		2020	
	Carrying amount	Fair value	Carrying amount	Fair value
Current borrowings (exchangeable bonds)	-	-	32,500	32,763
Current lease liabilities	71,865	[3]	55,389	[3]
Current derivative financial liabilities (exchange rights)	-	-	16,797	16,797
Financial liabilities (non-current)				
Non-current borrowings (excluding lease liabilities)	11,041,274	10,923,942	8,508,066	8,614,889
Non-current lease liabilities	247,380	[3]	129,236	[3]
Other non-current payables	15,623	[1]	11,927	[1]
Non-current derivative financial liabilities (excluding currency forward)	126	126		
Non-current derivative financial liabilities (currency forward)	-	-	41,768	41,768

[1] These financial assets and liabilities are not included in the disclosure above as their carrying amount is a reasonable approximation of the fair value.
[2] Acquisition costs of these financial assets approximate their fair values.
[3] Fair values for these financial assets and liabilities are not disclosed above in accordance with related Korean IFRS.

(2) Fair value for measurement and disclosure are determined based on the following method:

Fair values of financial liabilities (non-current) are based on cash outflows discounted by using Korean won currency note yield in the same credit grade with the Parent Company (AA+), and the applied discount rates as at December 31, 2021 and 2020, are as follows:

(in percentage)	2021	2020
Discount rate	1.77% ~ 2.99%	0.97% ~ 2.27%

(3) Fair value hierarchy

Items that are measured at fair value are categorized by the fair value hierarchy levels, and the defined levels are as follows:

- Quoted prices (unadjusted) in active markets for identical assets or liabilities that an entity can access at the measurement date (Level 1).
- All inputs other than quoted prices included in level 1 that are observable (either directly that is, prices, or indirectly that is, derived from prices) for the asset or liability (Level 2).
- Unobservable inputs for the asset or liability (Level 3).

Fair value hierarchy classifications of the financial instruments that are measured at fair value or their fair value are disclosed as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021			
	Level 1	**Level 2**	**Level 3**	**Total**
Financial assets/liabilities measured at fair value				
Other non-current financial assets (marketable financial assets)	21,630	-	-	21,630
Other non-current financial assets (non-marketable financial assets)	-	-	340,823	340,823
Current derivative financial assets (excluding currency forward)	-	4,606	-	4,606
Current derivative financial assets (currency forward)	-	18,683	-	18,683
Non-current derivative financial assets (currency forward)	-	54,918	-	54,918
Non-current derivative financial assets (excluding currency forward)	-	72,491	16,160	88,651
Non-current derivative financial liabilities (excluding currency forward)	-	126	-	126
Financial assets/liabilities not measured at fair value				
Non-current borrowings (excluding lease liabilities)	-	10,923,942	-	10,923,942

(in millions of Korean won)	2020			
	Level 1	**Level 2**	**Level 3**	**Total**
Financial assets/liabilities measured at fair value				
Other non-current financial assets (marketable financial assets)	7,679	-	-	7,679
Other non-current financial assets (non-marketable financial assets)	-	-	73,853	73,853
Current derivative financial assets	-	23,821	-	23,821
Current derivative financial liabilities (exchange rights) [1]	-	-	16,797	16,797
Current derivative financial liabilities (currency forward)	-	41,768	-	41,768
Financial assets/liabilities not measured at fair value				
Current borrowings (exchangeable bonds)	-	-	32,763	32,763
Non-current borrowings (excluding lease liabilities)	-	8,614,889	-	8,614,889

[1] Movements in exchange rights are as follows.

(in millions of Korean won)	USD		EUR		Total	
	2021	2020	2021	2020	2021	2020
Beginning Balance	-	42	16,797	888	16,797	930
Exchange	-	(89,961)	(24,835)	(188,303)	(24,835)	(278,264)
Redemption	-	(70)	(2,440)	-	(2,440)	(70)
Evaluation	-	89,989	10,478	204,212	10,478	294,201
Ending Balance	-	-	-	16,797	-	16,797

(4) Valuation technique and the inputs

Valuation techniques and inputs used in the fair value measurements categorized within Level 3 of the fair value hierarchy as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021				
	Fair value	**Level**	**Valuation Technique**	**Inputs**	**Coverage of Level 3 inputs**
Equity instrument					
Non-listed shares	97,121	3	Present value technique	Long-term growth rate through subsequent cash flows	1.00%
				Weighted average cost of equity	10.98% ~ 12.2%
Derivative instruments					
Option	16,160	3	Binominal option pricing model	Volatility	2.36 ~ 2.4%

(in millions of Korean won)	2020				
	Fair value	**Level**	**Valuation Technique**	**Inputs**	**Coverage of Level 3 inputs**
Financial liabilities – Exchangeable Bond					
Exchangeable Bond	32,763	3	Binominal option pricing model	Annual rates of credit volatility	-0.5%p ~ +0.5%p
Exchange right	16,797	3	Binominal option pricing model	Annual rates of credit volatility	-0.5%p ~ +0.5%p
				Underlying asset (equity) volatility	-5.0% ~ +5.0%

4. Critical Accounting Estimates and Assumptions

The preparation of financial statements requires the Group to make estimates and assumptions concerning the future. Management also needs to exercise judgement in applying the Group's accounting policies. Estimates and assumptions are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. The resulting accounting estimates may differ from the related actual results. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below.

The spread of COVID-19 during 2021 has impacted significantly on the domestic and international economies. This may affect the company's financial position and business performance.

Significant accounting estimates and assumptions used in the preparation of financial statements may be adjusted according to fluctuations in uncertainty arising from COVID-19, and the ultimate impact of COVID-19 on the company's business, financial position, and performance is currently unpredictable.

(a) Impairment test of goodwill

The Group tests whether goodwill has suffered any impairment on an annual basis. The recoverable amount of a cash generating unit (CGU) is determined based on value-in-use or fair value less cost of disposal calculations (Note 12).

(b) Income taxes

If certain portion of the taxable income is not used for investments or increase in wages or dividends in accordance with the *Tax System for Recirculation of Corporate Income*, the Group is liable to pay additional income tax calculated based on the tax laws. Accordingly, the measurement of current and deferred income tax is affected by the tax effects from the new tax system. As the Group's income tax is dependent on the investments, increase in wages and dividends, there is an uncertainty measuring the final tax effects.

(c) Provisions

The Group recognizes provisions for product warranties as explained in Note 15. These provisions are estimated based on the past experience. Provisions related to voluntary recall by the Group's customer are estimated based on the number of vehicles subject to recall, estimated total repair costs, and cost sharing ratio.

(d) Fair value of financial instruments

The fair value of financial instruments that are not traded in an active market is determined by using valuation techniques. The Group uses its judgment to select a variety of methods and make assumptions that are mainly based on market conditions existing at the end of each reporting period (Note 3.3).

(e) Impairment of financial assets

The provision for impairment for financial assets are based on assumptions about risk of default and expected loss rates. The Group uses judgement in making these assumptions and selecting the inputs to the impairment calculation based on the Group's past experience, existing market

conditions as well as forward looking estimates at the end of each reporting period (Note 3.1.(2)).

(f) Net defined benefit liabilities

The present value of net defined benefit liability depends on a number of factors that are determined on an actuarial basis using a number of assumptions including the discount rate (Note 16).

(g) Lease

In determining the lease term, management considers all facts and circumstances that create an economic incentive to exercise an extension option, or not exercise a termination option. Extension options (or periods after termination options) are only included in the lease term if the lease is reasonably certain to be extended (or not terminated).

The lease term is reassessed if an option is actually exercised (or not exercised) or the Group becomes obliged to exercise (or not exercise) it. The assessment of reasonable certainty is only revised if a significant event or a significant change in circumstances occurs, which affects this assessment, and that is within the control of the lessee.

5. Financial Instruments by Category

Categorizations of financial instruments as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)

	2021				
Financial assets	**Financial assets at amortized cost**	**Financial assets at fair value through profit or loss**	**Financial assets at fair value through other comprehensive income**	**Other financial assets[1]**	**Total**
Cash and cash equivalents	3,760,834	-	-	-	3,760,834
Trade receivables	5,898,369	-	488,610	-	6,386,979
Non-current trade receivables	67,055	-	-	-	67,055
Other receivables	1,047,224	-	1,325	-	1,048,549
Other non-current receivables	713,166	-	-	-	713,166
Other current financial assets	-	-	-	23,289	23,289
Other non-current financial assets	-	160,145	202,308	143,569	506,022
Total	11,486,648	160,145	692,243	166,858	12,505,894

(in millions of Korean won)

	2021		
Financial liabilities	**Financial liabilities at amortized cost**	**Other financial liabilities[2]**	**Total**
Trade payables	3,742,132	-	3,742,132
Other payables	3,991,784	-	3,991,784
Borrowings (current)	3,405,215	71,865	3,477,080
Other non-current financial liabilities	-	126	126
Other non-current payables	15,623	-	15,623
Borrowings (non-current)	11,041,274	247,380	11,288,654
Total	22,196,028	319,371	22,515,399

(in millions of Korean won)

	2020				
Financial assets	**Financial assets at amortized cost**	**Financial assets at fair value through profit or loss**	**Financial assets at fair value through other comprehensive income**	**Other financial assets[1]**	**Total**
Cash and cash equivalents	3,274,250	-	-	-	3,274,250
Trade receivables	4,876,565	-	421,800	-	5,298,365
Non-current trade receivables	29,376	-	-	-	29,376
Other receivables	904,640	-	19,663	-	924,303
Other non-current receivables	255,030	-	-	-	255,030
Other current financial assets	-	-	-	23,821	23,821
Other non-current financial assets	-	29,316	52,216	-	81,532
Total	9,339,861	29,316	493,679	23,821	9,886,677

(in millions of Korean won)	2020			
Financial liabilities	**Financial liabilities at fair value through profit or loss**	**Financial liabilities at amortized cost**	**Other financial liabilities[2]**	**Total**
Trade payables	-	3,458,526	-	3,458,526
Other payables	-	5,266,974	-	5,266,974
Borrowings (current)	-	1,493,426	55,389	1,548,815
Other current financial liabilities	16,797	-	-	16,797
Other non-current financial liabilities	-	-	41,768	41,768
Other non-current payables	-	11,927	-	11,927
Borrowings (non-current)	-	8,508,066	129,236	8,637,302
Total	16,797	18,738,919	226,393	18,982,109

[1] Other financial assets include derivative assets that are not subject to the categorizations.
[2] Other financial liabilities include lease liabilities and derivative liabilities that are not subject to the categorizations.

Net gains or losses on each category of financial instruments for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Dividend income		
Financial assets at fair value through other comprehensive income	7,376	2,562
Interest income		
Financial assets at amortized cost	75,745	35,924
Interest expense		
Financial liabilities at amortized cost	(246,716)	(231,865)
Other financial liabilities	(8,671)	(9,578)
Financial assets at amortized cost[1]	(507)	(912)
Financial assets at fair value through other comprehensive income[1]	(998)	(2,864)
Gain (loss) on valuation		
Financial assets at fair value through profit or loss	29,810	3,898
Financial assets at fair value through other comprehensive income	15,990	3,024
Derivative instruments	177,156	(322,967)
Exchange differences		
Financial assets at amortized cost	433,436	(360,456)
Financial liabilities at amortized cost	(389,776)	258
Other financial liabilities	(1,548)	(10,522)

[1] Fees paid to financial institutions for factoring.

6. Cash and Cash Equivalents

Details of cash and cash equivalents as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Bank deposits and cash on hand	1,943,818	1,704,420
Deposits held by financial institutions and others	1,817,016	1,569,830
Total	3,760,834	3,274,250

As at December 31, 2021, cash and cash equivalents include ₩42,483 million which is subject to a restriction on the use in association with the national R&D projects.

7. Trade and Other Receivables

Trade and other receivables and its provisions for impairment, as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**		
	Gross amount	**Provision for impairment**	**Carrying amount**
Trade receivables	6,392,073	(5,094)	6,386,979
Non-current trade receivables	67,055	-	67,055
Other current receivables	1,050,714	(2,165)	1,048,549
Other non-current receivables	713,166	-	713,166
Total	8,223,008	(7,259)	8,215,749

(in millions of Korean won)	**2020**		
	Gross amount	**Provision for impairment**	**Carrying amount**
Trade receivables	5,302,756	(4,391)	5,298,365
Non-current trade receivables	29,376	-	29,376
Other current receivables	926,468	(2,165)	924,303
Other non-current receivables	255,030	-	255,030
Total	6,513,630	(6,556)	6,507,074

Details of other receivables as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Current		
Non-trade receivables	865,984	271,651
Deposits held by financial institutions	64,583	608,039
Accrued income	31,955	2,567
Loans	65,266	-
Guarantee deposits provided	20,761	42,046
	1,048,549	924,303
Non-current		
Non-trade receivables	29,195	24,910
Deposits held by financial institutions[1]	267,116	167,054
Loans	330,643	831
Guarantee deposits provided	86,212	62,235
	713,166	255,030
Total	1,761,715	1,179,333

[1] As at December 31, 2021, ₩266,100 million (2020: ₩166,100 million) is restricted from being withdrawn in relation to large, small and medium-sized companies cooperation agreement and others. In addition, ₩120 million is restricted from withdrawal in connection with maintaining checking accounts (2020: ₩928 million). Also, PLN 3 million is withdrawal restricted in relation to overseas transportation of hazardous waste.

The aging analysis of trade and other receivables as at December 31, 2021 and 2020, is as follows:

(in millions of Korean won)	**2021**		**2020**	
	Trade receivables	**Other receivables**	**Trade receivables**	**Other receivables**
Receivables not past due	6,118,779	1,690,123	4,835,299	1,134,863
Past due but not impaired				
Up to 3 months	338,693	71,592	493,371	44,470
Between 3-6 months	236,860	70,136	333,522	41,780
Over 6 months	15,811	457	69,272	353
	86,022	999	90,577	2,337
Impaired receivables	1,656	2,165	3,462	2,165
Total	6,459,128	1,763,880	5,332,132	1,181,498

Movements on the provision for impairment of trade and other receivables for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	4,391	-	2,165	-
Reversal	(127)	-	-	-
Write-off	(447)	-	-	-
Exchange differences	1,277	-	-	-
Ending balance	5,094	-	2,165	-

(in millions of Korean won)	2020			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	5,830	-	2,109	-
Reversal	(480)	-	2	-
Write-off	(833)	-	-	-
Exchange differences	(126)	-	54	-
Ending balance	4,391	-	2,165	-

As at December 31, 2021 and 2020, the carrying amounts of trade and other receivables are approximation of their fair values.

The Group transferred trade and other receivables to financial institutions for ₩3,469 million at December 31, 2021 (2020: ₩168,781 million), and derecognized the trade and other receivables from the financial statements at the date of disposal, as substantial all the risks and rewards were transferred.

8. Other Financial Assets and Liabilities

Details of other financial assets and liabilities as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Other financial assets		
Financial assets at fair value through other comprehensive income (derivative instruments) (current)	4,606	23,821
Financial assets at fair value through profit or loss (derivative instruments) (current)	18,683	-
Financial assets at fair value through other comprehensive income (derivative instruments) (non-current)	1,305	-
Financial assets at fair value through other comprehensive income (excluding derivative instruments) (non-current)	202,308	52,216
Financial assets at fair value through profit or loss (derivative instruments) (non-current)	142,264	-
Financial assets at fair value through profit or loss (excluding derivative instruments) (non-current)	160,145	29,316
	529,311	105,353
Other financial liabilities		
Financial liabilities at fair value through profit or loss (exchange rights) (current)	-	16,797
Financial liabilities at fair value through other comprehensive income (derivative instruments) (current)	126	-
Financial liabilities at fair value through profit or loss (derivative instruments) (non-current)	-	41,768
	126	58,565

Changes in equity and debt instruments included in other financial assets for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Beginning balance	81,532	149,463
Acquisitions / transfer	248,354	18,120
Disposals	(16,388)	(91,251)
Gain on valuation (before income tax effects) through other comprehensive income	15,990	3,024
Gain on valuation (before income tax effects) through profit or loss	29,810	3,898
Others	3,154	(1,722)
Ending balance	362,452	81,532

During the years ended December 31, 2021 and 2020, the Group did not recognize impairment for other financial assets.

9. Inventories

Details of inventories as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021		
	Gross amount	**Valuation allowance**	**Carrying amount**
Merchandise	192,580	(6,131)	186,449
Finished / Semi-finished products	4,715,464	(233,613)	4,481,851
Work-in-process	25,587	-	25,587
Raw materials	2,040,432	(24,104)	2,016,328
Supplies	266,487	-	266,487
Materials-in-transit	1,306,772	-	1,306,772
Total	8,547,322	(263,848)	8,283,474

(in millions of Korean won)	2020		
	Gross amount	**Valuation allowance**	**Carrying amount**
Merchandise	130,457	(3,486)	126,971
Finished / Semi-finished products	3,087,998	(129,308)	2,958,690
Work-in-process	23,570	-	23,570
Raw materials	1,277,855	(17,100)	1,260,755
Supplies	188,503	-	188,503
Materials-in-transit	791,199	-	791,199
Total	5,499,582	(149,894)	5,349,688

During the year ended December 31, 2021, the cost of inventories recognized as expense and included in 'cost of sales' amounted to ₩23,888,071 million (2020: ₩17,676,619 million).

10. Investments in Associates and Joint Ventures

Changes in investments in associates and joint ventures for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021							
	Beginning balance	**Acquisitions / transfer**	**Dividends**	**Share of profit (loss) of associates and joint ventures**	**Share of other comprehensive income (loss) of associates and joint ventures**	**Impairment / disposals**	**Others**	**Ending balance**
VINA Plasticizers Chemical Co., Ltd.	5,875	-	(334)	7,204	77	-	-	12,822
HL Greenpower Co., Ltd.[1]	22,710	-	-	1,847	-	(24,323)	(234)	-
TECHWIN Co., Ltd.	20,113	-	-	(1,106)	17	-	-	19,024
SEETEC Co., Ltd	140,116	-	(10,000)	4,727	-	-	-	134,843
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	-	579
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	-	150
FJ Composite Materials Co., LTD.[1]	2,737	-	-	(544)	652	(2,576)	(269)	-
WUXI CL New Energy Technology Ltd[1]	-	-	-	-	-	-	-	-
LG Chem Life Sciences Poland Ltd.	17	-	-	-	-	-	-	17
Combustion Synthesis Co., Ltd.[1]	1,867	-	-	273	(106)	(1,969)	(65)	-
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	89,525	-	-	(5,537)	9,847	-	-	93,835
VINFAST LITHIUM BATTERY PACK LIMITED LIABILITY COMPANY	4,179	-	-	(730)	320	-	-	3,769
Jiangxi VL Battery Co.,Ltd	21,461	-	-	(3,471)	2,320	-	-	20,310
PT.HLI Green Power [2]	-	209,132	-	(9,201)	1,557	-	-	201,488
TL Chemical CO., Ltd [3]	-	48,544	-	(71)	-	-	-	48,473
	309,329	257,676	(10,334)	(6,609)	14,684	(28,868)	(568)	535,310

(in millions of Korean won)	2020							
	Beginning balance	Acquisitions / transfer	Dividends	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income (loss) of associates and joint ventures	Impairment / disposals	Others	Ending balance
LG VINA Chemical Co., Ltd.	4,403	-	-	1,782	(310)	-	-	5,875
HL Greenpower Co., Ltd.	23,366	-	-	(664)	-	-	8	22,710
LG Holdings (HK) Ltd.	40,973	-	-	436	(369)	(41,040)	-	-
TECHWIN Co., Ltd.	19,376	-	(314)	1,053	(2)	-	-	20,113
SEETEC Co., Ltd	142,554	-	(10,000)	7,205	-	-	357	140,116
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	-	579
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	-	150
FJ Composite Materials Co., LTD.	2,171	-	-	(142)	(162)	-	870	2,737
WUXI CL New Energy Technology Ltd	-	-	-	-	-	-	-	-
LG Chem Life Sciences Poland Ltd.	17	-	-	-	-	-	-	17
Combustion Synthesis Co., Ltd.	2,042	-	-	(88)	(68)	-	(19)	1,867
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	67,058	22,191	-	151	125	-	-	89,525
VINFAST LITHIUM BATTERY PACK LIMITED LIABILITY COMPANY	4,888	-	-	(461)	(248)	-	-	4,179
Jiangxi VL Battery Co.,Ltd	-	21,815	-	71	(425)	-	-	21,461
	307,577	44,006	(10,314)	9,343	(1,459)	(41,040)	1,216	309,329

[1] During the year ended December 31, 2021, the Group has sold all the shares of HL Greenpower Co., Ltd., FJ Composite Materials Co., LTD., WUXI CL New Energy Technology Ltd. and Combustion Synthesis Co., Ltd.

[2] During the year ended December 31, 2021, the Group newly acquired shares of PT.HLI Green Power for ₩209,132 million.

[3] During the year ended December 31, 2021, the Group newly acquired 40% shares of TL Chemical CO., Ltd. for ₩48,544 million.

11. Property, Plant and Equipment

Changes in property, plant and equipment for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021											
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Right-of-use assets	Construction-in-progress	Machinery-in-transit	Total
Beginning balance	1,772,039	4,821,014	985,190	7,573,016	9,920	645,341	185,213	112,295	230,854	3,886,682	345,911	20,567,475
Cost	1,808,991	5,794,729	1,677,231	18,812,951	36,372	1,579,923	511,358	413,150	348,412	3,968,793	345,911	35,297,821
Accumulated depreciation	-	(931,321)	(667,122)	(11,062,720)	(26,346)	(922,831)	(322,812)	(294,937)	(117,522)	-	-	(14,345,611)
Accumulated impairment	(36,952)	(42,394)	(24,919)	(177,215)	(106)	(11,751)	(3,333)	(5,918)	(36)	(82,111)	-	(384,735)
Business combination (Note 37)	69,872	84,333	3,336	77,349	1,089	4,501	1,255	-	7,482	911	-	250,128
Acquisitions/ transfer	30,821	590,203	351,122	4,472,368	5,501	361,060	148,227	181,304	217,014	6,025,137	129,251	12,512,008
Disposals/ transfer	(21,952)	(9,980)	(2,935)	(78,168)	(363)	(35,340)	(14,293)	-	(12,661)	(6,309,583)	(378,865)	(6,864,140)
Exchange differences	857	118,509	16,713	246,941	228	15,547	4,641	-	14,391	143,131	-	560,958
Depreciation	-	(157,125)	(71,822)	(1,916,345)	(3,164)	(218,880)	(62,609)	(107,642)	(79,871)	-	-	(2,617,458)
Impairment	-	(2,008)	(6,420)	(17,455)	-	(957)	(59)	-	-	(676)	(3,137)	(30,712)
Ending balance	1,851,637	5,444,946	1,275,184	10,357,706	13,211	771,272	262,375	185,957	377,209	3,745,602	93,160	24,378,259
Cost	1,888,589	6,604,140	2,048,100	23,410,612	41,694	1,840,714	605,971	490,049	535,460	3,828,841	93,160	41,387,330
Accumulated depreciation	-	(1,114,990)	(742,272)	(12,904,400)	(28,388)	(1,064,130)	(340,646)	(298,174)	(158,226)	-	-	(16,651,226)
Accumulated impairment	(36,952)	(44,204)	(30,644)	(148,506)	(95)	(5,312)	(2,950)	(5,918)	(25)	(83,239)	-	(357,845)

(in millions of Korean won)	2020											
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Right-of-use assets	Construction-in-progress	Machinery-in-transit	Total
Beginning balance	1,759,528	3,890,961	957,739	6,348,867	6,261	601,958	163,470	175,122	319,620	4,210,088	160,028	18,593,642
Cost	1,796,480	4,769,924	1,583,401	17,044,880	33,056	1,457,840	467,293	378,823	380,814	4,300,788	160,028	32,373,327
Accumulated depreciation	-	(839,904)	(609,282)	(10,486,289)	(26,648)	(843,955)	(301,041)	(197,978)	(61,119)	-	-	(13,366,216)
Accumulated impairment	(36,952)	(39,059)	(16,380)	(209,724)	(147)	(11,927)	(2,782)	(5,723)	(75)	(90,700)	-	(413,469)
Acquisitions/ transfer	14,436	1,137,678	106,976	3,243,373	6,365	282,554	87,682	39,256	109,307	5,168,221	258,957	10,454,805
Disposals/ transfer	(681)	(18,922)	(1,655)	(66,721)	(38)	(25,298)	(4,352)	(2,398)	(8,165)	(5,421,750)	(72,815)	(5,622,795)
Exchange differences	(1,244)	29,214	887	(63,136)	(192)	(873)	108	1	(1,353)	(55,703)	-	(92,291)
Depreciation	-	(145,120)	(60,365)	(1,510,695)	(2,390)	(190,550)	(51,930)	(99,491)	(70,534)	-	-	(2,131,075)
Impairment	-	(5,542)	(8,639)	(47,769)	(57)	(10,148)	(627)	(195)	(86)	(2,716)	(259)	(76,038)
Reversal of impairment	-	-	-	-	-	-	-	-	-	220	-	220
Transfer to assets held for sale	-	(67,255)	(9,753)	(330,903)	(29)	(12,302)	(9,138)	-	(117,935)	(11,678)	-	(558,993)
Ending balance	1,772,039	4,821,014	985,190	7,573,016	9,920	645,341	185,213	112,295	230,854	3,886,682	345,911	20,567,475
Cost	1,808,991	5,794,729	1,677,231	18,812,951	36,372	1,579,923	511,358	413,150	348,412	3,968,793	345,911	35,297,821
Accumulated depreciation	-	(931,321)	(667,122)	(11,062,720)	(26,346)	(922,831)	(322,812)	(294,937)	(117,522)	-	-	(14,345,611)
Accumulated impairment	(36,952)	(42,394)	(24,919)	(177,215)	(106)	(11,751)	(3,333)	(5,918)	(36)	(82,111)	-	(384,735)

During the year ended December 31, 2021, the Group capitalized ₩45,890 million of borrowing costs (2020: ₩46,992 million) in relation to acquisition of property, plant and equipment, on property, plant and equipment. The capitalization rate of borrowings used to determine the amount of borrowing costs eligible for capitalization is 1.32% (2020: 1.39%).

Line items including depreciation in the consolidated statements of profit or loss for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Cost of sales	2,368,588	1,897,393
Selling and administrative expenses	243,430	191,128
Others	1,024	2,250
Discontinued operations	4,416	40,304
Total	2,617,458	2,131,075

Lease

(i) Amounts recognized in the consolidated statement of financial position

The consolidated statement of financial position shows the following amounts relating to leases:

(in millions of Korean won)	**2021**	**2020**
Right-of-use assets[1]		
Real-estate	329,920	183,136
Machinery	23,258	26,541
Vehicles	21,475	17,026
Tools	2,083	3,535
Equipment	473	616
	377,209	230,854

[1] Included in the line item 'Property, plant and equipment' in the consolidated statements of financial position.

Additions to the right-of-use assets during the year ended December 31, 2021, were ₩217,014 million (2020: ₩109,307 million).

(in millions of Korean won)	**2021**	**2020**
Lease liabilities[1]		
Current	71,865	55,389
Non-current	247,380	129,236
	319,245	184,625

[1] Included in the line item 'borrowings' in the consolidated statements of financial position.

(ii) Amounts recognized in the consolidated statement of profit or loss

The consolidated statement of profit or loss shows the following amounts relating to leases:

(in millions of Korean won)	**2021**	**2020**
Depreciation of right-of-use assets		
Real-estate	57,959	50,449
Machinery	5,698	5,051
Vehicles	14,320	13,578
Tools	1,461	962
Equipment	433	494
	79,871	70,534
Interest expense relating to lease liabilities (included in finance cost)	8,671	9,578
Expense relating to short-term leases (included in cost of goods sold and administrative expenses)	27,051	30,164

Expense relating to leases of low-value assets that are not short-term leases (included in cost of goods sold and administrative expenses)	12,931	14,304
Expense relating to variable lease payments not included in lease liabilities (included in cost of goods sold and administrative expenses)	-	-

The total cash outflow for leases during the year ended December 31, 2021, was ₩124,438 million (2020: ₩97,774 million).

12. Intangible Assets

Changes in intangible assets for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**						
	Development costs	**Software**	**Industrial property rights**	**Goodwill**	**Memberships**	**Others**	**Total**
Beginning balance	55,857	466,358	604,661	887,037	31,589	234,415	2,279,917
Business combination (Note 37)	-	904	642	202,568	-	47,742	251,856
Separate acquisitions/ transfer	10	298,839	97,409	-	3,583	27,239	427,080
Additions – internal development	220	-	-	-	-	-	220
Disposals/transfer	-	(3,773)	(4,611)	(4,112)	(110)	(2,819)	(15,425)
Exchange differences	-	2,701	2,631	13,349	58	4,303	23,042
Amortization	(6,137)	(132,924)	(58,602)	-	-	(25,515)	(223,178)
Impairment	-	(60)	(404)	(294,918)	-	(3,467)	(298,849)
Transfer to assets held for sale (Note 34)	-	-	(360)	-	-	-	(360)
Ending balance	49,950	632,045	641,366	803,924	35,120	281,898	2,444,303

(in millions of Korean won)	2020						
	Development costs	**Software**	**Industrial property rights**	**Goodwill**	**Memberships**	**Others**	**Total**
Beginning balance	56,832	267,377	569,129	1,010,534	47,329	255,028	2,206,229
Separate acquisitions/ transfer	-	302,054	123,062	-	867	9,336	435,319
Additions – internal development	4,282	-	-	-	-	-	4,282
Disposals/transfer	-	(1,976)	(4,098)	-	(16,611)	(7,900)	(30,585)
Exchange differences	-	4,885	(864)	(11,711)	4	(32)	(7,718)
Amortization	(5,257)	(102,989)	(50,710)	-	-	(22,017)	(180,973)
Impairment	-	(26)	(26,735)	(111,786)	-	-	(138,547)
Transfer to assets held for sale (Note 34)	-	(2,967)	(5,123)	-	-	-	(8,090)
Ending balance	55,857	466,358	604,661	887,037	31,589	234,415	2,279,917

Line items including amortization of intangible assets for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Cost of sales	54,620	45,972
Selling and administrative expenses	168,398	134,365
Discontinued operations	160	636
Total	223,178	180,973

The Group recognized total research and development costs of ₩1,357,398 million (2020: ₩1,116,080 million) as expenses.

Details of greenhouse gas emission permits included in other intangible assets are as follows:

Greenhouse gas emission permits held for the purpose of fulfilling obligations

The number of greenhouse gas emission permits received at free of charge for the 3rd planning period (2021 to 2025) is as follows:

(in thousands of tons)	**2021**	**2022**	**2023**	**2024**	**2025**	**Total**
Allocation with nil consideration	9,405	9,430	9,430	9,343	9,343	46,951

Changes in greenhouse gas emission permits during the year ended December 31, 2021 and 2020, are as follows:

(in thousands of tons and millions of Korean won)	2021							
	2020		2021		2022		2023	
	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance /Allocation with nil consideration	8,666	-	9,405	-	9,430	-	9,430	-
Purchase/Sale	(69)	1,111	(54)	-	-	-	-	-
Exchange	100	-	(100)	-	-	-	-	-
Borrowings/Carry forwards between years	(49)	(388)	49	388	-	-	-	-
Surrendered to the government	(8,648)	(723)	-	-	-	-	-	-
Ending balance	-	-	9,300	388	9,430	-	9,430	-

(in thousands of tons and millions of Korean won)	2021					
	2024		2025		Total	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance / Allocation with nil consideration	9,343	-	9,343	-	55,617	-
Purchase/Sale	-	-	-	-	(123)	1,111
Exchange	-	-	-	-	-	-
Borrowings/Carry forwards between years	-	-	-	-	-	-
Surrendered to the government	-	-	-	-	(8,648)	(723)
Ending balance	9,343	-	9,343	-	46,846	388

(in thousands of tons and millions of Korean won)	2020							
	2019		2020		2021		2022	
	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance /Allocation with nil consideration	8,554	4,375	7,548	-	9,371	-	9,371	-
Purchase/Sale	138	3,525	-	-	-	-	-	-
Borrowings/Carry forwards between years	41	-	(41)	-	-	-	-	-
Surrendered to the government	(8,733)	(7,900)	-	-	-	-	-	-
Ending balance	-	-	7,507	-	9,371	-	9,371	-

(in thousands of tons and millions of Korean won)	2020							
	2023		2024		2025		Total	
	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance /Allocation with nil consideration	9,371	-	9,283	-	9,283	-	62,781	4,375
Purchase/Sale	-	-	-	-	-	-	138	3,525
Borrowings/Carry forwards between years	-	-	-	-	-	-	-	-
Surrendered to the government	-	-	-	-	-	-	(8,733)	(7,900)
Ending balance	9,371	-	9,283	-	9,283	-	54,186	-

During the year ended December 31, 2021 and 2020, there are no greenhouse gas emission permits held for short-term trading purpose.

Goodwill is allocated to the Group's CGUs identified for each operating segment. The carrying amounts of goodwill allocation by CGUs as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021						
	Acquisition of NanoH2O Co., Ltd.	Acquisition of FarmHannong Co., Ltd.	Acquisition of LG Life Sciences, Ltd.	Acquisition of Uniseal, Inc.	Acquisition of CEM business	Ohers	Total
Petrochemicals							
NCC	-	-	-	-	-	2,639	2,639
ABS	-	-	-	-	-	14,657	14,657
PO	-	-	-	-	-	1,054	1,054
PVC	-	-	-	-	-	808	808
Acrylic	-	-	-	-	-	25,572	25,572
Plasticizer	-	-	-	-	-	53	53
BPA	-	-	-	-	-	467	467
Others	-	-	-	-	-	1,350	1,350
Advanced Materials							
RO[1]	111,453	-	-	-	-	-	111,453
PSAA[2]	-	-	-	-	-	-	-
Separator[3]	-	-	-	-	203,344	-	203,344
Life Sciences							
Life sciences[4]	-	-	391,311	-	-	-	391,311
Common and others							
FarmHannong Co.,Ltd.	-	3,091	-	-	-	-	3,091
Adhesive[1]	-	-	-	48,125	-	-	48,125
Total	111,453	3,091	391,311	48,125	203,344	46,600	803,924

[1] Included changes resulting from foreign currency translation.
[2] During 2021, the Company has sold PSAA business.
[3] During 2021, the Company recognized goodwill in relation to the acquisition of CEM business.
[4] During 2021, the Company recognized ₩ 294,918 million of impairment against goodwill recognized in relation to the acquisition of LG Life Sciences, Ltd.

(in millions of Korean won)	2020						
	Acquisition of NanoH2O Co., Ltd.	**Acquisition of FarmHannong Co., Ltd.**	**Acquisition of LG Life Sciences, Ltd.**	**Acquisition of Uniseal, Inc.**	**Acquisition of Ugimag Korea Co., Ltd.**	**Ohers**	**Total**
Petrochemicals							
NCC	-	-	-	-	-	2,639	2,639
ABS	-	-	-	-	-	15,209	15,209
PO	-	-	-	-	-	1,054	1,054
PVC	-	-	-	-	-	808	808
Acrylic	-	-	-	-	-	25,572	25,572
Plasticizer	-	-	-	-	-	53	53
BPA	-	-	-	-	-	467	467
Others	-	-	-	-	-	1,350	1,350
Advanced Materials							
RO[1]	102,286	-	-	-	-	-	102,286
PSAA	-	-	-	-	-	4,112	4,112
Life Sciences							
Life sciences	-	-	686,229	-	-	-	686,229
Common and others							
FarmHannong Co.,Ltd.[2]	-	3,091	-	-	-	-	3,091
Adhesive[1,3]	-	-	-	44,167	-	-	44,167
Total	102,286	3,091	686,229	44,167	-	51,264	887,037

[1] Included changes resulting from foreign currency translation.
[2] Goodwill resulting from the acquisition of FarmHannong Co., Ltd. has been impaired and recognized as impairment losses for ₩83,765 million in 2020.
[3] Goodwill resulting from the acquisition of Uniseal, Inc. has been impaired and recognized as impairment losses for ₩28,021 million in 2020.

The recoverable amounts of CGUs have been determined based on value-in-use or fair value less cost of disposal calculations. Value-in-use calculations use pre-tax cash flow projections based on financial budgets approved by management covering a five-year period. Fair value less cost of disposal reflects expectation of future business and usage pattern of assets from the perspective of market participants. Management determined the estimated pre-tax cash flow based on past performance and its expectations of market development. Discount rates applied by the management are the pre-tax discount rates reflecting specific risks relating to the relevant operating segments. Taking into account the uncertainties relating to COVID-19, discount rate have been determined based on average values of input parameters (e.g. market risk premium) for longer observable period than before.

During 2021, key assumptions used for calculation of value in use and fair value less cost of disposal are as follows:

(in millions of Korean won)	2021	
	Pre-tax discount rate	**Growth rate for subsequent years after five years**
Acquisition of LG Petrochemical Co., Ltd.	9.0%	0.0%
Acquisition of SAP business	9.0%	0.0%
Acquisition of NanoH2O, Inc	10.6%	1.0%
Acquisition of FarmHannong	13.1%	1.0%
Acquisition of LG Life Sciences	12.8%	3.0%
Acquisition of Uniseal,Inc.	13.9%	2.0%
Consolidation of LG Chem(HUIZHOU) Petrochemical Co., Ltd	8.9%	0.0%

The results of the sensitivity analysis for the fair value less cost of disposal calculation of Life Sciences CGU are as follows:

(in millions of Korean won)	**0.5% Increase**	**0.5% Decrease**
Discount rate		
Increase(decrease) in fair value	(95,850)	109,362
Growth rate		
Increase(decrease) in fair value	69,525	(61,005)

Had the discount rate been 0.5% higher than the management's estimate, the Group should have recognized additional impairment loss of ₩95,850 million for the carrying value of goodwill. Also, had the growth rate been 0.5% lower than the management's estimate, the Group should have recognized additional impairment loss of ₩61,005 million for the carrying value of goodwill.

Impairment test on intangible assets other than goodwill

The impairment losses for intangible assets other than goodwill that the Group recognized during the year ended December 31, 2020, are as follows:

(in millions of Korean won)	2020			
	Development costs	**Industrial property rights**	**Other intangible assets**	**Total**
FarmHannong[1]	-	-	25,283	25,283
	-	-	25,283	25,283

[1] During 2020, the Group has performed impairment test for FarmHannong and recognized ₩25,283 million of impairment losses.

13. Other Current and Non-Current Assets

Details of other current and non-current assets as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Current		
Prepayments to suppliers and prepaid expenses	201,019	174,885
Prepaid value added tax	465,660	428,303
Others	82,353	39,964
Total	749,032	643,152
Non-current		
Net defined benefit assets	45,050	-
Long-term prepayments and long-term prepaid expenses	70,775	87,247
Others	96	98
Total	115,921	87,345

14. Borrowings

Borrowings as at December 31, 2021 and 2020, consist of:

(in millions of Korean won)	**2021**	**2020**
Current		
Short-term borrowings	1,688,383	879,757
Current portion of long-term borrowings of bank loans	1,056,963	341,203
Current-portion of debentures	659,869	272,466
Finance lease liabilities	71,865	55,389
	3,477,080	1,548,815
Non-current		
Long-term borrowings	3,628,563	3,131,254
Debentures	7,412,711	5,376,812
Lease liabilities	247,380	129,236
	11,288,654	8,637,302
Total	14,765,734	10,186,117

Details of short-term borrowings as at December 31, 2021 and 2020, are as follows:

General borrowings

(in millions of Korean won)	**Bank**	**Latest maturity date**	**Interest rate(%) as at December 31, 2021**	**2021**	**2020**
Bank loans	CITI and others	June 24, 2022	0.92 and others	1,237,430	879,757
Negotiated borrowings in foreign curreny[1]	Kookmin Bank and others	March 27, 2022	Libor + 0.30 and others	450,953	-
Total				1,688,383	879,757

[1] Accounted for as collateralized borrowings for trade receivables.

Details of long-term borrowings as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021				
	Bank	**Annual interest rate (%)**	**Amount in Korean won**	**Current**	**Non-current**
Borrowings in Korean won	KDB	3.05	300,000	-	300,000
	BOA	1.95	150,000	-	150,000
Borrowings in foreign currencies	HSBC	USD: 3M LIBOR + 1.40 CNY: PBOC ×0.95, LPR(5Y)-0.3375	8,313	8,313	-
	SMBC	USD : 1.3 EUR : 3M EURIBOR + 0.8, 0.32~0.48	451,478	10,076	441,402
	Construction Bank of China	PBOC ×0.90	8,305	8,305	-
	Agriculture Bank of China	LPR(1Y)+0.7	74,504	4,470	70,034
	CITI	EUR: 3M EURIBOR + 0.62~0.70 PLN: 3M Wibor+0.85	246,807	-	246,807
	ING	6M EURIBOR + 0.70 ~0.83	161,224	67,177	94,047
	EBRD	6M EURIBOR+0.62	322,448	67,177	255,271
	MUFG	6M EURIBOR + 0.60~0.80	134,354	67,177	67,177
	Industrial and Commercial Bank of China	PBOC ×1.00	39,666	14,785	24,881
	KEB Hana Bank	3M EURIBOR + 0.62	268,706	-	268,706
	KDB	USD: 3M LIBOR+ 0.77~0.95 EUR: 3M EURIBOR + 0.75~1.50	964,255	366,118	598,137
	The Export-Import Bank of Korea	3M EURIBOR + 0.75~1.50	517,479	295,577	221,902
	NongHyup Bank	3M EURIBOR + 0.75~1.50	258,739	147,788	110,951
	EIB	3M EURIBOR + 0.47	644,895	-	644,895
	DBS	6M EURIBOR + 0.60	134,353	-	134,353
Total			4,685,526	1,056,963	3,628,563

(in millions of Korean won)	2020				
	Bank	**Annual interest rate (%)**	**Amount in Korean won**	**Current**	**Non-current**
Borrowings in Korean won	KDB[1]	(1Y) + 1.45~1.99	6,622	1,597	5,025
	Kookmin Bank	24M MOR + 1.89	2,000	980	1,020
Borrowings in foreign currencies	HSBC	USD: 3M LIBOR + 0.95~1.40 CNY: PBOC ×0.95, LPR(5Y)-0.3375	87,806	60,541	27,265
	SMBC	3M LIBOR + 0.32~0.48	202,142	-	202,142
	Construction Bank of China	LPR(1Y)+0.36~0.46	81,673	35,315	46,358
	Communications Bank of China	PBOC ×1.00	5,676	5,676	-
	CITI	USD: 3M LIBOR + 0.95 EUR: EURIBOR +0.62~0.70	241,354	39,212	202,142
	ING	6M EURIBOR + 0.70 ~0.83	161,714	-	161,714
	Standard Chartered Bank	USD: 3M LIBOR + 1.20 CNY: PBOC ×0.95	92,036	79,514	12,522
	CNOOC Finance	PBOC ×0.90	10,018	10,018	-
	EBRD	6M EURIBOR+0.62	336,903	-	336,903
	Bank of China	3M LIBOR +1.15	5,475	5,475	-
	MUFG	EUR:3M EURIBOR + 0.60~0.80	134,761	-	134,761
	Industrial and Commercial Bank of China	PBOC ×1.00	46,024	10,473	35,551
	CIMB	3M LIBOR + 1.50	49,021	49,021	-
	KEB Hana Bank	3M EURIBOR + 0.62	269,523	-	269,523
	KDB	USD: 3M LIBOR + 0.93 EUR: 6M EURIBOR +1.50	513,380	43,381	469,999
	The Export-Import Bank of Korea	6M EURIBOR + 1.50	296,475	-	296,475
	NongHyup Bank	6M EURIBOR + 1.50	148,238	-	148,238
	EIB	3M EURIBOR + 0.47	646,855	-	646,855
	DBS	6M EURIBOR + 0.60	134,761	-	134,761
Total			3,472,457	341,203	3,131,254

[1] Manufacturing facilities are pledged as collaterals for the above long-term borrowings (Note 18).

Details of debentures as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)		2021				
	Financial institution	**Annual interest rate (%)**	**Latest maturity date**	**Amount in Korean won**	**Current**	**Non-current**
50-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.28	2022.5.19	400,000	400,000	-
50-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.53	2024.5.19	280,000	-	280,000
51-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.88	2023.2.20	240,000	-	240,000
51-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.07	2025.2.20	270,000	-	270,000
51-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.29	2028.2.20	300,000	-	300,000
52-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.02	2022.3.13	160,000	160,000	-
52-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.11	2024.3.13	240,000	-	240,000
1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.21	2026.3.13	200,000	-	200,000
52-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.40	2029.3.13	400,000	-	400,000
53-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.57	2023.2.19	350,000	-	350,000
53-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.65	2025.2.19	250,000	-	250,000
53-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.72	2027.2.19	50,000	-	50,000
53-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.91	2030.2.19	250,000	-	250,000
54-1st Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	1.14	2024.2.19	350,000	-	350,000
54-2nd Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	1.51	2026.2.19	270,000	-	270,000
54-3rd Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	1.76	2028.2.19	200,000	-	200,000
54-4th Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	2.14	2031.2.19	260,000	-	260,000
54-5th Debenture (non-guaranteed/public)	KB Securities Co., Ltd and others	2.22	2036.2.19	120,000	-	120,000
USD foreign currency debenture with maturity in 2024	Citi and others	3.25	2024.10.15	592,750	-	592,750
USD foreign currency debenture with maturity in 2029	Citi and others	3.63	2029.4.15	592,750	-	592,750
EUR foreign currency debenture with maturity in 2023	Citi and others	0.50	2023.4.15	671,170	-	671,170
5Y USD Green Bond (non-guaranteed/private)	Citi Securities and others	1.38	2026.7.7	592,750	-	592,750
10Y USD Green Bond (non-guaranteed/private)	Citi Securities and others	2.38	2031.7.7	592,750	-	592,750
1-2nd EUR Overseas Exchangeable bonds[1]	Credit Suisse	-	2021.1.14	-	-	-

(in millions of Korean won)

		2021				
	Financial institution	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
Debentures in Korean won (non-guaranteed)	NH Investment & Securities Co., Ltd.	2.26	2022.2.16	100,000	100,000	-
	NH Investment & Securities Co., Ltd.	3.00	2023.3.02	40,000	-	40,000
	NH Investment & Securities Co., Ltd.	1.95	2023.2.14	80,000	-	80,000
	NH Investment & Securities Co., Ltd.	2.22	2025.2.14	30,000	-	30,000
	NH Investment & Securities Co., Ltd.	1.56	2024.2.08	70,000	-	70,000
55-1st Debenture (non-guaranteed/private)	KB Securities Co., Ltd and others	2.39	2031.5.7	90,000	-	90,000
55-2nd Debenture (non-guaranteed/private)	KB Securities Co., Ltd and others	2.52	2036.5.7	60,000	-	60,000
Less: discount on debentures				(29,590)	(131)	(29,459)
Total				8,072,580	659,869	7,412,711

(in millions of Korean won)

		2020				
	Financial institution	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
50-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.28	2022.5.19	400,000	-	400,000
50-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.53	2024.5.19	280,000	-	280,000
51-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.56	2021.2.20	190,000	190,000	-
51-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.88	2023.2.20	240,000	-	240,000
51-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.07	2025.2.20	270,000	-	270,000
51-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.29	2028.2.20	300,000	-	300,000
52-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.02	2022.3.13	160,000	-	160,000
52-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.11	2024.3.13	240,000	-	240,000
52-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.21	2026.3.13	200,000	-	200,000
52-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.40	2029.3.13	400,000	-	400,000
53-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.57	2023.2.19	350,000	-	350,000
53-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.65	2025.2.19	250,000	-	250,000
53-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.72	2027.2.19	50,000	-	50,000
53-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.91	2030.2.19	250,000	-	250,000
USD foreign currency debenture with maturity in 2024	Citi and others	3.25	2024.10.15	544,000	-	544,000
USD foreign currency debenture with maturity in 2029	Citi and others	3.63	2029.4.15	544,000	-	544,000

(in millions of Korean won)		2020				
	Financial institution	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
EUR foreign currency debenture with maturity in 2023	Citi and others	0.50	2023.4.15	669,120	-	669,120
1-1st USD Overseas Exchangeable bonds[1,2]	Credit Suisse	-	2020.10.7	-	-	-
1-2nd EUR Overseas Exchangeable bonds[1,3]	Credit Suisse	-	2021.1.14	32,787	32,787	-
Debentures in Korean won (non-guaranteed)	NH Investment & Securities Co., Ltd.	2.26	2022.2.16	100,000	-	100,000
	NH Investment & Securities Co., Ltd.	2.71	2021.3.02	50,000	50,000	-
	NH Investment & Securities Co., Ltd.	3.00	2023.3.02	40,000	-	40,000
	NH Investment & Securities Co., Ltd.	1.95	2023.2.14	80,000	-	80,000
	NH Investment & Securities Co., Ltd.	2.22	2025.2.14	30,000	-	30,000
Less: discount on debentures				(20,629)	(321)	(20,308)
Total				5,649,278	272,466	5,376,812

[1] As the conditions for the execution of call options have been satisfied during the year ended December 31, 2020, exchangeable bonds of USD 219,800,000 were exchanged with 509,113 treasury shares and the remaining exchangeable bonds of USD 200,000 have been early repaid on October 7, 2020. Also, exchangeable bonds of EUR 290,700,000 were exchanged with 714,856 treasury shares. During the year ended December 31, 2021, exchangeable bonds of EUR 22,300,000 were additionally exchanged with 54,834 treasury shares and the remaining exchangeable bonds of EUR 2,200,000 have been early repaid.

[2] Details of 1-1st USD overseas exchangeable bonds are as follows:

	Details
Aggregate principal amount	USD 220,000,000
Issue price	USD 220,000,000
Coupon rate (%)	0.00
Issue date	April 16, 2018
Maturity date	April 16, 2021
Redemption	- Redemption at maturity: Outstanding bond principal, which is not repaid early or which call option is not exercised on, is repaid at maturity as a lump sum. - Prepayment: The issuer has a call option.
Underlying shares	509,606 registered ordinary shares (treasury shares)
Exchange price (Korean won/shares)	460,000
Exchange period	From May 27, 2018 to April 6, 2021
Call option by the issuer	- Share price (based on closing price) is higher than 130% of exchange price for more than 20 trading days during 30 consecutive trading days in a row, after 1 year from the closing date. - The amount of outstanding bonds is less than 10% in aggregate principal amount of the bonds originally issued (clean up call). - As a result of changes relating to tax laws in Korea, the issuer becomes obliged to pay any additional amounts.

Call option by bondholders	- The shares cease to be listed or admitted to trading or are suspended for a period equal to or exceeding 30 consecutive trading days. - The occurrence of a change of control

[3] Details of 1-2nd EUR overseas exchangeable bonds are as follows:

	Details
Aggregate principal amount	EUR 315,200,000
Issue price	EUR 315,200,000
Coupon rate (%)	0.00
Issue date	April 16, 2018
Maturity date	April 16, 2021
Redemption	- Redemption at maturity: Outstanding bond principal, which is not repaid early or which call option is not exercised on, is repaid at maturity as a lump sum. - Prepayment: The issuer has a call option.
Underlying shares	775,128 registered ordinary shares (treasury shares)
Exchange price (Korean won/shares)	533,600
Exchange period	From May 27, 2018 to April 6, 2021
Call option by the issuer	- Share price (based on closing price) is higher than 130% of exchange price for more than 20 trading days during 30 consecutive trading days in a row, after 1 year from the closing date. - The amount of outstanding bonds is less than 10% in aggregate principal amount of the bonds originally issued (clean up call). - As a result of changes relating to tax laws in Korea, the issuer becomes obliged to pay any additional amounts.
Call option by bondholders	- The shares cease to be listed or admitted to trading or are suspended for a period equal to or exceeding 30 consecutive trading days. - The occurrence of a change of control

Details of lease liabilities as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**				
Leaser	**Annual interest rate (%)**	**Latest maturity date**	**Total amount**	**Current**	**Non-current**
Hyundai Oil Bank and others	1.98 ~ 3.01	2068.3.31	319,245	71,865	247,380

(in millions of Korean won)	**2020**				
Leaser	**Annual interest rate (%)**	**Latest maturity date**	**Total amount**	**Current**	**Non-current**
Hyundai Oil Bank and others	1.98 ~ 3.01	2068.3.31	184,625	55,389	129,236

15. Provisions

Changes in provisions for other liabilities and charges for the years ended December 31, 2021 and 2020, as follows:

(in millions of Korean won)	2021				
	Warranty[1]	**Greenhouse gas emission**[2]	**Legal claims**[3]	**Restoration**[4]	**Total**
Beginning balance	1,244,017	4,875	8,286	112,829	1,370,007
Business Combination (Note 38)	2,406	-	-	-	2,406
Additions (reversal)	1,477,429	(4,072)	14,013	14,186	1,501,556
Used	(613,672)	(724)	(6,657)	(43,208)	(664,261)
Ending balance	2,110,180	79	15,642	83,807	2,209,708
Less: current portion	(1,532,356)	(79)	-	(40,320)	(1,572,755)
Total	577,824	-	15,642	43,487	636,953

(in millions of Korean won)	2020				
	Warranty[1]	**Greenhouse gas emission**[2]	**Legal claims**[3]	**Restoration**[4]	**Total**
Beginning balance	596,251	25,157	370	114,950	736,728
Additions (reversal)	942,425	(12,382)	8,885	22,112	961,040
Used	(294,659)	(7,900)	(969)	(24,233)	(327,761)
Ending balance	1,244,017	4,875	8,286	112,829	1,370,007
Less: current portion	(1,000,312)	(4,875)	-	(36,264)	(1,041,451)
Total	243,705	-	8,286	76,565	328,556

[1] Warranty provisions have been accrued based on historical experience for the estimated warranty costs to be incurred due to quality control, exchange, refunds with regard to products. In addition, provisions related to replacement costs for ESS and voluntary automotive battery recalls are determined based on the best estimate and included in the above warranty provision. The provisions are adjusted to reflect the current best estimate. As at December 31, 2021, the above warranty provision included ₩2,103,880 million of warranty provision for LG Energy Solution, Ltd. and its subsidiaries.

[2] Greenhouse gas emission provisions have been accrued for estimated expenditures to be obligated for any excess emission. The estimated emission as at December 31, 2021 amounts to 8,266 thousand tons (December 31, 2020: 8,437 thousand tons).

[3] Lawsuit provisions have been accrued for certain pending cases.

[4] As at December 31, 2021, restoration provisions have been accrued for the estimated expenses to restore land pollutions and others.

16. Net Defined Benefit Liabilities

Details of net defined benefit liabilities recognized in the consolidated statements of financial position as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Present value of defined benefit obligations[1]	1,616,781	1,454,596
Fair value of plan assets	(1,643,709)	(1,336,637)
Liabilities in the consolidated statement of financial position	(26,928)	117,959

[1] The present value of retirement benefit obligations is net of existing contributions to the National Pension Plan of ₩708 million as at December 31, 2021 (2020: ₩734 million).

The amounts recognized in the consolidated statements of profit or loss for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Current service cost[1]	191,482	196,654
Interest cost	2,059	4,006
Total, included in employee benefit expenses	193,541	200,660

[1] The above amounts excluded ₩2,456 million (2020: ₩5,622 million) of expenses capitalized to construction in progress and development costs.

Post-employment benefits recognized for defined contribution plan for the year ended December 31, 2021, amounted to ₩9,533 million (2020: ₩8,109 million).

Post-employment benefits recognized in the consolidated statements of profit or loss for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Cost of sales	118,525	131,628
Selling and administrative expenses	84,241	74,762
Discontinued operations	308	2,379
Total	203,074	208,769

Movements in the present value of defined benefit obligations for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Beginning balance	1,454,596	1,343,553
Increase in defined benefit obligations due to business combination	54,897	-
Transfer in	39,334	7,190
Transfer out	(8,314)	(1,690)
Current service cost	193,938	202,276
Interest expense	37,257	31,313
Remeasurements:		
Actuarial loss from change in demographic assumptions	4,586	7,943
Actuarial gain from change in financial assumptions	(76,261)	(28,735)
Actuarial loss (gain) from experience adjustments	9,142	(10,239)
Others	11,336	617
Exchange differences	(4,600)	(13,820)
Payments from plans	(99,130)	(83,812)
Ending balance	1,616,781	1,454,596

Movements in the fair value of plan assets for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Beginning balance	1,336,637	1,164,393
Increase in plan assets due to business combination	45,275	-
Transfer in	1,135	-
Transfer out	(1,238)	(725)
Interest income	35,198	27,307
Remeasurements:		
Return on plan assets (excluding amounts included in interest income)	(13,326)	(5,069)
Contributions:		
Employers	332,299	227,555
Payments from plans	(89,445)	(76,458)
Administrative costs	(2,826)	(366)
Ending balance	1,643,709	1,336,637

The actual return on plan assets for the year ended December 31, 2021, was ₩21,872 million (2020: ₩22,238 million).

The significant actuarial assumptions as at December 31, 2021 and 2020, are as follows:

	2021	**2020**
Discount rate	2.9% ~ 3.0%	2.4% ~ 2.5%
Salary growth rate	5.0%	4.0% ~ 5.0%

The sensitivity analysis for changes in key actuarial assumptions as at December 31, 2021, is as follows:

(in millions of Korean won)	**Increase by 0.5%**	**Decrease by 0.5%**
Discount rate:		
Increase (decrease) in defined benefit obligations	(126,031)	143,559
Salary growth rate:		
Increase (decrease) in defined benefit obligations	139,400	(124,631)

A decrease in corporate bond yields may lead most significantly to an increase in defined benefit liabilities.

The above sensitivity analyses are based on a change in an assumption while holding all other assumptions constant. In practice, this is unlikely to occur, and changes in some of the assumptions may be correlated. The sensitivity of the defined benefit obligation to changes in principal actuarial assumptions is calculated using the projected unit credit method, the same method applied when calculating the defined benefit obligations recognized on the statement of financial position.

The methods and types of assumptions used in preparing the sensitivity analysis did not change compared to the prior period.

Plan assets as at December 31, 2021 and 2020, consist of:

(in millions of Korean won)	**2021**		**2020**	
	Amount	**Composition (%)**	**Amount**	**Composition (%)**
Insurance contracts with guaranteed yield	1,629,239	99.1	1,314,072	98.3
Equity linked bonds	12,988	0.8	20,855	1.6
Time deposits	1,482	0.1	1,710	0.1
	1,643,709	100.0	1,336,637	100.0

Plan assets consist of various debt instruments with principal and interest protection and others which have no quoted market prices in an active market.

The weighted average duration of the defined benefit obligation is 12.62 years.

The Group reviews the funding level on an annual basis and has a policy of eliminating deficit from the fund. Expected contributions to post-employment benefit plans for the year ending December 31, 2021, are ₩160,568 million.

17. Other Current and Non-Current Liabilities

Details of other current and non-current liabilities as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Current		
Advances from customers	373,356	203,507
Withholdings	143,600	128,754
Unearned revenues	104,121	62,286
Accrued expenses	699,592	393,482
Total	1,320,669	788,029
Non-current		
Long-term accrued expenses	73,880	63,019
Long-term unearned revenues	99,169	14,952
Long-term advanced received	16,829	68,935
Total	189,878	146,906

18. Commitments and Contingencies

(1) The Parent Company is jointly and severally liable for liabilities of LG Energy Solution, Ltd. as at December 1, 2020, a newly established company through the split-off from the Parent Company.

(2) As at December 31, 2021, the Parent Company and certain subsidiaries have been guaranteed from Seoul Guarantee Insurance Company for the execution of contracts and others.

(3) As at December 31, 2021, the Parent Company and certain subsidiaries have various specific line of credit agreements with several financial institutions, as follows:

(*unit: Korean won in millions, foreign currencies in millions*)

Classification	**The Parent Group**		**Certain Overseas Subsidiaries**						
	KRW	**USD**	**KRW**	**USD**	**CNY**	**EUR**	**PLN**	**INR**	**THB**
Limit of bank overdraft	20,400		8,700	228	2,000	104	-	-	10
Limit of the letter of credit	22,000	336	-	345	2,224	-	-	763	-
Limit of discount of notes from export	-	452	-	731	2,900	-	-	-	-
Limit of guaranteed payments in other foreign currency	-	181	-	122	400	-	-	-	-
Limit of loan arrangements	800,000	760	268,000	3,369	3,631	2,865	155	4,521	-
Forward foreign exchange	-	-	-	118	-	-	-	-	-
Limit of other loans	-	-	-	70	-	-	-	-	-

The Group also entered into comprehensive credit line agreements with other financial institutions relating to trade finance and import/export amounting to ₩20,000 million (including bank overdraft of ₩5,000 million) and USD 300 million. Certain subsidiaries entered into factoring agreements with limit of KRW 230,000 million and USD 175 million.

(4) As at December 31, 2021, the Parent Company and certain subsidiaries have B2B purchase arrangements with several financial institutions with limit of ₩227,000 million and ₩150,000 million, respectively.

(5) As at December 31, 2021, the Parent Company has reverse factoring agreements, and utilized the facility for ₩171,760 million provided by Shinhan Card and utilized the facility for ₩130,186 million provided by Woori Card.

(6) As at December 31, 2021, in connection with styrene monomer gas leakage accident, several lawsuits against LG Polymer India Pvt. Ltd., a subsidiary, have been filed with National Green Tribunal of India (NGT) and Andhra Pradesh High Court (APHC). The ultimate outcome of these cases cannot be determined at the reporting date. LG Polymer India Pvt. Ltd deposited INR 500 million under the order from NGT, and deposited INR 814 million generated from sales of inventories, under the order from APHC in connection with this accident. The manufacturing facility is currently closed with limited access in accordance with the order from APHC.

(7) As at December 31, 2021, in relation to price fixing of mobile batteries, the consumers in Israel have filed one class action against the Parent Company and certain overseas subsidiaries. However, the ultimate outcome of these cases cannot be determined at the reporting date.

(8) As at December 31, 2021, in relation to General Motors (GM) Bolt EV, the class action against General Motors (GM) Bolt EV including the Group is still pending. However, the ultimate outcome of the case cannot be determined at the reporting date.

(9) In addition, as at December 31, 2021, the Parent Company and certain subsidiaries have been named as a plaintiff in 9 and 20 legal actions, respectively, involving ₩29,979 million and ₩10,127 million in claims, respectively. They have been named as a defendant in 13 and 151 legal actions, respectively, with ₩43,095 million and ₩3,856 million in claims, respectively. The ultimate outcome of these cases cannot be determined at the reporting date.

(10) As at December 31, 2021, the Parent Company is under investigation by the related authorities in relation to the manipulation of the emission of fine dust-causing substance in the Yeosu Industrial Complex, and the final outcome of these investigations cannot be determined at the reporting date. As at December 31, 2021, the Parent Company shut down the relevant production facilities.

(11) The Parent Company has entered into manufacture and production technical contracts with ExxonMobil and others.

(12) The Parent Company has entered into a license agreement with LG Corp. to use trademarks on the products that the Group manufactures and sells, and on the services the Group provides in relation to its business.

(13) As at December 31, 2021, the Parent Company has entered into payment guarantee contract of USD 150 million, and certain subsidiaries have entered into payment guarantee contracts of USD 25 million, EUR 2 million and ₩7,755 million with financial institutions to guarantee the warrant of certain installed products. Also, certain subsidiaries have entered into payment guarantee contract of CNY 280 million with financial institutions in relation to custom of imported raw materials.

(14) As at December 31, 2021 and 2020, assets pledged as collateral for the borrowings are as follows:

(in millions of Korean won)	2021			
	Secured amount	**Borrowings / Loan**	**Limit**	**Secured party**
Factory	-	Current and non-current borrowings	-	KDB
	-		-	

The collateral provided for a subsidiary has been removed due to the disposal of the subsidiary during the year ended December 31, 2021.

(in millions of Korean won)	2020			
	Secured amount	**Borrowings / Loan**	**Limit**	**Secured party**
Factory	20,880	Current and non-current borrowings	6,622	KDB
	20,880		6,622	

(15) Capital expenditure arrangement that has not incurred at the end of the reporting period is as follows:

(in millions of Korean won)	**2021**	**2020**
Property, plant and equipment	3,822,461	2,428,411

(16) As of December 31, 2021, the Group has entered into an agreement with General Motors (GM) regarding joint investment in Ultium Cells LLC, whereby each party can sell its shares to third parties in 8 years after the inception of the contract. In addition, if one party defaults, the other party has the right to purchase shares from the other party. The Group completed the process of approval by the government for the use of core technologies according to the Industrial Technology Protection Act.

(17) As of December 31, 2021, Stellantis , the Group's customer, has recalled Chrysler PHEV vehicles over a potential fire risk. There has been no confirmed root cause of fires in the Stellantis vehicles that are subject to the recall.

19. Share Capital

Changes in share capital and share premium for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won and in shares)	Ordinary shares		Preferred shares		
	Number of shares	Share capital	Number of shares	Share capital	Share premium
January 1, 2020	70,592,343	352,962	7,688,800	38,444	2,014,036
December 31, 2020	70,592,343	352,962	7,688,800	38,444	2,014,036
December 31, 2021	70,592,343	352,962	7,688,800	38,444	2,014,036

Changes in treasury shares for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won and in shares)	Number of shares		Carrying amount	Gain on disposal of treasury shares
	Ordinary shares	Preferred shares		
January 1, 2020	1,652,417	16,367	354,945	13,855
Treasury shares reduction due to the exercise of exchange rights	(1,187,575)	-	(319,246)	417,865
Others	-	1		
December 31, 2020	464,842	16,368	35,699	431,720
Treasury shares reduction due to the exercise of exchange rights	(91,228)	-	(14,302)	28,344
Disposal of treasury shares[1]	(6,085)	(10,327)	(3,386)	3,744
December 31, 2021	367,529	6,041	18,011	463,808

[1] After the exchange of exchangeable bonds, all of the remaining treasury shares purchased in early 2017 due to the exercise of share purchase rights by the dissenting shareholders who objected to the merger with LG Life Sciences, Ltd. have been disposed of.

20. Retained Earnings

Retained earnings as at December 31, 2021 and 2020, consist of:

(in millions of Korean won)	2021	2020
Legal reserve[1]	540,492	401,574
Discretionary reserve[2]	12,945,537	13,780,609
Retained earnings before appropriation	4,605,920	993,121
Total	18,091,949	15,175,304

[1] The Commercial Code of the Republic of Korea requires the Parent Company to appropriate for

each financial period, as a legal reserve, an amount equal to a minimum of 10% of cash dividends paid until such reserve equals 50% of its issued share capital. The reserve is not available for cash dividends payment, but may be transferred to share capital or used to reduce accumulated deficit. When the accumulated legal reserves (the sum of capital reserves and earned profit reserves) are greater than 1.5 times the paid-in capital amount, the excess legal reserves may be distributed in accordance with a resolution of the shareholders' meeting.

[2] The Group separately accumulates a discretionary reserve for research and human resource development through appropriation of retained earnings, which has been included as deductible expense for the corporate income tax return according to the Special Tax Treatment Law. Among these reserves, the used amounts for each specific purpose and the balances after use can be transferred to discretionary reserve and wll be able used for dividends.

21. Other Components of Equity

Details of other components of equity as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Treasury shares (Note 19)	(18,011)	(35,699)
Capital transactions within the Group[1]	(19,299)	(19,299)
Total	(37,310)	(54,998)

[1] Includes gain or loss on disposal of investments and investment differences due to changes in equity, net of deferred tax.

22. Selling and Administrative Expenses

Selling and administrative expenses for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Wages and salaries	1,233,911	942,273
Post-employment benefits (Note 16)	84,241	74,762
Employee benefits	241,853	196,180
Travel expense	44,418	34,492
Water & utilities	69,364	56,135
Packaging expense	7,826	7,134
Rental expenses	124,487	87,943
Commission expenses	905,359	690,666
Depreciation	244,726	192,289
Advertising expense	39,055	27,413
Freight expenses	936,075	598,042
Training expense	28,373	16,012
Amortization (Note 12)	168,398	134,365
Sample expense	20,953	21,472
Development costs	255,150	217,778
Others	1,788,655	1,215,172
Total	6,192,844	4,512,128

23. Breakdown of Expenses by Nature

Cost of sales, and selling and administrative expenses by nature for the years ended December 31, 2021 and 2020, consist of:

(in millions of Korean won)	**2021**	**2020**
Changes in inventories of merchandise, finished goods, semi-finished goods and work in process	(1,600,081)	(361,876)
Raw materials and consumables used	24,101,478	16,780,471
Purchase of merchandise	1,386,674	1,258,024
Employee benefit expenses (Note 24)	3,577,932	2,899,535
Advertising expenses	40,404	28,463
Freight expenses	980,393	636,678
Commission expenses	1,532,813	1,121,416
Depreciation and amortization	2,836,332	2,270,019
Rent expenses and usage fee	82,591	59,613
Other expenses	4,690,720	3,561,170
Total	37,629,256	28,253,513

24. Employee Benefit Expenses

Details of employee benefit expenses for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Salaries	3,047,389	2,419,496
Post-employment benefits – Defined benefit plan (Note 16)	193,233	198,404
Post-employment benefits – Defined contribution plan (Note 16)	9,533	7,986
Others	327,777	273,649
Total	3,577,932	2,899,535

25. Finance Income and Costs

Details of finance income and costs for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Finance income		
Interest income[1]	75,745	35,924
Dividend income	7,376	289
Exchange differences	368,489	377,350
Gain on derivative instruments	203,344	-
Others	31,730	3,898
Total	686,684	417,461
Finance costs		
Interest expense[2]	211,002	198,155
Exchange differences	441,274	585,307
Loss on derivative instruments	8,104	325,417
Others	409	-
Total	660,789	1,108,879

[1] Details of interest income for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Deposits held by financial institutions	31,222	24,973
Other loans and receivables	44,523	10,951
Total	75,745	35,924

[2] Details of interest expense for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Interest on financial institutions	45,600	48,846
Interest on lease liabilities	8,671	9,578
Interest on debentures	166,433	149,987
Other interest expenses	36,188	36,808
Capitalized interest for qualifying assets	(45,890)	(47,064)
Total	211,002	198,155

26. Other Non-Operating Income

Details of other non-operating income for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Exchange differences	699,130	762,310
Gain on disposal of property, plant and equipment	36,207	3,452
Gain on disposal of intangible assets	5,266	104
Gain on disposal of investments in associates (Note 10)	8,152	312,080
Insurance income	62,648	9,046
Others	91,752	68,137
Total	903,155	1,155,129

27. Other Non-Operating Expenses

Details of other non-operating expenses for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Exchange differences	584,233	925,073
Loss on disposal of property, plant and equipment	65,022	80,763
Loss on disposal of intangible assets	2,358	1,776
Impairment loss on property, plant and equipment (Note 11)	29,362	73,964
Impairment loss on intangible assets (Note 12)	298,849	138,484
Loss on disposal of investments in associates	2,054	-
Donations	17,308	13,627
Others	58,069	93,129
Total	1,057,255	1,326,816

28. Tax Expense and Deferred Tax

Details of income tax expense for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Current tax on profit for the years	1,735,744	119,273
Adjustments in respect of prior years	20,296	6,287
Deferred tax - movement in temporary differences	(424,316)	433,353
Deferred tax – tax credit carryforwards	(20,096)	(12,578)
	1,311,628	546,335
Deferred tax charged directly to equity	17,534	(7,882)
Current tax charged directly to equity	(13,304)	(185,744)
Others	(80,068)	15,130
Income tax expense	1,235,790	367,839

The aggregate current and deferred tax charged directly to equity (other comprehensive income) for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Current tax		
Gain on disposal of financial assets at fair value through other comprehensive income	138	(5,262)
Gain on disposal of treasury shares	(13,442)	(180,482)
Total	(13,304)	(185,744)
Deferred tax		
Remeasurements of net defined benefit liabilities	(10,717)	(6,640)
Loss on valuation of derivative instruments	6,459	(674)
Exchange differences on translation of foreign operations	25,003	(4,998)
Gain (loss) on valuation of financial assets at fair value through other comprehensive income	(3,211)	4,430
Total	17,534	(7,882)

Movements in deferred tax assets (liabilities) for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)

	2021						
		Increase (decrease)					
	Beginning balance	Business combination	Profit (loss) for the year	Other comprehen-sive income	Others	Exchange differences	Ending balance
Net defined benefit liabilities	388,609	-	19,942	3,122	-	7	411,680
Plan assets	(366,060)	-	(67,235)	(13,839)	-	-	(447,134)
Provision for impairment on receivables	429	-	(286)	-	-	18	161
Property, plant and equipment	175,014	(2,156)	(53,526)	-	(2,820)	4,167	120,679
Intangible assets	(41,541)	(1,695)	2,561	-	5,521	210	(34,944)
Investments in subsidiaries, associates and joint ventures	(86,544)	-	(15,333)	-	4,764	-	(97,113)
Accrued income	(255)	-	50,248	-	3	(744)	49,252
Others	602,492	-	466,834	3,248	3,434	22,092	1,098,100
	672,144	(3,851)	403,205	(7,469)	10,902	25,750	1,100,681
Exchange differences on translation of foreign operations	(2,837)	-	-	25,003	2,537	-	24,703
Tax credit carryforwards	15,250	-	20,096	-	1,388	29	36,763
Tax loss carryforwards	35,383	-	3,577	-	(10,072)	251	29,139
Deferred tax assets (liabilities)	719,940	(3,851)	426,878	17,534	4,755	26,030	1,191,286

(in millions of Korean won)

	2020						
		Increase (decrease)					
	Beginning balance	Business combination	Profit (loss) for the year	Other comprehen-sive income	Others	Exchange differences	Ending balance
Net defined benefit liabilities	358,940	-	29,572	115	-	(18)	388,609
Plan assets	(317,845)	-	(48,231)	16	-	-	(366,060)
Provision for impairment on receivables	1,106	-	(693)	-	-	16	429
Property, plant and equipment	116,316	-	19,514	-	36,498	2,686	175,014
Intangible assets	(42,115)	-	574	-	-	-	(41,541)
Investments in subsidiaries, associates and joint ventures	(30,109)	-	(56,435)	-	-	-	(86,544)
Accrued income	(218)	-	(36)	-	-	(1)	(255)
Others	271,183	-	(356,171)	(3,015)	694,776	(4,281)	602,492
	357,258	-	(411,906)	(2,884)	731,274	(1,598)	672,144
Exchange differences on translation of foreign operations	2,161	-	-	(4,998)	-	-	(2,837)
Tax credit carryforwards	20,687	-	12,578	-	(16,775)	(1,240)	15,250
Tax loss carryforwards	84,688	-	(13,565)	-	(34,234)	(1,506)	35,383
Deferred tax assets (liabilities)	464,794	-	(412,893)	(7,882)	680,265	(4,344)	719,940

The reconciliations between income tax expense and accounting profit for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021	2020
Profit before income tax expense[1]	5,266,838	1,106,549
Tax at domestic tax rates applicable to profits in the respective countries[2]	1,487,382	495,467
Tax effects of:	(251,592)	(127,628)
Income not subject to tax	(34,084)	(36,733)
Expenses not deductible for tax purposes	107,755	29,198
Unrecognized deferred income tax for temporary differences in the current year	(115,428)	749,185
Tax credit	(304,633)	(173,716)
Others	94,798	(695,562)
Income tax expense	1,235,790	367,839
Effective tax rate (income tax expense/profit before income tax)	23.46%	33.24%

[1] The amount before regarding profit from discontinued operations

[2] The weighted average applicable tax rate on profit before income tax for the year ended December 31, 2021, is 28.24% (2020: 44.78%).

Realization of deferred tax assets is dependent on the Group's ability to generate future taxable profits in excess of the profits arising from the reversal of taxable temporary differences, and economic and industry outlooks. Management periodically reviews on these factors.

Details of deductible (taxable) temporary differences unrecognized as deferred tax assets (liabilities) as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**	
Investments in subsidiaries, associates and joint ventures	(104,860)	(161,065)	Permanently re-invested income not distributed as dividend
	5,582,080	5,737,439	No possibility of disposal
Goodwill	(424,726)	(694,422)	
Land	373	488	
Unused tax loss carryforwards	333,647	345,652	Uncertainty of future tax income

The maturity of unused loss is as follows:

(in millions of Korean won)	**Less than 1 year**	**Between 1-2 years**	**Between 2-5 years**	**Over 5 years**
2021 Tax loss carryforwards	21	3,154	9,961	451,065
2020 Tax loss carryforwards	165	2,497	14,501	480,651

29. Earnings per Share

Basic earnings per share is calculated by dividing the profit attributable to the owners of the Parent Company by the weighted average number of shares in issue excluding shares purchased by the Parent Company and held as treasury shares. As at the reporting date, the Parent Company has no potential ordinary shares. Preferred shares have a right to participate in the profits of the Group. These participation rights have been considered in presenting the earnings per share information for the both of ordinary shares and preferred shares.

Basic earnings per share for profit from continuing operations and earnings per share attributable to the owners of the Parent Company for the years ended December 31, 2021 and 2020, are computed as follows:

Basic earnings per ordinary share from continuing operations

(in millions of Korean won and in number of shares)	**2021**	**2020**
Profit from continuing operations attributable to ordinary shares[1]	3,038,302	372,308
Weighted average number of ordinary shares outstanding[2]	70,218,611	69,177,128
Basic earnings per ordinary share from continuing operations *(in won)*	43,269	5,382

Basic earnings per ordinary share

(in millions of Korean won and in number of shares)	**2021**	**2020**
Profit attributable to ordinary shares[1]	3,307,880	461,109
Weighted average number of ordinary shares outstanding[2]	70,218,611	69,177,128
Basic earnings per ordinary shares *(in won)*	47,108	6,666

Basic earnings per preferred share from continuing operations

(in millions of Korean won and in number of shares)	**2021**	**2020**
Profit from continuing operations attributable to preferred share[1]	332,443	41,676
Weighted average number of preferred shares outstanding[2]	7,674,271	7,672,433
Basic earnings per preferred share from continuing operations *(in won)*	43,319	5,432

Basic earnings per preferred share

(in millions of Korean won and in number of shares)	**2021**	**2020**
Profit attributable to preferred shares[1]	361,906	51,525
Weighted average number of preferred shares outstanding[2]	7,674,271	7,672,433
Basic earnings per preferred shares *(in won)*	47,158	6,716

[1] Profit attributable to ordinary and preferred shares are as follows:

(in millions of Korean won)	**2021**	**2020**
Profit from continuing operations attributable to the owners of the Parent Company	3,370,745	413,984
Ordinary shares dividends (A)	842,623	691,771
Preferred shares dividends (B)	92,475	77,108
Undistributed earnings from continuing operation for the period	2,435,647	(354,895)
Undistributed earnings available for ordinary shares (C)	2,195,679	(319,463)
Undistributed earnings available for preferred shares (D)	239,968	(35,432)
Profit from continuing operations for the period attributable to ordinary shares (A+C)	3,038,302	372,308
Profit from continuing operations for the period attributable to preferred shares (B+D)	332,443	41,676

(in millions of Korean won)	**2021**	**2020**
Profit attributable to the owners of the Parent Company	3,669,787	512,634
Ordinary shares dividends (A)	842,624	691,771
Preferred shares dividends (B)	92,475	77,108
Undistributed earnings for the period	2,734,688	(256,245)
Undistributed earnings available for ordinary shares (C)	2,465,257	(230,662)
Undistributed earnings available for preferred shares (D)	269,431	(25,583)
Profit for the period attributable to ordinary shares (A+C)	3,307,880	461,109
Profit for the period attributable to preferred shares (B+D)	361,907	51,525

[2] Weighted average numbers of shares are calculated as follows:

	2021			
Ordinary shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2021. 1. 1 – 2021 12. 31	70,163,895	365	25,609,821,675
	2021. 10. 28 – 2021. 12. 31	6,085	65	395,525
Conversion of treasury shares	2021. 1. 9 – 2021. 12. 31	54,834	357	19,575,738
Total				25,629,792,938

Weighted average number of ordinary shares outstanding: 25,629,792,938 / 365 = 70,218,611 shares

	2021			
Preferred shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2021. 1. 1 - 2021. 12. 31	7,672,432	365	2,800,437,680
	2021. 10. 28 – 2021. 12. 31	10,327	65	671,255
Total				2,801,108,935

Weighted average number of preferred shares outstanding: 2,801,108,935 / 365 = 7,674,271 shares

	2020			
Ordinary shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2020. 1. 1 – 2020 12. 31	68,939,926	366	25,232,012,916
Conversion of treasury shares	2020. 8. 1 - 2020. 12. 31	47,277	153	7,233,381
	2020. 9. 1 - 2020. 12. 31	446,115	122	54,426,030
	2020. 10. 1 - 2020. 12. 31	16,212	92	1,491,504
	2020. 11. 1 - 2020. 12. 31	50,658	61	3,090,138
	2020. 12. 1 - 2020. 12. 31	663,707	31	20,574,917
Total				25,318,828,886

Weighted average number of ordinary shares outstanding: 25,318,828,886 / 366 = 69,177,128 shares

	2020			
Preferred shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2020. 1. 1 - 2020. 12. 31	7,672,433	366	2,808,110,478
Total				2,808,110,478

Weighted average number of preferred shares outstanding: 2,808,110,478 / 366 = 7,672,433 shares

For the years ended December 31, 2021 and 2020, the Parent Company did not calculate diluted earnings per share due to anti-dilutive effect.

Basic and diluted earnings per share attributable to ordinary and preferred shares from discounted operations for the years ended December 31, 2021 and 2020, are as follows:

(in Korean won)	**2021**	**2020**
Basic earnings per ordinary share from discounted operations	3,839	1,284
Basic earnings per preferred share from discounted operations	3,839	1,284
Diluted earnings per ordinary share from discounted operations	3,839	1,284
Diluted earnings per preferred share from discounted operations	3,839	1,284

30. Dividends

Details of dividends of the Parent Company as at December 31, 2021 and 2020, are as follows:

	2021	**2020**
Number of shares entitled to dividends: shares issued and outstanding (par value per share: ₩5,000)		
Ordinary shares	70,224,814	70,127,501
Preferred shares	7,682,759	7,672,432
Dividend per share *(in Korean won, %)*		
Ordinary shares: cash	12,000 (240%)	10,000 (200%)
Preferred shares: cash	12,050 (241%)	10,050 (201%)
Cash dividends to distribute *(in millions of Korean won)*		
Ordinary shares	842,698	701,275
Preferred shares	92,577	77,108
	935,275	778,383

Dividend payout ratios of the Parent Company for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Dividends (A)	935,275	778,383
Profit attributable to the owners of the Parent Company (B)	3,669,787	512,634
Dividend payout ratio (A/B)	25.48%	41.98%

Dividend yield ratios of the Parent Company for the years ended December 31, 2021 and 2020, are as follows:

	2021		**2020**	
(in Korean won)	**Ordinary shares**	**Preferred Shares**	**Ordinary shares**	**Preferred Shares**
Dividend per share (A)	12,000	12,050	10,000	10,050
Market value at the end of year (B)[1]	628,500	298,875	808,750	377,375
Dividend yield ratio (A/B)	1.91%	4.03%	1.24%	2.66%

[1] Average price in the stock market during one week preceding two business days before shareholder list closing date for the general shareholders' meeting.

31. Related Party Transactions

As at December 31, 2021 and 2020, LG Corp. is an entity exercising a significant influence over the Group, which owns 33.34% of the Parent Company's ordinary shares.

Details of associates and other related parties that have sales and other transactions with the Group or have receivables and payables balances as at December 31, 2021 and 2020, are as follows, and the details of investments in subsidiaries, associates and joint ventures are described in Note 1.3:

Related party	Related party's subsidiary (Domestic)	Related party's subsidiary (Overseas)	Details
S&I Corp.	S&I CM	S&I CM NANJING Co., Ltd. and others	Subsidiary of LG Corp.
LG CNS Co., Ltd.	Biz Tech Partners Co., Ltd. and others	LG CNS America Inc. and others	Subsidiary of LG Corp.
LG Management Development Institute	-	-	Subsidiary of LG Corp.
LG Sports Ltd.	-	-	Subsidiary of LG Corp.
LG Holdings Japan	-	-	Subsidiary of LG Corp.
LG Display Co., Ltd.	-	LG Display (China) Co., Ltd. and others	LG Enterprise group[1]
LG Electronics Inc.	LG Innotek Co., Ltd. and others	Inspur LG Digital Mobile Communications Co., Ltd. and others	LG Enterprise group[1]
LX International Corp.	LX Pantos Co., Ltd. and others	LX International (Japan) Ltd. and others	LG Enterprise group[1]
LX Hausys, Ltd.	-	LX Hausys Tianjin Co., Ltd. and others	LG Enterprise group[1]
LG Household & Health Care Ltd.	Coca-Cola Beverage Co. and others	-	LG Enterprise group[1]
LX Semicon Co., Ltd.	-	-	LG Enterprise group[1]
LX MMA Corporation[2]	-	-	LG Enterprise group[1]
LG Uplus Corp.	LG HelloVision Corp.	-	LG Enterprise group[1]
G Ⅱ R Inc.	HS AD Inc.	Beijing Yuanzhimeng Advertising Co., Ltd.	LG Enterprise group[1]

[1] Although these entities are not the related parties of the Group in accordance with K-IFRS 1024, these entities belong to a large enterprise group in accordance with the Monopoly Regulation and Fair Trade Act.

[2] During the year ended December 31, 2021, due to the spin-off of LG Corp., its shares were transferred to LX Holdings Corp., a new company, and then the classification criteria for related parties have been changed.

Sales and purchases with related parties for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021					
		Purchase and others				
	Sales and others	Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Acquisition of right-of-use assets	Interest expense	Others
Entity with a significant influence over the Group						
LG Corp.	12	-	-	11,866	139	89,480
Associates and joint ventures						
SEETEC Co., Ltd.	66,149	180,001	654	94	419	69,220
TECWIN Co., Ltd.	10	182	5,513	-	-	192
HL Greenpower Co., Ltd. [1]	470,525	440	-	-	-	-
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	804	161,775	-	-	-	33
Others	26,727	10,949	-	-	-	2,697
Other related parties						
S&I Corp. and its subsidiaries	445	17,392	575,567	-	-	135,895
LG CNS Co., Ltd. and its subsidiaries	13,919	5,076	540,690	1,192	14	194,814
Others	156	-	-	-	-	32,485
Others						
LG Display Co., Ltd. and its subsidiaries	634,886	151	-	-	15	21
LG Electronics Inc. and its subsidiaries[2]	1,170,195	918,280	312,448	-	98	597,519
LX International Corp. and its subsidiaries	96,336	609,316	28,546	-	1	939,085
LX Hausys, Ltd. and its subsidiaries	281,017	5,169	31,951	-	-	681
LX MMA Corporation[3]	159,877	191,431	-	-	-	4,408
Others	10,943	34,215	2,590	9	63	9,144
Total	2,932,001	2,134,377	1,497,959	13,161	749	2,075,674

(in millions of Korean won)

	2020					
		Purchase and others				
	Sales and others	Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Acquisition of right-of-use assets	Interest expense	Others
Entity with a significant influence over the Group						
LG Corp.	14	-	-	-	167	60,718
Associates and joint ventures						
SEETEC Co., Ltd.	56,396	135,799	10	618	86	78,908
TECWIN Co., Ltd.	25	318	4,662	-	-	211
HL Greenpower Co., Ltd.	853,423	-	-	-	-	3,530
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	-	857	-	-	-	-
Others	54	3,821	-	-	-	2,482
Other related parties						
LX MMA Corporation[3]	84,486	136,506	-	-	-	3,320
S&I Corp. and its subsidiaries	337	30,472	618,098	-	-	87,470
LG CNS Co., Ltd. and its subsidiaries	13,156	4,524	397,358	-	16	107,325
Others	14	-	-	583	2	16,470
Others						
LG Display Co., Ltd. and its subsidiaries	861,285	98	879	891	6	314
LG Electronics Inc. and its subsidiaries	1,187,949	822,786	326,358	1,910	10	110,628
LX International Corp. and its subsidiaries	57,992	324,691	148,452	1,181	4	465,694
LX Hausys, Ltd. and its subsidiaries	171,063	1,861	5,665	-	1	6,227
Others	7,847	22,830	2,236	1,605	29	6,960
Total	3,294,041	1,484,563	1,503,718	6,788	321	950,257

[1] This entity has been excluded from the related parties since the Company sold its shares in 2021. Transactions with this entity until the sale of shares have been included in the above information.
[2] The consideration transferred for the acquisition of CEM business has been included in other purchase from LG Electronics Inc. and its subsidiaries (Note 38).
[3] Net sales and purchase amounts after offsetting for Raffinate transactions with LX MMA Corporation.

Balances of receivables and payables arising from sales and purchases of goods and services as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)

	2021			
	Receivables			
	Trade receivables and others	Loan receivables	Other receivables	Total
Entity with a significant influence over the Group				
LG Corp.	-	-	9,983	9,983
Associates and joint ventures				
SEETEC Co., Ltd.	7,426	-	462	7,888
TECWIN Co., Ltd.	-	-	-	-
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	-	-	-	-
Others	463	-	4,586	5,049
Other related parties				
S&I Corp. and its subsidiaries[1]	388	-	8,762	9,150
LG CNS Co., Ltd. and its subsidiaries	5,632	-	326	5,958
Others	-	-	6,739	6,739
Others				
LG Display Co., Ltd. and its subsidiaries	110,826	-	935	111,761
LG Electronics Inc. and its subsidiaries[2]	270,116	-	25,438	295,554
LX International Corp. and its subsidiaries	2,676	-	-	2,676
LX Hausys, Ltd. and its subsidiaries	58,934	-	55	58,989
LX MMA Corporation	20,754	-	625	21,379
Others	23	-	1,773	1,796
Total	477,238	-	59,684	536,922

(in millions of Korean won)

	2021				
	Payables				
	Trade payables	Borrowings	Lease liabilities	Other payables	Total
Entity with a significant influence over the Group					
LG Corp.	-	-	11,866	23,609	35,475
Associates and joint ventures					
SEETEC Co., Ltd.	17,164	-	24,653	10,310	52,127
TECWIN Co., Ltd.	317	-	-	16,116	16,433
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	48,054	-	-	-	48,054
Others	-	-	-	410	410
Other related parties					
S&I Corp. and its subsidiaries[1]	-	-	-	282,691	282,691
LG CNS Co., Ltd. and its subsidiaries	233	-	1,192	316,160	317,585
Others	-	-	-	715	715
Others					
LG Display Co., Ltd. and its subsidiaries	32	-	595	2,942	3,569
LG Electronics Inc. and its subsidiaries[2]	59,289	-	18,694	148,185	226,168
LX International Corp. and its subsidiaries	18,467	-	-	182,716	201,183
LX Hausys, Ltd. and its subsidiaries	-	-	-	5,501	5,501
LX MMA Corporation	15,960	-	-	-	15,960
Others	3,226	-	3,479	8,583	15,288
Total	162,742	-	60,479	997,938	1,221,159

(in millions of Korean won)

	2020			
	Receivables			
	Trade receivables and others	Loan receivables	Other receivables	Total
Entity with a significant influence over the Group				
LG Corp.	-	-	12,420	12,420
Associates and joint ventures				
SEETEC Co., Ltd.	3,820	-	201	4,021
TECWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	277,326	-	-	277,326
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	-	-	-	-
Others	-	-	22	22
Other related parties				
LX MMA Corporation	3,186	-	534	3,720
S&I Corp. and its subsidiaries[1]	6	-	8,783	8,789
LG CNS Co., Ltd. and its subsidiaries	7,048	-	85	7,133
Others	606	-	4,360	4,966
Others				
LG Display Co., Ltd. and its subsidiaries	152,152	-	27,792	179,944
LG Electronics Inc. and its subsidiaries[2]	245,176	-	111,549	356,725
LX International Corp. and its subsidiaries	4,710	-	-	4,710
LX Hausys, Ltd. and its subsidiaries	34,977	-	31	35,008
Others	128	-	1,163	1,291
Total	729,135	-	166,940	896,075

(in millions of Korean won)

	2020				
	Payables				
	Trade payables	Borrowings	Lease liabilities	Other payables	Total
Entity with a significant influence over the Group					
LG Corp.	-	-	11,934	4,013	15,947
Associates and joint ventures					
SEETEC Co., Ltd.	14,977	-	26,014	9,884	50,875
TECWIN Co., Ltd.	-	-	-	6,105	6,105
HL Greenpower Co., Ltd.	-	-	-	330	330
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD.	70	-	-	-	70
Others	124	-	-	272	396
Other related parties					
LX MMA Corporation	13,272	-	-	-	13,272
S&I Corp. and its subsidiaries[1]	30	-	-	265,647	265,677
LG CNS Co., Ltd. and its subsidiaries	4	-	1,206	164,632	165,842
Others	-	-	92	289	381
Others					
LG Display Co., Ltd. and its subsidiaries	-	-	703	115	818
LG Electronics Inc. and its subsidiaries[2]	133,330	-	1,792	254,868	389,990
LX International Corp. and its subsidiaries	23,654	-	575	74,267	98,496
LX Hausys, Ltd. and its subsidiaries	-	-	-	3,965	3,965
Others	1,869	-	1,101	6,224	9,194
Total	187,330	-	43,417	790,611	1,021,8

[1] Other receivables to S&I Corp. include the amount of deposits which are classified as memberships in the financial statements of the Group.

[2] The warranty provision related to the recall of GM Bolt is not included in the above receivables and payables.

Fund transactions with related parties for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)

	2021						
				Loans		Borrowings[1]	
	Dividends received	Dividends paid	Equity contributions in cash (capital reduction)	Loans	Repayment	Borrowings	Repayment
Entity with a significant influence over the Group							
LG Corp.	-	235,342	-	-	-	11,866	11,956
Associates and joint ventures							
SEETEC Co., Ltd.	10,000	-	-	-	-	94	8,017
LG Vina Chemical	334	-	-	-	-	-	-
TL Chemical CO., Ltd	-	-	48,544	-	-	-	-
PT. HLI Greenpower [2]	-	-	209,132	-	-	-	-
Other related parties	-	-		-	-	-	-
LG CNS Co., Ltd.						1,192	3,471
LG Holdings Japan Co.,Ltd.	-	-	-	-	-	-	91
Others	-	-	-	-	-		
LG Display America,Inc.							149
Pantos Logistics France	-	-	-	-	-	-	419
Pantos Logistics Spain S.L.	-	-	-	-	-	-	161
LG Electronics Deutschland GmbH	-	-	-	-	-	-	286
LG ELECTRONICS WROCLAW SP. Z O.O.	-	-	-	-	-	17,673	231
LX Hausys, Ltd.	-	-	-	-	-	-	571
LG HOUSEHOLD & HEALTH CARE LTD	-	-	-	-	-	9	1,579
Total	10,334	235,342	257,676	-	-	30,834	26,931

(in millions of Korean won)

	2020						
				Loans		Borrowings[1]	
	Dividends received	Dividends paid	Equity contributions in cash (capital reduction)	Loans	Repayment	Borrowings	Repayment
Entity with a significant influence over the Group							
LG Corp.	-	47,068	-	-	-	167	14,699
Associates and joint ventures							
SEETEC Co., Ltd.	10,000	-	-	-	-	86	3,506
TECWIN Co., Ltd.	314	-	-	-	-	-	-
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO.,Ltd	-	-	22,191	-	-	-	-
WUXI CL New Energy Technology	-	-	(1,178)	-	-	-	-
Other related parties							
LG CNS Co., Ltd.	-	-	-	-	-	16	1,190
LG Holdings Japan Co.,Ltd.	-	-	-	-	-	583	482
Others							
LG Display America,Inc.	-	-	-	-	-	891	85
Pantos Logistics (China) Co., Ltd.	-	-	-	-	-	-	21
Pantos Logistics France	-	-	-	-	-	854	415
Pantos Logistics Spain S.L.	-	-	-	-	-	328	159
LG Electronics Deutschland GmbH	-	-	-	-	-	1,910	4,390
LG Hausys, Ltd.	-	-	-	-	-	56	8
LG HOUSEHOLD & HEALTH CARE LTD	-	-	-	-	-	29	697
Total	10,314	47,068	21,013	-	-	4,920	25,652

[1] The amounts represent lease liabilities that were recognized or repaid for the year ended December 31, 2021.
[2] The entity name has been changed from PT. HKML Battery Indonesia to PT. HLI Greenpower for the year ended December 31, 2021.

Compensation for key management of the Group for the years ended December 31, 2021 and 2020, consists of:

(in millions of Korean won)	2021	2020
Short-term employee benefits	108,507	92,430
Post-employment benefits	19,714	7,005
Total	128,221	99,435

Key management includes directors and audit committee members having duties and responsibilities over planning, operations and controlling of the Group's business activities.

There are no provisions recognized against receivables from related parties as at December 31, 2021 and 2020; therefore, there are no impairment losses recognized against the receivables from related parties for the years ended December 31, 2021 and 2020.

As at December 31, 2021, there are no payment guarantees provided by the Group for related parties.

32. Cash Flows

Cash generated from operations for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Profit before income tax	5,266,838	1,106,548
Profit before income tax from continuing operations	4,890,652	951,597
Profit before income tax from discontinued operations	376,186	154,951
Adjustments for:		
Depreciation	2,617,730	2,129,986
Amortization	223,178	180,973
Post-employment benefits	193,541	200,660
Finance income	(416,499)	(55,302)
Finance costs	457,412	790,030
Foreign exchange differences	(29,881)	10,363
Loss (gain) on valuation of inventories	113,954	(7,756)
Gain on disposal of property, plant and equipment	(44,466)	(17,506)
Gain on disposal of intangible assets	(5,266)	(104)
Gain on disposal of other assets	-	(2,771)
Loss on disposal of property, plant and equipment	65,072	81,402
Loss on disposal of intangible assets	2,401	1,776
Reversal of impairment loss on property, plant and equipment	-	(220)
Impairment loss on property, plant and equipment	29,925	76,037
Impairment loss on intangible assets	298,849	138,547
Impairment loss on other assets	-	23
Gain on disposal of investments in associates	(6,098)	(312,080)
Gain on disposal of business	(371,125)	(32,085)
Additions to provisions	1,501,556	961,040
Other income	66,748	10,668
Increase in inventories	(2,816,268)	(565,687)
Increase in trade receivables	(653,921)	(3,181,776)
Increase in other receivables	(567,365)	(142,121)
Decrease (increase) in other current assets	(27,789)	53,343
Settlement of derivative instrument transactions	-	(733)
Increase in trade payables	289,248	3,651,513
Increase in other payables	1,512,613	1,583,217
Increase in other current liabilities	267,640	340,058
Decrease in provisions	(664,261)	(319,861)
Decrease in net defined benefit liabilities	(308,035)	(228,316)
Other cash flows from operations	(38,552)	76,778
Cash generated from operations	6,957,179	6,526,644

Changes in liabilities arising from financial activities for the year ended December 31, 2021, are as follows:

(in millions of Korean won)	2021						
	At January 1, 2021	**Cash flows from financing activities**	**Lease liabilities**	**Amortization**	**Reclassification of current portion**	**Others**	**At December 31, 2021**
Short-term borrowings	1,276,349	(28,019)	-	-	1,206,091	362,790	2,817,211
Long-term borrowings	3,260,490	1,854,965	200,308	-	(1,206,091)	(233,729)	3,875,943
Debentures	5,649,278	2,293,691	-	6,646	-	122,965	8,072,580
Exchange rights	16,797	-	-	-	-	(16,797)	-
Other payables for the reverse factoring arrangement	2,081,307	(3,565,365)	-	-	-	1,783,703	299,645
Total	12,284,221	555,272	200,308	6,646	-	2,018,932	15,065,379

The significant non-cash transactions for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Reclassification of construction-in-progress	6,309,583	5,421,750
Reclassification of machinery-in-transit	378,865	72,815
Reclassification of long-term borrowings into current portion	1,865,862	1,662,047
Other payables related to acquisitions of property, plant and equipment and intangible assets	2,041,805	1,786,346
Reclassification of other payables under the reverse factoring arrangement	1,783,703	2,802,825
Exchange of treasury stocks such as exchangeable bonds	54,383	917,592
Transfer of non-current assets held for sale	-	777,695
Transfer of non-current liabilities held for sale	-	130,383

33. Segment Information

General information about the Group's reportable segments is as follows:

Segment	Products or services	Major customers
Petrochemicals[1]	ABS, PC, PE, PP, Acrylic, Alcohol, SAP, PVC, Synthetic rubber, Special resin, BPA, Ethylene, Propylene and others	LG Electronics Inc., OCI Group Co. Ltd., Mitsubishi Corp. and others
LG Energy Solution[2]	Mobile batteries, Automotive batteries, Electricity storage batteries and others	Hewlett-Packard Co., General Motors Corp., and others
Advanced materials[1]	Automotive components, LCD Photoresist, OLED materials, Battery materials and others	LG Display Co., Ltd., Samsung Display Co., Ltd., BOE, AUO and others
Life sciences[1]	Growth hormone, Vaccine, Antidiabetic, agricultural chemicals and others	HUADONG NINGBO, UNICEF, Intervet and others
Common and others[1]	Crop protection products, Seeds, Fertilizers, General management, sales and R&D and others	National Agriculture Cooperative Federation and others

[1] Certain divisions have been regrouped to reflect the reorganization of the Group. The information for the comparative period has been recast to reflect these changes.
[2] During the year ended December 31, 2020, LG Energy Solution was established through the split-off of battery business segment from the LG Chem, Ltd.

The segment information on revenue, profit and loss for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021					
	Petro-chemicals	**LG Energy Solution**	**Advanced materials**	**Life sciences**	**Common and others[3]**	**Total**
Total segment revenue	20,759,589	17,820,701	4,792,356	760,357	854,972	44,987,975
Inter-segment revenue	584,097	16,838	1,589,375	70,011	72,932	2,333,253
Revenue from external customers[1]	20,175,492	17,803,863	3,202,981	690,346	782,040	42,654,722
Operating profit (loss)[2]	4,081,476	771,121	235,900	66,991	(130,022)	5,025,466

(in millions of Korean won)	2020					
	Petro-chemicals	**LG Energy Solution**	**Advanced materials**	**Life sciences**	**Common and others[3]**	**Total**
Total segment revenue	14,176,847	12,363,633	3,792,986	653,463	768,454	31,755,383
Inter-segment revenue	540,198	109	1,047,274	3,086	105,844	1,696,511
Revenue from external customers[1]	13,636,649	12,363,524	2,745,712	650,377	662,610	30,058,872
Operating profit (loss)[2]	1,936,413	(165,634)	203,003	53,746	(222,169)	1,805,359

[1] Revenue from external customers consists of sales of goods. Interest income and dividend income are included in finance income.
[2] Management assesses the performance of the operating segments based on a measurement of operating profit of segment.
[3] Common and other segments include operating segments not qualifying as a reportable segment, supporting divisions as well as R&D divisions.

The segment information on assets and liabilities as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won	2021					
	Petro-chemicals	**LG Energy Solution**	**Advanced materials**	**Life sciences**	**Common and others**	**Total**
Reportable segment asset[1]	15,297,794	23,728,448	4,972,040	1,576,987	5,560,033	51,135,302
Investments in associates and joint ventures	62,024	225,567	93,835	17	153,867	535,310
Reportable segment liability[1]	5,016,619	14,980,391	1,406,698	220,954	6,300,652	27,925,314

(in millions of Korean won	2020					
	Petro-chemicals	**LG Energy Solution**	**Advanced materials**	**Life sciences**	**Common and others**	**Total**
Reportable segment asset[1]	11,668,671	19,577,416	3,137,926	1,928,129	5,076,752	41,388,894
Investments in associates and joint ventures	6,604	48,350	89,525	17	164,833	309,329
Reportable segment liability[1]	3,544,622	12,024,260	1,182,052	211,806	5,635,714	22,598,454

[1] Assets and liabilities are measured in a manner consistent with those in the financial statements, and allocated on the basis of segment operation.

The external sales and non-current assets by geographical segments from continuing operations for the years ended December 31, 2021 and 2020, and as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**Sales**		**Non-current assets[1]**	
	2021	**2020**	**2021**	**2020**
Korea[2]	10,164,222	8,270,238	16,157,398	14,656,257
China	12,130,895	8,913,290	4,688,935	3,690,486
Asia	5,178,242	3,283,064	147,809	34,876
America	4,309,768	2,601,486	1,692,631	656,190
Europe	10,351,454	6,662,579	4,192,086	3,859,016
Others	520,141	328,215	-	-
Total	42,654,722	30,058,872	26,878,859	22,896,825

[1] Represents aggregate amount of property, plant and equipment, intangible assets and investment properties.
[2] Domestic sales include the exports made through local letters of credit.

There is no single external customer who contributes over 10% of the Group's revenue for the years ended December 31, 2021 and 2020.

34. Assets and Liabilities Held for Sale and Discontinued Operations

34.1 Assets and Liabilities Held for Sale

Upon the approval of management, the Group decided to dispose of six lines of small pouch assembly facilities and others (June 2019), acrylic film business (December 2020), LCD polarizer business (June 2020). As a result, the related assets and liabilities were reclassified as assets and liabilities held for sale. The disposal of acrylic film business and land acquired as part of acquisition of Farm Hannong Co., Ltd. is expected to be completed in the first half of FY2022. The disposal of LCD polarizer business, small pouch assembly facility business have been completed in February 2021, June 2021, respectively.

Details of assets and liabilities of disposal group classified as held for sale as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Assets of disposal group		
Inventories	-	185,693
Property, plant and equipment	5,364	570,374
Intangible assets	-	8,086
Others	-	24,919
Total	5,364	789,072
Liabilities of disposal group		
Borrowings and others	-	130,383
Total	-	130,383

Assets of the disposal group were measured at net fair value immediately before the initial classification as assets as held for sale and there are no other non-operating expenses (income) recognized from the measurement for the years ended December 31, 2021 and 2020.

34.2 Discontinued Operations

The Group decided to discontinue Glass substrate business with the resolution of the Board of Directors in January 2020 and substantially discontinued the related business as of March 2020. In addition, the Group decided to dispose of LCD polarizer business with the resolution of the Board of Directors in June 2020, and the disposal has been completed in February 2021. The Group disposed of all of its shares of Ugimag Korea Co., Ltd., in July 2021. Accordingly, the profit and loss from the related operations are presented as discontinued operations and the comparative consolidated statements of profit or loss have been recast.

Comprehensive income information from discontinued operation for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021			
	LCD polarizer	**Glass substrate**	**Ugimag**	**Total**
Revenue	614,306	10,026	11,609	635,941
Expense	(210,869)	(8,230)	(40,656)	(259,755)
Gain (loss) before income tax of discontinued operation	403,437	1,796	(29,047)	376,186
Income tax benefits (expense)	(85,496)	(443)	8,795	(77,144)
Gain (loss) after income tax of discontinued operations	317,941	1,353	(20,252)	299,042

(in millions of Korean won)	2020			
	LCD polarizer	**Glass substrate**	**Ugimag**	**Total**
Revenue	1,312,590	43,901	17,761	1,374,252
Expense	(1,109,989)	(83,646)	(25,666)	(1,219,301)
Gain (loss) before income tax of discontinued operation	202,601	(39,745)	(7,905)	154,951
Income tax benefits (expense)	(64,213)	7,912	-	(56,301)
Gain (loss) after income tax of discontinued operations	138,388	(31,833)	(7,905)	98,650

Net cash flows from discontinued operations for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021			
	LCD polarizer	**Glass substrate**	**Ugimag**	**Total**
Net cash inflow (outflow) from operating activities	231,214	(7,266)	6,022	229,970
Net cash inflow from investing activities	1,277,759	10,923	27,964	1,316,646
Net cash outflow from financing activities	(1,521,473)	(3,657)	(33,985)	(1,559,115)

(in millions of Korean won)	2020			
	LCD polarizer	**Glass substrate**	**Ugimag**	**Total**
Net cash inflow (outflow) from operating activities	216,331	(3,963)	9,039	221,407
Net cash inflow (outflow) from investing activities	119,019	33,111	(1,499)	150,631
Net cash outflow from financing activities	(323,171)	(29,148)	(7,540)	(359,859)

35. Assets and Liabilities related to Contracts with Customers

Assets and liabilities related to contracts with customers as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Contract assets	-	-
Total contract assets	-	-
Contract liabilities		
Advances in relation to revenue from the Group's main business activities	376,487	265,688
Expected services to be transferred	-	-
Expected customer incentives	5,636	5,394
Unearned revenue	167,151	26,036
Total contract liabilities	549,274	297,118

Revenue recognized in relation to contract liabilities

The following table shows how much of the revenue recognized in the current reporting period relates to carried-forward contract liabilities and how much relates to performance obligations that were satisfied in the prior periods.

(in millions of Korean won)	**2021**	**2020**
Revenue recognized in the current period from the contract liabilities balance at the beginning of the period	205,125	179,431
Advances in relation to revenue from the Group's main business activities	200,987	162,509
Unearned revenue	4,138	13,422
Expected services to be transferred	-	3,500
Revenue recognized from performance obligations satisfied in previous periods	-	-

36. Investment Properties

Details of investment properties as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021				2020			
	Cost	Accumulated depreciation	Accumulated impairment	Book amount	Cost	Accumulated depreciation	Accumulated impairment	Book amount
Land	4,211	-	-	4,211	4,211	-	-	4,211
Buildings	65,542	(13,409)	(47)	52,086	54,457	(9,225)	(10)	45,222
Total	69,753	(13,409)	(47)	56,297	58,668	(9,225)	(10)	49,433

Changes in investment properties for the years ended December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	2021			2020		
	Land	Building	Total	Land	Building	Total
Beginning balance	4,211	45,222	49,433	4,368	48,960	53,328
Acquisitions/transfers	-	8,233	8,233	-	2,644	2,644
Disposals/transfers	-	(73)	(73)	(157)	(5,221)	(5,378)
Depreciation	-	(1,296)	(1,296)	-	(1,161)	(1,161)
Ending balance	4,211	52,086	56,297	4,211	45,222	49,433

The fair value of investment properties is measured either by independent professional appraisers with certified qualification or measured based on official appraised value of land and available information from recent transactions of similar properties, and it is classified as 'level 3' of the fair value hierarchy. The fair value of investment properties as at December 31, 2021, is ₩66,861 million (2020: ₩51,625 million).

Rental income from investment properties under operating lease is ₩6,752 million (2020: ₩6,819 million), and operating expenses incurred for investment properties that generated rental income (including maintenance and repair expenses) are ₩1,283 million (2020: ₩1,149 million). Operating expenses incurred for investment properties that do not generate rental income (including maintenance and repair expenses) are ₩12 million (2020: ₩12 million).

Operating lease

Investment properties are leased to tenants under operating leases with monthly rent payments. Where considered necessary to reduce credit risk, the Group may obtain bank guarantees for the term of the lease.

Although the Group is exposed to changes in the residual value at the end of the current leases, the Group typically enters into new operating leases and therefore will not immediately realize any reduction in residual value at the end of these leases. Expectations about the future residual values are reflected in the fair value of investment properties.

The future minimum lease payments expected to be received in relation to the above operating lease agreement for investment properties as at December 31, 2021 and 2020, are as follows:

(in millions of Korean won)	**2021**	**2020**
Within one year	6,874	503
Within two years	6,016	172
Within five years	-	500
Total	12,890	1,175

37. Revenue from Contracts with Customers

(a) On February 11, 2021, the U.S. International Trade Commission (ITC) issued its final determination that SK Innovation had infringed the Group's trade secrets. On May 15, 2021, the Group and SK Innovation entered into an agreement to settle all legal disputes relating to the trade secret infringement. As a consideration for the settlement, SK Innovation agreed to pay the Group lump-sum payments of KRW 1 trillion and running royalties of KRW 1 trillion based on certain percentage of annual revenues of SK Innovation for certain periods.

(b) In accordance with the agreement, the Group and SK Innovation agreed to grant permanent licenses, withdraw all pending domestic and international legal disputes and also not to sue for the next 10 years. The Group determined that all payments to be received from SK Innovation are consideration in exchange for the licenses granted.

(c) Licensing is a major operating activity of the Group and the nature of the license provided by the Group to SK Innovation is a right to use and there is no performance obligation to be provided additionally after the settlement.

(d) As such, the Group recognized operating income of KRW 992,233 million for the lump-sum payments (discounted present value of the lump-sum payments of KRW 1 trillion) during the year ended December 31, 2021.

(e) In October 2021, SK on Co., Ltd. was incorporated through a split-off from SK Innovation Co., Ltd. and the agreement with the Group was transferred to SK on Co., Ltd.

38. Business Combination

On November 1, 2021 the Parent Company and its subsidiary, LG Chem Poland Sp. z o.o., acquired CEM(Chemical Electronics Material) business from LG Electronics Inc. for ₩ 524,700 million to drive competitive separator business. The Parent Company acquired the domestic CEM business for ₩ 389,973 million and the 70% shares of LG Chem Hangzhou Advanced Materials Co., Ltd.(formerly, LG Electronics(Hangzhou) Co., Ltd) for ₩ 67,027 million. LG Chem Poland Sp. z o.o., a subsidiary, acquired CEM business in Poland for ₩ 67,700 million.

The goodwill of ₩ 202,568 million arising from the business combination is attributable to sales increase from combining the operations of the Group and CEM business.

Details of consideration transferred, assets and liabilities recognized as a result of the business combination, are as follows:

(in millions of Korean won)	**LG Chem Ltd.**	**LG Chem Poland Sp. Z.o.o**
Consideration transferred		
Cash and cash equivalents	457,000	67,700
Total consideration	457,000	67,700
Identifiable assets acquired and liabilities assumed		
Cash and cash equivalents	4,376	-
Trade and other receivables[1]	190,386	26,228
Inventories	43,084	36,627
Property, plant and equipment	211,373	38,755
Intangible assets	48,841	447
Other assets	4,204	-
Trade and other payables	(213,669)	(24,602)
Provisions	(1,809)	(597)
Net defined benefit liabilities	(9,622)	-
Other liabilities	(5,930)	(522)
Deferred tax liabilities	(3,851)	-
Fair value of net identifiable assets acquired	267,383	76,336
Less: non-controlling interest	(12,951)	-
Acquired amount attributable to the Parent Company	254,432	76,336
Goodwill	202,568	-
Gain from a bargain purchase	-	(8,636)
	457,000	67,700

[1] The fair value of trade receivables and other receivables as of the acquisition date and the total contractual amount are ₩ 217,624 million, of which the amount that is not expected to be recovered is ₩ 1,010 million.

The revenue and net loss in 2021 contributed by CEM business since the acquisition were ₩ 47,860 million and ₩ 3,585 million, respectively.

Revenue and profit or loss of the Group for the year ended December 31, 2021 would have been ₩ 42,779,261 million and ₩ 3,996,273 million, respectively as though the acquisition of CEM business had occurred as of the beginning of the year ended December 31, 2021.

39. Events after the Reporting Period

(a) In January 2022, the Group disposed of 8,500,000 shares of LG Energy Solution, Ltd. (4.25% of ownership), which was classified as assets held for sale in accordance with the approval of the Board of Directors in December 2021. The percentage of ownership held by the Company over LG Energy Solution, Ltd. has been decreased from 100% to 81.8% after this transaction.

(b) In January 2022, the Group approved the investment of the 3rd facility in Ultium Cells LLC, a joint venture with GM in the U.S., to cope with growing demand for electric vehicle batteries in North American market.

(c) LG Energy Solution, Ltd. has listed its shares on the Korea Exchange on January 27, 2022, to expand domestic and overseas investments.

(d) In February 2022, the Group acquired 100% shares of NEC Energy Solution, which is Energy Saving System (ESS) integrated (SI) company, from its parent company, Japan NEC Corporation.

40. Approval of Issuance of the Financial Statements

The consolidated financial statements 2021 were approved for issue by the Board of Directors on February 22, 2022 and are subject to change with approval of shareholders at their Annual General Meeting.

Independent Auditor's Report

(English Translation of a Report Originally Issued in Korean)

To the Board of Directors and Shareholders of
LG Chem, Ltd.

Opinion

We have audited the accompanying consolidated financial statements of LG Chem, Ltd. and its subsidiaries (collectively referred to as the "Group"), which comprise the consolidated statements of financial position as at December 31, 2020 and 2019, and consolidated statements of profit or loss, consolidated statements of comprehensive income, consolidated statements of changes in equity and consolidated statements of cash flows for the years then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as at December 31, 2020 and 2019, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (Korean IFRS).

Basis for Opinion

We conducted our audits in accordance with Korean Standards on Auditing. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Consolidated Financial Statements* section of our report. We are independent of the Group in accordance with the ethical requirements of the Republic of Korea that are relevant to our audit of the consolidated financial statements and we have fulfilled our other ethical responsibilities in accordance with the ethical requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Emphasis of Matter

Without modifying our opinion, we draw attention to Note 4 to the consolidated financial statements. Note 4 to the consolidated financial statements describes management's plans and action taken to resolve uncertainty relating to the impact of Coronavirus disease 2019 (COVID-19) on the Group's productivity and ability to satisfy customer's orders, and to solve these events or circumstances.

Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

(1) Goodwill impairment assessment for Life Sciences Cash Generating Unit

Why this matter was determined to be a key audit matter

We focused on goodwill impairment assessment due to the significance of size of goodwill balance (₩887,037 million as at December 31, 2020) and because the measurement of the recoverable amount of the Group's Cash Generating Units (CGUs) involves management's judgements about the future results of the business, discount rate and adjustments arising from the perspective of market participants. Details are described in Note 12.

In particular, we focused our audit effort on the goodwill recognized in relation to the Life Sciences CGU (₩686,229 million as at December 31, 2020) which is the most significant unit among all relevant CGUs with goodwill. The Life Sciences business was acquired by the Group in 2017 and has not recognized impairment on goodwill since then. We focused on this area due to the significance of size of goodwill balance.

How this matter was addressed in our audit

Audit procedures we performed to address this key audit matter include:

- Understanding, evaluation and testing of the design and operating effectiveness of relevant internal controls in place in connection with impairment assessment of goodwill including review and approval by management of future cash flow forecasts and assumptions applied in the assessment.
- Evaluation of valuation model used by management to estimate value-in-use.
- Comparison of future cash flow forecasts used to estimate value-in-use with the budgets approved by the management except for the cash flows relating to specific fixed assets adjusted from the perspective of market participants.
- Comparison of the current year actual results with the prior year forecasts to assess whether management's forecasts included optimistic assumptions.
- Evaluation of management's assumptions used to estimate value-in-use.
  - Comparison of estimated revenue growth rate, operating margin rate and capital expenditures applied to estimate value-in-use with historical performances of the CGU and the current market condition to evaluate whether applied assumptions are consistent.
  - Evaluation of long-term growth rate by considering economic and industry forecasts
  - Comparison of the discount rate used by the management with the discount rate independently calculated by us using observable information in the market.
- Evaluation of CGUs identification and testing of book values allocated to CGUs
- Evaluation of sensitivity analysis performed by management on the discount rate and terminal growth rate.

Other Matter

Auditing standards and their application in practice vary among countries. The procedures and practices used in the Republic of Korea to audit such financial statements may differ from those generally accepted and applied in other countries

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with Korean IFRS, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group or to cease operations.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Korean Standards on Auditing will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with Korean Standards on Auditing, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we

conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the Group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The engagement partner on the audit resulting in this independent auditor's report is Kibok Lee, Certified Public Accountant.

/s/ Samil PricewaterhouseCoopers

Seoul, Korea

March 11, 2021

This report is effective as of March 11, 2021, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statements and notes thereto. Accordingly, the readers of the audit report should understand that there is a possibility that the above audit report may have to be revised to reflect the impact of such subsequent events or circumstances, if any.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Financial Position
December 31, 2020 and 2019

(in millions of Korean won)	Notes	2020	2019
Assets			
Current assets			
Cash and cash equivalents	3, 5, 6	3,274,250	1,888,631
Trade receivables	3, 5, 7, 31	5,298,365	3,738,224
Other receivables	3, 5, 7, 31	924,303	266,551
Other current financial assets	3, 5, 8	23,821	10,879
Prepaid income taxes		17,049	118,349
Other current assets	13	643,152	793,796
Inventories	9	5,349,688	5,033,721
Assets held for sale	34	789,072	19,573
Total current assets		16,319,700	11,869,724
Non-current assets			
Trade receivables	3, 5, 7	29,376	-
Other receivables	3, 5, 7	255,030	172,933
Other non-current financial assets	3, 5, 8	81,532	159,955
Investments in associates and joint ventures	1, 10, 33	309,329	307,577
Deferred tax assets	28	1,409,757	516,606
Property, plant and equipment	11	20,567,475	18,593,642
Intangible assets	12	2,279,917	2,206,229
Investment properties	36	49,433	53,328
Other non-current assets	13	87,345	144,432
Total non-current assets		25,069,194	22,154,702
Total assets		41,388,894	34,024,426
Liabilities			
Current liabilities			
Trade payables	3, 5, 31	3,458,526	2,379,711
Other payables	3, 5, 31	5,266,974	4,142,953
Borrowings	3, 5, 14	1,548,815	1,356,097
Other current fiancial liabilities	3, 5, 8	16,797	-
Provisions	15	1,041,451	472,129
Income tax payables	28	373,244	84,713
Other current liabilities	17	788,029	505,926
Liabilities held for sale	34	130,383	-
Total current liabilities		12,624,219	8,941,529
Non-current liabilities			
Other payables	3, 5	11,927	10,951
Borrowings	3, 5, 14	8,637,302	7,058,171
Other non-current financial liabilities	3, 5, 8	41,768	930
Provisions	15	328,556	264,599
Net defined benefit liabilities	16	117,959	179,160
Deferred tax liabilities	28	689,817	51,812
Other non-current liabilities	17	146,906	133,485
Total non-current liabilities		9,974,235	7,699,108
Total liabilities		22,598,454	16,640,637

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Financial Position
December 31, 2020 and 2019

(in millions of Korean won)	Notes	2020	2019
Equity			
Share capital	1, 19	391,406	391,406
Capital surplus		2,692,485	2,274,620
Other components of equity	21	(54,998)	(374,243)
Accumulated other comprehensive loss		(165,076)	(85,496)
Retained earnings	20	15,175,304	14,798,690
Equity attributable to owners of the Parent Company		18,039,121	17,004,977
Non-controlling interests		751,319	378,812
Total equity		18,790,440	17,383,789
Total liabilities and equity		41,388,894	34,024,426

The above consolidated statements of financial position should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Profit or Loss
Years Ended December 31, 2020 and 2019

(in millions of Korean won, except per share amounts)	Notes	2020	2019
Revenue	31, 33	30,076,510	27,353,078
Cost of sales	23, 31	(23,764,286)	(22,667,434)
Gross profit		6,312,224	4,685,644
Selling and administrative expenses	22, 23, 31	(4,514,065)	(3,860,229)
Operating profit	33	1,798,159	825,415
Finance income	5, 25	417,468	286,178
Finance costs	5, 25	(1,109,585)	(421,274)
Share of net profit of associates and joint ventures accounted for using the equity method	10	9,343	22,211
Other non-operating income	5, 26	1,155,244	519,121
Other non-operating expenses	5, 27	(1,326,937)	(657,208)
Profit before income tax	32	943,692	574,443
Income tax expense	28	(367,839)	(169,181)
Profit from continuing operations		575,853	405,262
Profit (loss) from discontinued operations	34	106,555	(29,158)
Profit for the year		682,408	376,104
Profit is attributable to:			
Owners of the Parent Company			
Profit from continuing operations		406,079	342,523
Profit (loss) from discontinued operations		106,555	(29,158)
		512,634	313,365
Non-controlling interests			
Profit from continuing operations		169,774	62,739
		169,774	62,739
Earnings per share for profit attributable to the equity holders of the Parent Company *(in won)*	29		
Basic earnings per ordinary share		6,666	4,085
Basic earnings per preferred share		6,716	4,135
Diluted earnings per ordinary share		6,666	3,875
Diluted earnings per preferred share		6,716	3,925
Earnings per share for profit from continuing operations attributable to the equity holders of the Parent Company *(in won)*	29		
Basic earnings per ordinary share		5,279	4,466
Basic earnings per preferred share		5,329	4,516
Diluted earnings per ordinary share		5,279	4,249
Diluted earnings per preferred share		5,329	4,299

The above consolidated statements of profit or loss should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Comprehensive Income
Years Ended December 31, 2020 and 2019

(in millions of Korean won)	Notes	2020	2019
Profit for the year		682,408	376,104
Other comprehensive income			
Items that will not be reclassified to profit or loss			
Remeasurements of net defined benefit liability	16	25,345	(65,806)
Gain on valuation of financial assets at fair value through other comprehensive income		2,364	35,331
Shares of remeasurements of net defined benefit liabilities of associates		365	(132)
Income tax relating to these items		(7,580)	8,544
Items that may be subsequently reclassified to profit or loss			
Exchange differences on translation of foreign operations		(115,678)	67,216
Cash flow hedge		2,451	39,848
Shares of other comprehensive income (loss) of accociates and joint ventures		29,554	(2,075)
Income tax relating to these items		(7,071)	(10,510)
Other comprehensive income (loss) for the year, net of tax		(70,250)	72,416
Total comprehensive income for the year		612,158	448,520
Total comprehensive income for the year is attributable to:			
Owners of the Parent Company		451,834	383,185
Non-controlling interest		160,324	65,335

The above consolidated statements of comprehensive income should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Changes in Equity
Years Ended December 31, 2020 and 2019

(in millions of Korean won)		Attributable to owners of the Parent Company							
	Notes	Share capital	Capital surplus	Other components of equity	Accumulated other comprehensive income(loss)	Retained earnings	Total	Non-controlling interests	Total equity
Balance at January 1, 2019		391,406	2,274,623	(374,243)	(202,994)	14,994,252	17,083,044	239,084	17,322,128
Comprehensive income									
Profit for the year		-	-	-	-	313,365	313,365	62,739	376,104
Remeasurements of net defined benefit liability	16	-	-	-	-	(47,546)	(47,546)	-	(47,546)
Exchange differences on translation of foreign operations		-	-	-	65,068	-	65,068	2,596	67,664
Gain on valuation of financial assets at fair value through other comprehensive income		-	-	-	25,615	-	25,615	-	25,615
Cash flow hedge		-	-	-	28,890	-	28,890	-	28,890
Others		-	-	-	(2,075)	(132)	(2,207)	-	(2,207)
Total comprehensive income for the year		-	-	-	117,498	265,687	383,185	65,335	448,520
Transactions with owners:									
Dividends	30	-	-	-	-	(460,058)	(460,058)	(23,852)	(483,910)
Increase in paid-in capital of a subsidiary		-	-	-	-	-	-	98,642	98,642
Others		-	(3)	-	-	(1,191)	(1,194)	(397)	(1,591)
Total transactions with owners		-	(3)	-	-	(461,249)	(461,252)	74,393	(386,859)
Balance at December 31, 2019		391,406	2,274,620	(374,243)	(85,496)	14,798,690	17,004,977	378,812	17,383,789
Balance at January 1, 2020		391,406	2,274,620	(374,243)	(85,496)	14,798,690	17,004,977	378,812	17,383,789
Comprehensive income									
Profit for the year		-	-	-	-	512,634	512,634	169,774	682,408
Remeasurements of net defined benefit liability	16	-	-	-	-	18,415	18,415	-	18,415
Exchange differences on translation of foreign operations		-	-	-	(112,625)	-	(112,625)	(9,450)	(122,075)
Gain on valuation of financial assets at fair value through other comprehensive income		-	-	-	1,714	-	1,714	-	1,714
Cash flow hedge		-	-	-	1,777	-	1,777	-	1,777
Others		-	-	-	29,554	365	29,919	-	29,919
Total comprehensive income for the year		-	-	-	(79,580)	531,414	451,834	160,324	612,158
Transactions with owners:									
Disposal of treasury shares		-	417,865	319,245	-	-	737,110	-	737,110
Dividends	30	-	-	-	-	(153,608)	(153,608)	(24,040)	(177,648)
Increase in paid-in capital of subsidiaries		-	-	-	-	-	-	236,620	236,620
Others		-	-	-	-	(1,192)	(1,192)	(397)	(1,589)
Total transactions with owners		-	417,865	319,245	-	(154,800)	582,310	212,183	794,493
Balance at December 31, 2020		391,406	2,692,485	(54,998)	(165,076)	15,175,304	18,039,121	751,319	18,790,440

The above consolidated statements of changes in equity should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Statements of Cash Flows
Years Ended December 31, 2020 and 2019

(in millions of Korean won)	Notes	2020	2019
Cash flows from operating activities			
Cash generated from operations	32	6,526,644	3,836,461
Interest received		28,918	58,479
Interest paid		(215,865)	(209,256)
Dividends received		14,263	12,130
Income taxes paid		(513,128)	(576,713)
Net cash inflow from operating activities		5,840,832	3,121,101
Cash flows from investing activities			
Decrease in other receivables		79,603	207,398
Decrease in other non-current receivables		75,745	53,405
Proceeds from disposal of investments in associates		382,941	16,149
Proceeds from disposal of financial instruments		91,263	3,014
Proceeds from disposal of property, plant and equipment		37,482	79,602
Proceeds from disposal of intangible assets		17,182	20,074
Government grants received		273,577	348,053
Proceeds from disposal of assets held for sale		93,165	-
Proceeds from transfer of business		354,466	6,861
Increase in other receivables		(658,735)	(169,916)
Increase in other non-current receivables		(136,854)	(114,705)
Acquisition of investments in associates		(44,006)	(47,170)
Acquisition of financial assets		(18,519)	(23,186)
Acquisition of property, plant and equipment		(5,535,791)	(6,238,203)
Acquisition of intangible assets		(123,592)	(252,288)
Cash outflows from transfer of business		(184,302)	(529)
Net cash outflow from investing activities		(5,296,375)	(6,111,441)
Cash flows from financing activities			
Proceeds from borrowings		4,073,803	3,987,118
Capital contribution from non-controlling interests		236,621	98,642
Repayments of borrowings and others		(3,194,707)	(1,301,205)
Dividends paid		(177,648)	(483,910)
Net cash inflow from financing activities		938,069	2,300,645
Net increase (decrease) in cash and cash equivalents		1,482,526	(689,695)
Cash and cash equivalents at the beginning of the year		1,888,631	2,513,702
Effects of exchange rate changes on cash and cash equivalents		(84,407)	64,624
Cash and cash equivalents included in disposal groups classified as held for sale		(12,500)	-
Cash and cash equivalents at the end of the year in the consolidated statement of financial position		3,274,250	1,888,631

The above consolidated statements of cash flows should be read in conjunction with the accompanying notes.

1. General Information

General information about LG Chem, Ltd. (the Parent Company) and its 48 subsidiaries (collectively referred to as "the Group") is as follows:

1.1 The Parent Company

The Parent Company was spun off on April 1, 2001, from LG Chem Investment Ltd. (now LG Corp., formerly LG Chemical Ltd.).

As at December 31, 2020, the Group has its manufacturing facilities in Yeosu, Daesan, Ochang, Cheongju, Ulsan, Naju, Iksan, Paju, Osong, Onsan, Gimcheon and overseas sites.

The Parent Company is authorized to issue 292 million shares of ordinary shares with par value of ₩5,000 per share. As at December 31, 2020, the Parent Company has issued and outstanding 70,592,343 ordinary shares (₩352,962 million) and 7,688,800 preferred shares (₩38,444 million). The largest shareholder of the Parent Company is LG Corp., which owns 33.34% of the Parent Company's ordinary shares. Preferred shareholders have no voting rights but are entitled to receive dividends at a rate 1% more than those paid to ordinary shareholders.

1.2 Business Overview

The Group is engaged in Petrochemicals, Energy solutions, and Advanced materials business, and also engaged in Life Sciences business acquired through a merger with LG Life Sciences, Ltd. in January 2017. In addition, the Parent Company acquired 100% shares of FarmHannong Co., Ltd., in April 2016, which is engaged to manufacture crop protection products, seeds, fertilizers and others.

The Petrochemical business includes production of olefin petrochemicals, such as ethylene, propylene, butadiene from Naphtha, and aromatic petrochemicals such as benzene. It also includes production of synthetic resin and synthetic components from olefin, and aromatic petrochemicals. This business bears characteristics of a large-volume process industry. The Group's major products are PE, PP, BPA, ABS, EP, PVC, plasticizers, acrylic, SAP, synthetic rubber, a special resin, and others.

LG Energy Solution Co., Ltd. which was established through the split-off of Energy solution business from the Parent Company on December 1, 2020, and its subsidiaries mainly manufacture and supply batteries ranging from IT & New application batteries for mobile phones and laptop computers, to automotive batteries for electric vehicles and ESS (Energy Storage System) batteries. Demand of small-sized batteries for new applications such as electric tools and electric driving devices as well as traditional IT devices is increasing recently and the automotive battery business is also expected to expand rapidly due to an increasing demand of the batteries in associated with enhanced environment regulation in developed countries. Demand for ESS is expanding with an increasing importance of efficient usage of electricity and generation of renewable energy.

The Advanced material business manufactures and supplies various kinds of IT materials such as polarizer, automotive material, OLED film, semiconductor materials,OLED materials, battery materials and others and RO membranes, which will be the next growth engine for future.

The Life Sciences business manufactures and supplies pharmaceutical products, such as human growth hormone 'Eutropin', diabetes drug 'Zemiglo', bovine somatotropin 'Boostin', hyaluronic acid filler 'YVOIRE' and others, as well as fine chemical products, such as herbicide 'PYANCHOR' for rice farming and others.

FarmHannong Co., Ltd. and its subsidiaries which were acquired by the Group in 2016 manufacture and sell crop protection products, seeds, fertilizers and others. The crop protection business provides high value products such as environmentally-friendly pesticide. The fertilizer business leads developing a next generation fertilizers such as eco-friendly organic and functional fertilizers, and potting soil. The seed business puts priority on retaining various genetic resources and developing rare breeds with high profit in order to remain competitive in a future food industry.

1.3 Consolidated Subsidiaries, Associates and Joint Ventures

	December 31, 2020			
	Percentage of ownership (%)	Business location	Closing month	Business activities
Consolidated subsidiaries				
LG Energy Solution Co., Ltd.[1]	100	Korea	December	Battery manufacturing and sales
Ningbo LG Yongxing Chemical Co., Ltd.[2]	75	China	December	ABS/SBL manufacturing and sales
Ningbo Zhenhai LG Yongxing Trade Co., Ltd.[2]	75	China	December	ABS sales
LG Chem America, Inc[3]	100	USA	December	Sales and trading
LG Chemical India Pvt. Ltd.[4]	100	India	December	Synthetic resin manufacturing and sales
LG Polymers India Pvt. Ltd.[4]	100	India	December	PS manufacturing and sales
LG Chemical (Guangzhou) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem (Nanjing) Information & Electronics Materials Co., Ltd.[1]	100	China	December	Battery/ Polarizer manufacturing and sales
LG Chem (Taiwan), Ltd.	100	Taiwan	December	Polarizer manufacturing and sales
LG Chem Display Materials (Beijing) Co., Ltd.	100	China	December	Polarizer manufacturing and sales
Tianjin LG Bohai Chemical Co., Ltd.	75	China	December	PVC, VCM, EDC manufacturing and sales
Tianjin LG BOTIAN Chemical Co., Ltd.	58	China	December	SBS manufacturing and sales
LG Chem (China) Investment Co., Ltd.	100	China	December	China holding company
LG Chem (Tianjin) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem Europe GmbH	100	Germany	December	Sales and trading
LG Chem Poland Sp. z o.o.	100	Poland	December	EP manufacturing and sales
LG Energy Solution Michigan Inc[1,5]	100	USA	December	Automotive battery research and manufacturing
LGC Petrochemical India Private Ltd.	100	India	December	Synthetic resin manufacturing and sales
HAENGBOKNURI CO., LTD.	100	Korea	December	Facility management and general cleaning
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	100	Turkey	December	Sales and trading
LG Chem Japan Co., Ltd.	100	Japan	December	Sales and trading
LG NanoH2O, LLC[3]	100	USA	December	Water processing membrane sales
Nanjing LG Chem New Energy Battery Co., Ltd.[1]	50	China	December	Automotive battery manufacturing and sales
LG Chem (Chongqing) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem Wroclaw Energy sp. z o.o.[1,6]	100	Poland	December	Automotive battery manufacturing and sales
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	70	China	December	ABS manufacturing and sales
FarmHannong Co., Ltd.[7]	100	Korea	December	Agricultural pesticide manufacturing and sales
LG Chem Life Sciences India Pvt. Ltd.	100	India	December	Pharmaceutical products sales
LG Chem Life Sciences (Beijing) Co., Ltd.	100	China	December	Pharmaceutical products sales
LG Chem Life Sciences (Thailand) Ltd.	100	Thailand	December	Pharmaceutical products sales
Farmhannong America, Inc.[7]	100	USA	December	Agricultural pesticide sales
LG Chem Hai Phong Vietnam Co., Ltd.	100	Vietnam	December	Polarizer manufacturing and sales
LG Energy Solution Australia Pty Ltd[1]	100	Australia	December	ESS sales

LG Chem Mexico S.A. de C.V.	100	Mexico	December	Sales and trading
FarmHannong(Thailand) Ltd.[7]	100	Thailand	December	Research and development on seeds
LG Chem Hai Phong engineering Plastics LLC.	100	Vietnam	December	EP manufacturing and sales
LG Chem (Guangzhou) Information & Electronics Materials Co., Ltd.	100	China	December	Polarizer manufacturing and sales
LEYOU NEW ENERGY MATERIALS(WUXI) Co., LTD[8]	51	China	December	Battery materials manufacturing and sales
LG Chem Fund I LLC[9]	100	USA	December	Investments in venture companies
Ugimag Korea Co., Ltd[10]	100	Korea	December	Electronic parts manufacturing and sales
Uniseal,Inc.[3,11]	100	USA	December	Adhesive manufacturing and sales
Uniseal Europe Ltd.[11]	100	England	December	Adhesive manufacturing and sales
LG Chem Nanjing Energy Solution Co., Ltd.[1,12]	100	China	December	Battery manufacturing and sales
LG Chem Life Science Innovation Center, Inc.[3]	100	USA	December	Pharmaceutical products research
FARMHANNONG(MALAYSIA) SDN. BHD.[7]	100	Malaysia	December	Agricultural pesticide licensing
PT FARM HANNONG INDONESIA[7,13]	100	Indonesia	December	Agricultural pesticide licensing
Ultium Cells LLC[1,14]	50	USA	December	Automotive battery manufacturing and sales
LG Energy Solution Europe GmbH[1]	100	Germany	December	Sales and trading
Associates				
TECHWIN Co., Ltd.	20	Korea	December	Environment solution and construction of chemical plant
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.[15]	100	Brazil	December	Sales and trading
LG Chem Malaysia SDN.BHD.[15]	100	Malaysia	December	Sales and trading
FJ Composite Material Co., Ltd.	30	Japan	May	Heat diffuser research and manufacturing
WUXI CL New Energy Technology Ltd. [1]	30	China	December	ESS manufacturing and sales
LG Chem Life Sciences Poland Ltd.[15]	100	Poland	December	Pharmaceutical products sales
Combustion Synthesis Co., Ltd.	36	Japan	December	Nitride-based ceramic powder production
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.[16]	49	China	December	Battery materials manufacturing and sales
VINFAST LITHIUM BATTERY PACK LLC. [1]	35	Vietnam	December	Battery manufacturing and sales
Jiangxi VL Battery., Ltd. [1,17]	34	China	December	Battery manufacturing and sales
Joint ventures				
LG VINA Chemical Co., Ltd.	50	Vietnam	December	DOP production and sales
HL Greenpower Co., Ltd. [1]	49	Korea	December	Automotive battery manufacturing and sales
SEETEC Co., Ltd.	50	Korea	December	Plant utility and distribution, research assistance service

[1] LG Energy Solution Co., Ltd was established through the split-off of Energy solution business from the Parent Company during the year ended December 31, 2020. LG Energy Solution owns 100% of LG Energy Solution Michigan Inc., LG Chem Wroclaw Energy sp. z o.o., LG Energy Solution Australia Pty Ltd, LG Chem Nanjing Energy Solution Co., Ltd. and LG Energy Solution Europe GmbH's shares, 80.79% of LG Chem (Nanjing) Information & Electronics Materials Co., Ltd.'s shares and 50% of Nanjing LG Chem New Energy Battery Co.,Ltd. and Ultium Cells LLC's shares. The Group owns 100% of LG Energy Solution Co., Ltd's shares.

[2] As at December 31, 2020, Ningbo LG Yongxing Chemical Co., Ltd. owns 100% of Ningbo Zhenhai LG Yongxing Trading Co., Ltd.'s shares.

[3] During the year ended December 31, 2020, the Parent Company acquired 100% of LG Chem America, Inc., LG NanoH2O, LLC, Uniseal,Inc. and LG Chem Life Science Innovation Center, Inc.'s shares formerly owned by LG Energy Solution Michigan Inc...

[4] As at December 31, 2020, LG Chemical India Pvt. Ltd. owns 100% of LG Polymers India Pvt. Ltd.'s shares.

[5] During the year ended December 31, 2020, the Parent Company acquired additional shares of LG Energy Solution Michigan Inc. for ₩206,238 million.

[6] During the year ended December 31, 2020, the Parent Company acquired additional shares of LG Chem Wroclaw Energy sp. z o.o. for ₩413,739 million.
[7] As at December 31, 2020, FarmHannong Co., Ltd. owns 100% of Farmhannong America, Inc., FarmHannong(Thailand) Ltd. and FARMHANNONG(MALAYSIA) SDN.BHD.'s shares, and 100% of PT FARM HANNONG INDONESIA's shares.
[8] During the year ended December 31, 2020, the Parent Company acquired additional shares of LEYOU NEW ENERGY MATERIALS(WUXI) Co., LTD. for ₩17,639 million.
[9] During the year ended December 31, 2020, the Parent Company acquired additional shares of LG CHEM FUND I LLC for ₩16,111 million.
[10] During the year ended December 31, 2020, the Parent Company acquired additional shares of Ugimag Korea Co., Ltd. for ₩24,500 million.
[11] Uniseal,Inc. owns 100% of Uniseal Europe Ltd's shares.
[12] During the year ended December 31, 2020, the Parent Company acquired additional shares of LG Chem Nanjing Energy Solution Co., Ltd. for ₩514,136 million.
[13] PT FARM HANNONG INDONESIA was newly established during the year ended December 31, 2020, and the Group acquired 100% shares of PT FARM HANNONG INDONESIA for ₩208 million.
[14] Ultium Cells LLC was newly established during the year ended December 31, 2020, and the Group acquired 50% shares of Ultium Cells LLC for ₩163,592 million. The Group possesses control over the investee as the Group can exercise the majority voting rights in its decision-making process and has the ability to use power to affect the variable returns of the investee through its involvement in the production and cost management and other activities in accordance with the shareholders' agreement.
[15] Classified as an investment in associate due to its small size.
[16] During the year ended December 31, 2020, the Parent Company acquired additional shares of HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD. for ₩22,191 million.
[17] During the year ended December 31, 2020, the Parent Company newly acquired 34% shares of Jiangxi VL Battery., Ltd. for ₩21,815 million.

1.4 Summarized Financial Information of Subsidiaries, Associates and Joint Ventures

Summarized financial information (before elimination of intercompany transactions and adjustments for differences in accounting policies) of subsidiaries, associates and joint ventures is as follows:

(in millions of Korean won)	December 31, 2020			2020	
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the year
Subsidiaries					
LG Energy Solution Co., Ltd.	12,342,717	5,090,619	7,252,098	632,954	(377,980)
Ningbo LG Yongxing Chemical Co.,Ltd.	1,092,905	219,173	873,732	1,718,744	363,954
Ningbo Zhenhai LG Yongxing Trade Co.,Ltd.	6,224	1,303	4,921	21,144	413
LG Chem America, Inc.	237,946	208,031	29,915	683,181	5,641
LG Chemical India Pvt. Ltd.	32,680	19	32,661	-	29
LG Polymers India Pvt. Ltd.	56,029	38,833	17,196	61,709	(62,422)
LG Chemical (Guangzhou) Engineering Plastics Co.,Ltd.	107,270	33,741	73,529	202,417	15,097
LG Chem (Nanjing) Information & Electronics Materials Co.,Ltd.[1]	3,793,936	1,536,320	2,257,616	3,187,317	351,732
LG Chem (Taiwan), Ltd.	113,717	46,372	67,345	127,861	2,693
LG Chem Display Materials (Beijing) Co.,Ltd.[1]	40,417	13,171	27,246	167	1,406
Tianjin LG Bohai Chemical Co.,Ltd.	282,683	53,113	229,570	484,912	67,720
Tianjin LG BOTIAN Chemical Co.,Ltd.	38,391	14,760	23,631	107,588	8,991
LG Chem (China) Investment Co.,Ltd.	703,145	392,501	310,644	61,415	77,465
LG Chem (Tianjin) Engineering Plastics Co.,Ltd.	52,446	10,440	42,006	60,210	3,923

LG Chem Europe GmbH	229,078	166,779	62,299	656,984	16,461
LG Chem Poland Sp. z o.o.	74,063	27,931	46,132	110,923	10,237
LG Energy Solution Michigan Inc.	915,288	607,065	308,223	727,897	(121,895)
LGC Petrochemical India Private Ltd.	3,722	590	3,132	3,721	362
HAENGBOKNURI CO., LTD.	4,869	2,453	2,416	11,562	537
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	7,033	6,154	879	44,961	55
LG Chem Japan Co.,Ltd.	5,863	852	5,011	5,730	573
LG NanoH2O, LLC[2]	33,155	11,117	22,038	40,871	5,033
Nanjing LG Chem New Energy Battery Co.,Ltd.	1,059,066	781,217	277,849	1,237,064	63,336
LG Chem (Chongqing) Engineering Plastics Co.,Ltd.	38,629	10,973	27,656	49,391	5,067
LG Chem Wroclaw Energy sp. z o.o.	6,526,231	5,350,936	1,175,295	5,119,379	(302,248)
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	392,176	199,465	192,711	700,735	118,374
FarmHannong Co., Ltd.[2,3]	1,023,232	646,884	376,348	601,679	7,940
LG Chem Life Sciences India Pvt. Ltd.	1,295	837	458	5,176	1,027
LG Chem Life Sciences (Beijing) Co.,Ltd.	2,099	716	1,383	1,856	82
LG Chem Life Sciences (Thailand) Ltd.	22,854	9,722	13,132	33,434	2,752
LG Chem Hai Phong Vietnam Company Ltd.	14,277	6,770	7,507	16,881	1,264
LG Energy Solution Austrailia Pty Ltd.	4,793	3,049	1,744	9,398	565
LG Chem Mexico S.A. de C.V.	1,081	152	929	1,362	214
LG Chem Hai Phong Engineering Plastics Ltd.	23,110	11,430	11,680	16,148	(1,395)
LG Chem (Guangzhou) Information & Electronics Materials Co.,Ltd.[1]	630,513	399,728	230,785	49,440	62,871
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD	429,359	97,122	332,237	50,174	1,874
LG Chem Fund I LLC	28,842	31	28,811	-	(4,109)
Ugimag Korea Co., Ltd.[2]	39,015	15,903	23,112	17,638	(7,905)
Uniseal,Inc.[2,3]	34,452	6,050	28,402	57,725	757
LG Chem Nanjing Energy Solution Co., Ltd.	1,767,706	964,689	803,017	837,968	42,555
LG Chem Life Science Innovation Center, Inc.	3,314	1,868	1,446	4,500	263
Ultium Cells LLC	336,851	32,309	304,542	-	11
LG Energy Solution Europe GmbH	49,626	14,814	34,812	9,855	130
Associates					
TECHWIN Co., Ltd.	134,405	38,746	95,659	112,184	11,049
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	528	80	448	1,423	252
LG Chem Malaysia SDN.BHD.	418	2	416	677	28
FJ Composite Material Co., Ltd.	11,026	4,635	6,391	1,867	302
WUXI CL New Energy Technology Ltd.	1,910	2,972	(1,062)	1,065	(34)
LG Chem Life Sciences Poland Ltd.	191	78	113	256	11
Combustion Synthesis Co., Ltd.	717	66	651	105	(488)
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	226,471	43,454	183,017	-	565
VINFAST LITHIUM BATTERY PACK LLC.	18,148	6,322	11,826	19,555	(1,342)
Jiangxi VL Battery.,Ltd	67,186	4,066	63,120	-	208
Joint ventures					
LG VINA Chemical Co., Ltd.	35,832	27,515	8,317	91,304	2,237
HL Greenpower Co., Ltd.	406,928	360,547	46,381	1,255,431	(591)
SEETEC Co., Ltd.	342,227	55,056	287,171	490,978	14,556

[1] LCD polarizer business of these entities was classified as discontinued operations and profit or loss from the business was included in profit from discontinued operations(Note 34).
[2] Fair value adjustments due to business combination recorded in the consolidated financial statements are not included in the above information.
[3] Represent financial information of intermediate parent company consolidating its subsidiaries.

(in millions of Korean won)

	December 31, 2019			2019	
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the year
Subsidiaries					
Ningbo LG Yongxing Chemical Co.,Ltd.	781,530	174,627	606,903	1,788,258	137,332
Ningbo Zhenhai LG Yongxing Trade Co.,Ltd.	5,956	1,472	4,484	19,640	462
LG Chem HK Ltd.	-	-	-	-	25
LG Chem America, Inc.	311,718	285,645	26,073	799,045	3,910
LG Chemical India Pvt. Ltd.	32,758	17	32,741	-	37
LG Polymers India Pvt. Ltd.	122,078	37,794	84,284	222,831	6,312
LG Chemical (Guangzhou) Engineering Plastics Co.,Ltd.	103,530	42,832	60,698	206,281	10,063
LG Chem (Nanjing) Information & Electronics Materials Co.,Ltd.[1]	3,685,798	1,785,288	1,900,510	2,497,968	78,425
LG Chem (Taiwan), Ltd.	101,804	34,195	67,609	137,779	3,331
LG Chem Display Materials (Beijing) Co.,Ltd.[1]	41,729	11,486	30,243	-	-
Tianjin LG Bohai Chemical Co.,Ltd.	244,047	81,853	162,194	512,294	52,738
Tianjin LG BOTIAN Chemical Co.,Ltd.	43,473	28,726	14,747	146,675	11,383
LG Chem (China) Investment Co.,Ltd.	934,186	630,040	304,146	64,873	40,099
LG Chem (Tianjin) Engineering Plastics Co.,Ltd.	45,380	7,448	37,932	65,895	(1,110)
LG Chem Europe GmbH	330,807	286,252	44,555	822,405	9,467
LG Chem Poland Sp. z o.o.	63,814	26,005	37,809	115,275	1,705
LG Energy Solution Michigan Inc.	709,715	448,675	261,040	398,498	(37,766)
LGC Petrochemical India Private Ltd.	3,762	708	3,054	4,359	540
HAENGBOKNURI CO., LTD.	3,716	1,837	1,879	10,547	325
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	9,807	8,601	1,206	38,705	326
LG Chem Japan Co.,Ltd.	5,638	1,138	4,500	6,528	574
LG NanoH2O, LLC	23,684	5,219	18,465	28,967	3,668
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd.	-	-	-	-	1,350
Nanjing LG Chem New Energy Battery Co.,Ltd.	1,002,457	845,483	156,974	1,163,760	33,573
LG Chem (Chongqing) Engineering Plastics Co.,Ltd.	33,009	10,480	22,529	35,333	(2,328)
LG Chem Wroclaw Energy sp. z o.o.	4,330,353	3,211,121	1,119,232	2,285,190	(202,085)
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	364,406	288,234	76,172	595,646	(1,481)
FarmHannong Co., Ltd.[2,3]	1,022,865	652,462	370,403	590,412	(19,510)
LG Chem Life Sciences India Pvt. Ltd.	2,774	3,322	(548)	6,940	(652)
LG Chem Life Sciences (Beijing) Co.,Ltd.	1,878	585	1,293	1,398	79
LG Chem Life Sciences (Thailand) Ltd.	26,245	15,190	11,055	40,645	4,534
LG Chem Hai Phong Vietnam Company Ltd.	17,152	10,502	6,650	36,292	1,958
LG Energy Solution Austrailia Pty Ltd.	2,595	1,471	1,124	2,884	422
LG Chem Mexico S.A. de C.V.	930	152	778	1,434	213
LG Chem Hai Phong Engineering Plastics Ltd.	22,794	9,053	13,741	3,470	(2,325)
LG Chem (Guangzhou) Information & Electronics Materials Co.,Ltd.[1]	570,429	402,793	167,636	34	(1,437)
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD	348,722	54,207	294,515	-	900
LG Chem Fund I LLC	18,317	63	18,254	-	(3,491)
Ugimag Korea Co., Ltd.[2]	39,082	32,563	6,519	21,110	(7,109)
Uniseal,Inc.[2,3]	36,013	6,218	29,795	62,650	1,862
LG Chem Nanjing Energy Solution Co., Ltd.	807,952	550,770	257,182	8,365	(13,643)
LG Chem Life Science Innovation Center, Inc.	3,558	2,281	1,277	2,467	123
Associates					
LG Holdings (HK) Ltd.	196,270	40,724	155,546	49,483	15,356
TECHWIN Co., Ltd.	173,997	81,803	92,194	284,209	35,430

LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR Q UIMICO LTDA.	410	108	302	1,730	229
LG Chem Malaysia SDN.BHD.	409	2	407	858	104
LG Fuel Cell Systems Inc.	-	-	-	265	(3,714)
FJ Composite Material Co., Ltd.	8,393	4,692	3,701	1,228	169
WUXI CL New Energy Technology Ltd.	3,701	4,617	(916)	(2,306)	(5,385)
LG Chem Life Sciences Poland Ltd.	178	87	91	261	18
Combustion Synthesis Co., Ltd.	971	79	892	58	(696)
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	203,635	66,725	136,910	-	508
VINFAST LITHIUM BATTERY PACK LLC.	28,283	14,413	13,870	5,652	(544)
Joint ventures					
LG VINA Chemical Co., Ltd.	34,259	27,559	6,700	54,935	(623)
HL Greenpower Co., Ltd.	401,313	353,936	47,377	1,086,634	5,427
SEETEC Co., Ltd..	351,935	59,732	292,203	596,824	13,959

[1] LCD polarizer business of these entities was classified as a discontinued operation and profit or loss from the business was included in profit or loss from discontinued operation(Note 34).
[2] Fair value adjustments due to business combination recorded in the consolidated financial statements are not included in the above information.
[3] Represent financial information of intermediate parent company consolidating its subsidiaries.

1.5 Changes in Scope for Consolidation

Subsidiaries newly included in the consolidation for the year ended December 31, 2020, are as follows:

Subsidiary	Reason
PT FARM HANNONG INDONESIA	Newly established
Ultium Cells LLC	Newly established
LG Energy Solution Co., Ltd.	Newly established
LG Energy Solution Europe GmbH	Newly established

Subsidiary excluded from the consolidation for the year ended December 31, 2020, is as follows:

Subsidiary	Reason
Farm Hannong (Heilongjiang) Chemical Co., Ltd.	Disposed

2. Summary of Significant Accounting Policies

The principal accounting policies applied in the preparation of these consolidated financial statements are set out below. These policies have been consistently applied to all the years presented, unless otherwise stated.

2.1 Basis of Preparation

The Group maintains its accounting records in Korean won and prepares statutory financial statements in the Korean language (Hangul) in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (Korean IFRS). The accompanying consolidated financial statements have been condensed, restructured and translated into English from the Korean language financial statements.

Certain information attached to the Korean language financial statements, but not required for a fair presentation of the Group's financial position, financial performance or cash flows, is not presented in the accompanying consolidated financial statements.

The consolidated financial statements of the Group have been prepared in accordance with Korean IFRS. These are the standards, subsequent amendments and related interpretations issued by the International Accounting Standards Board (IASB) that have been adopted by the Republic of Korea.

The financial statements have been prepared on a historical cost basis, except for the following:

- Certain financial assets and liabilities (including derivative instruments),
- Assets held for sale – measured at fair value less costs to sell, and
- Defined benefit pension plans – plan assets measured at fair value

The preparation of financial statements requires the use of critical accounting estimates. Management also needs to exercise judgement in applying the Group's accounting policies. The areas involving a higher degree of judgment or complexity, or areas where assumptions and estimates are significant to the consolidated financial statements are disclosed in Note 4.

2.2 Changes in Accounting Policies and Disclosures

(a) New and amended standard adopted by the Group

The Group has applied the following standards and amendments for the first time for their annual reporting period commencing January 1, 2020.

- *Amendments to Korean IFRS 1001 Presentation of Financial Statements and Korean IFRS 1008 Accounting policies, changes in accounting estimates and errors – Definition of Material*

The amendments clarify the definition of material. Information is material if omitting, misstating or obscuring it could reasonably be expected to influence the decisions that the primary users of general-purpose financial statements make on the basis of those financial statements. The amendments do not have a significant impact on the financial statements.

- Amendments to Korean IFRS 1103 Business Combination – Definition of a Business

The amended definition of a business requires an acquisition to include an input and a substantive process that together significantly contribute to the ability to create outputs and the definition of output excludes the returns in the form of lower costs and other economic benefits. If substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or group of similar identifiable assets, an entity may elect to apply an optional concentration test that permits a simplified assessment of whether an acquired set of activities and assets is not a business. The amendments do not have a significant impact on the financial statements.

- Amendments to Korean IFRS 1109 Financial Instruments, Korean IFRS 1039 Financial Instruments: Recognition and Measurement and Korean IFRS 1107 Financial Instruments: Disclosure – Interest Rate Benchmark Reform

The amendments allow to apply the exceptions in relation the application of hedge accounting while uncertainties arising from interest rate benchmark reform exist. The exceptions require the Group assumes that the interest rate benchmark on which the hedged items and the hedging instruments are based on is not altered as a result of interest rate benchmark reform, when determining whether the expected cash flows are highly probable, whether an economic relationship between the hedged item and the hedging instrument exists, and when assessing the hedging relationship is highly effective.

(b) New standards and interpretations not yet adopted by the Group

The following new accounting standards and interpretations have been published that are not mandatory for December 31, 2020 reporting periods and have not been early adopted by the Group.

- Amendments to Korean IFRS 1116 Lease – Practical expedient for COVID-19 - Related Rent Exemption, Concessions, Suspension

As a practical expedient, a lessee may elect not to assess whether a rent concession occurring as a direct consequence of the COVID-19 pandemic is a lease modification, and the amounts recognized in profit or loss as a result of applying this exemption should be disclosed. The amendments should be applied for annual periods beginning on or after June 1, 2020, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Amendments to Korean IFRS 1109 Financial Instruments, Korean IFRS 1039 Financial Instruments: Recognition and Measurement, Korean IFRS 1107 Financial Instruments: Disclosure, Korean IFRS 1104 Insurance Contracts and Korean IFRS 1116 Lease – Interest Rate Benchmark Reform

In relation to interest rate benchmark reform, the amendments provide exceptions including adjust effective interest rate instead of book amounts when interest rate benchmark of financial instruments at amortized costs is replaced, and apply hedge accounting without discontinuance although the interest rate benchmark is replaced in hedging relationship. The amendments should be applied for annual periods beginning on or after January 1, 2021, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Amendments to Korean IFRS 1103 Business Combination – Reference to the Conceptual Framework

The amendments update a reference of definition of assets and liabilities qualify for recognition in revised Conceptual Framework for Financial Reporting. However, the amendments add an exception for the recognition of liabilities and contingent liabilities within the scope of Korea IFRS 1037 *Provisions, Contingent Liabilities and Contingent Assets*, and Korean IFRS 2121 *Levies*. The amendments also confirm that contingent assets should not be recognized at the acquisition date. The amendments should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Amendments to Korean IFRS 1016 Property, Plant and Equipment - Proceeds before intended

use

The amendments prohibit an entity from deducting from the cost of an item of property, plant and equipment any proceeds from selling items produced while the entity is preparing the asset for its intended use. Instead, the entity will recognize the proceeds from selling such items, and the costs of producing those items, in profit or loss. The amendments should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group is in review for the impact of these amendments on the financial statements.

- Amendments to Korean IFRS 1037 Provisions, Contingent Liabilities and Contingent Assets - Onerous Contracts: Cost of Fulfilling a Contract

The amendments clarify that the direct costs of fulfilling a contract include both the incremental costs of fulfilling the contract and an allocation of other costs directly related to fulfilling contracts when assessing whether the contract is onerous. The amendments should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Annual improvements to Korean IFRS 2018-2020

Annual improvements of Korean IFRS 2018-2020 Cycle should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Korean IFRS 1101 *First time Adoption of Korean International Financial Reporting Standards* – Subsidiaries that are first-time adopters
- Korean IFRS 1109 *Financial Instruments* – Fees related to the 10% test for derecognition of financial liabilities
- Korean IFRS 1116 *Leases* – Lease incentives
- Korean IFRS 1041 *Agriculture* – Measuring fair value

- Amendments to Korean IFRS 1001 Presentation of Financial Statements - Classification of Liabilities as Current or Non-current

The amendments clarify that liabilities are classified as either current or non-current, depending on the substantive rights that exist at the end of the reporting period. Classification is unaffected by the likelihood that an entity will exercise right to defer settlement of the liability or the expectations of management. Also, the settlement of liability include the transfer of the entity's own equity instruments, however, it would be excluded if an option to settle them by the entity's own equity instruments if compound financial instruments is met the definition of equity instruments and recognized separately from the liability. The amendments should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

2.3 Consolidation

The Group has prepared the consolidated financial statements in accordance with Korean IFRS 1110 *Consolidated Financial Statements*.

(a) Subsidiaries

Subsidiaries are all entities over which the Group has control. The Group controls an entity when the Group is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power to direct the activities of the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the Group. They are deconsolidated from the date that control ceases.

The acquisition method of accounting is used to account for business combinations by the Group. The consideration transferred is measured at the fair values of the assets transferred, and identifiable assets acquired and liabilities and contingent liabilities assumed in a business combination are measured initially at their fair values at the acquisition date. The Group recognizes any non-controlling interest in the acquired entity on an acquisition-by-acquisition basis either at fair value or at the non-controlling interest's proportionate share of the acquired entity's net identifiable assets. All other non-controlling interests are measured at fair values, unless otherwise required by other standards. Acquisition-related costs are expensed as incurred.

The excess of consideration transferred, amount of any non-controlling interest in the acquired entity and acquisition-date fair value of any previous equity interest in the acquired entity over the fair value of the net identifiable assets acquired is recoded as goodwill. If those amounts are less than the fair value of the net identifiable assets of the business acquired, the difference is recognized directly in the profit or loss as a bargain purchase.

For transactions with non-controlling interests that do not result in a loss of control, any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received is recognized in equity attributable to the owners of the Parent.

When the Group loses a control in a subsidiary, any retained interest in the subsidiary is remeasured at its fair value and resulting gain or loss is recognized in profit or loss.

Intercompany transactions, balances and unrealized gains on transactions between group companies are eliminated. If a member of the Group uses accounting policies other than those adopted in the consolidated financial statements for like transactions and events in similar circumstances, appropriate adjustments are made to that group member's financial statements in preparing the consolidated financial statements to ensure conformity with the group's accounting policies.

(b) Associates

Associates are entities over which the Group has significant influence but not control or joint control. Investments in associates are accounted for using the equity method of accounting, after initially being recognized at cost. Unrealized gains on transactions between the Group and its associates are eliminated to the extent of the Group's interest in the associates. If the Group's share of losses of an associate equals or exceeds its interest in the associate (including long-term interests that, in substance, form part of the Group's net investment in the associate), the Group discontinues recognizing its share of further losses. After the Group's interest is reduced to zero, additional losses are provided for, and a liability is recognized, only to the extent that the Group

has incurred legal or constructive obligations or made payments on behalf of the associate. If there is objective evidence of impairment for the investment in the associate, the Group recognizes the difference between the recoverable amount of the associate and its book amount as impairment loss.

(c) Joint Arrangements

A joint arrangement, wherein two or more parties have joint control, is classified as either a joint operation or a joint venture. A joint operator recognizes its direct right to the assets, liabilities, revenues and expenses of joint operations and its share of any jointly held or incurred assets, liabilities, revenues and expenses. Interests in joint ventures are accounted for using the equity method, after initially being recognized at cost in the consolidated statement of financial position.

2.4 Segment Reporting

Information of each operating segment is reported in a manner consistent with the business segment reporting provided to the chief operating decision-maker (Note 33). The chief operating decision-maker is responsible for allocating resources and assessing performance of the operating segments and the Group has identified the Board of Directors as the chief operating decision-maker.

2.5 Foreign Currency Translation

(a) Functional and presentation currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which each entity operates (the "functional currency"). The consolidated financial statements are presented in Korean won, which is the Parent Company's functional and presentation currency.

(b) Transactions and balances

Foreign currency transactions are translated into the functional currency using the exchange rates at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation of monetary assets and liabilities denominated in foreign currencies at year end exchange rates are generally recognized in profit or loss. They are recognized in other comprehensive income if they relate to qualifying cash flow hedges, qualifying effective portion of net investment hedges, or are attributable to monetary part of the net investment in a foreign operation.

Foreign exchange gains and losses that relate to borrowings are presented in the statement of profit or loss, within finance costs. All other foreign exchange gains and losses are presented in the statement of profit or loss within 'other income or other expenses'.

When a gain or loss on a non-monetary item is recognized in other comprehensive income, any exchange component of that gain or loss shall be recognized in other comprehensive income. As such, translation differences on equities held at fair value through other comprehensive income are recognized in other comprehensive income.

(c) Translation into the presentation currency

The results and financial position of foreign operations that have a functional currency different from the presentation currency are translated into the presentation currency as follows:

i) assets and liabilities for each statement of financial position presented are translated at the closing rate at the end of the reporting period;
ii) income and expenses for each statement of income are translated at monthly average exchange rates; and
iii) equity is translated at the historical exchange rate; and
iv) all resulting exchange differences are recognized in other comprehensive income.

2.6 Cash and Cash Equivalents

Cash and cash equivalents include cash in hand, deposits held at call with banks, other short-term highly liquid investments with original maturities of three months or less.

2.7 Financial Assets

(a) Classification

The Group classifies its financial assets in the following measurement categories:

- those to be measured at fair value through profit or loss
- those to be measured at fair value through other comprehensive income, and
- those to be measured at amortized cost

Financial assets are classified on the basis of the Group's business model for managing the financial assets and the contractual cash flow characteristics of the financial assets.

Gains and losses on financial assets measured at fair value are recognized either in profit or loss or other comprehensive income. For investments in debt instruments, this will depend on the business model in which the investment is held. The Group reclassifies debt investments when, and only when its business model for managing those assets changes.

Subsequent changes in the fair value of investments in equity instruments that are not held for trading are recognized in other comprehensive income.

(b) Measurement

At initial recognition, the Group measures a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition of the financial asset. Transaction costs of financial assets carried at fair value through profit or loss are expensed in profit or loss. Financial assets with embedded derivatives are considered in their entirety when determining whether their cash flows are solely payment of principal and interest.

A. Debt instruments

Subsequent measurement of debt instruments depends on the Group's business model for managing the asset and the cash flow characteristics of the asset. The Group classifies its debt instruments into one of the following three measurement categories:

- Amortized cost:
  Assets that are held for collection of contractual cash flows where those cash flows represent solely payments of principal and interest are measured at amortized cost. A gain or loss on a debt investment that is subsequently measured at amortized cost and is not part of a hedging relationship is recognized in profit or loss when the asset is derecognized or impaired. Interest income from these financial assets is included in 'finance income' using the effective interest rate method.

- Fair value through other comprehensive income:
  Assets that are held for collection of contractual cash flows and for selling the financial assets, where the assets' cash flows represent solely payments of principal and interest, are measured at fair value through other comprehensive income. Movements in the carrying amount are taken through other comprehensive income, except for the recognition of impairment loss (reversal of impairment loss), interest income and foreign exchange gains and losses which are recognized in profit or loss. When the financial asset is derecognized, the cumulative gain or loss previously recognized in other comprehensive income is reclassified from equity to profit or loss. Interest income from these financial assets is included in 'finance income' using the effective interest rate method. Foreign exchange gains and losses are presented in 'finance income / costs or other non-operating income / expenses' and impairment losses are presented in 'other non-operating expenses'.

- Fair value through profit or loss:
  Assets that do not meet the criteria for amortized cost or fair value through other comprehensive income are measured at fair value through profit or loss. A gain or loss on a debt investment that is subsequently measured at fair value through profit or loss and is not part of a hedging relationship is recognized in profit or loss and presented net in the statement of profit or loss within 'finance income / costs or other non-operating income / expenses' in the year in which it arises.

B. Equity instruments

The Group subsequently measures all equity investments at fair value. Where the Group's management has elected to present fair value gains and losses on equity investments in other comprehensive income, there is no subsequent reclassification of fair value gains and losses to profit or loss following the derecognition of the investment. Dividend income from such investments continue to be recognized in profit or loss as 'finance income' when the right to receive payments is established. Changes in the fair value of financial assets at fair value through profit or loss are recognized in 'finance income or finance costs' in the statement of profit or loss as applicable. Impairment loss (reversal of impairment loss) on equity investments measured at fair value through other comprehensive income are not reported separately from other changes in fair value.

(c) Impairment

The Group assesses on a forward looking basis the expected credit losses associated with its debt instruments carried at amortized cost and fair value through other comprehensive income. The impairment methodology applied depends on whether there has been a significant increase in credit risk. For trade receivables, the Group applies the simplified approach, which requires expected lifetime credit losses to be recognized from initial recognition of the receivables.

(d) Recognition and Derecognition

Regular way purchases and sales of financial assets are recognized or derecognized on trade-date, the date on which the Group commits to purchase or sell the asset. Financial assets are derecognized when the rights to receive cash flows from the financial assets have expired or have been transferred and the Group has transferred substantially all the risks and rewards of ownership.

If a transfer does not result in derecognition because the Group has retained substantially all the risks and rewards of ownership of the transferred asset, the Group continues to recognize the transferred asset in its entirety and recognizes a financial liability for the consideration received. The Group classified the financial liability as 'borrowings' in the statement of financial position.

2.8 Derivative Financial Instruments

Derivatives are initially recognized at fair value on the date a derivative contract is entered into and are subsequently remeasured to their fair value at the end of each reporting period. The accounting for subsequent changes in fair value depends on whether the derivative is designated as a hedging instrument, and if so, the nature of the item being hedged. The Group has hedge relationships and designates certain derivatives as either:

- hedges of the fair value of recognized assets or liabilities or a firm commitment (fair value hedges)
- hedges of a particular risk associated with the cash flows of recognized assets and liabilities and highly probable forecast transactions (cash flow hedges), or
- hedges of a net investment in a foreign operation (net investment hedges)

At inception of the hedge relationship, the Group documents the economic relationship between hedging instruments and hedged items including whether changes in the cash flows of the hedging instruments are expected to offset changes in the cash flows of hedged items.

The full fair value of a hedging derivative is classified as a non-current asset or liability when the remaining maturity of the hedged item is more than 12 months; it is classified as a current asset or liability when the remaining maturity of the hedged item is less than 12 months. A non-derivative financial asset and a non-derivative financial liability is classified as a current or non-current based on its expected maturity and its settlement, respectively.

Cash flow hedge
The effective portion of changes in the fair value of derivatives that are designated and qualify as cash flow hedges is recognized in the cash flow hedge reserve within equity, limited to the cumulative change in fair value (present value) of the hedged item (the present value of the cumulative change in the future expected cash flows of the hedged item) from the inception of the hedge. The ineffective portion is recognized in 'other non-operating income (expenses)'.

When option contracts are used to hedge forecast transactions, the Group designates only the intrinsic value of the option contract as the hedging instrument. Gains or losses relating to the effective portion of the change in intrinsic value of the option contracts are recognized in the cash flow hedge reserve within equity. The changes in the time value of the option contracts that relate to the hedged item ('aligned time value') are recognized within the costs of hedging in other comprehensive income within equity.

When forward contracts are used to hedge forecast transactions, the Group generally designates only the change in fair value of the forward contract related to the spot element as the hedging instrument. Gains or losses relating to the effective portion of the change in the spot element of the forward contracts are recognized in the cash flow hedge reserve within equity. The change in the forward element of the contract that relates to the hedged item is recognized within other comprehensive income within equity. In some cases, the Group may designate the full change in fair value of the forward contract (including forward points) as the hedging instrument. In such cases, the gains or losses relating to the effective portion of the change in fair value of the entire forward contract are recognized in the cash flow hedge reserve within equity.

Amounts accumulated in equity are reclassified in the periods when the hedged item affects profit or loss, as follows:

- Where the hedged item subsequently results in the recognition of a non-financial asset (such as inventory), both the deferred hedging gains and losses and the deferred time value of the option contracts or deferred forward points, if any, are included within the initial cost of the asset. The deferred amounts are ultimately recognized in profit or loss as the hedged item affects profit or loss (for example through cost of sales).

- The gain or loss relating to the effective portion of the interest rate swaps hedging variable rate borrowings is recognized in profit or loss within ‘finance cost’ at the same time as the interest expense on the hedged borrowings.

When a hedging instrument expires, or is sold, terminated, exercised, or when a hedge no longer meets the criteria for hedge accounting, any accumulated cash flow hedge reserve at that time remains in equity until the forecast transaction occurs, resulting in the recognition of a non-financial asset such as inventory. When the forecast transaction is no longer expected to occur, the cash flow hedge reserve and deferred costs of hedging that were reported in equity are immediately reclassified to profit or loss.

Changes in the fair value of any derivative instrument that does not qualify for hedge accounting are recognized immediately in profit or loss within 'other non-operating income (expenses)' or 'finance income (costs)' based on the nature of transactions.

2.9 Trade Receivables

At initial recognition, trade receivables are measured at the amount of unconditional consideration, unless the trade receivables contain a significant financing component. Trade receivables are subsequently measured at amortized cost using the effective interest method, less loss allowance.

2.10 Inventories

Inventories are stated at the lower of cost and net realizable value. Cost is determined using weighted average cost method, except for goods in transit which is determined using the specific identification method.

2.11 Assets Held for sale

Assets are classified as held for sale when their carrying amount will be recovered principally through a sale transaction rather than through continuing use and a sale is considered highly probable. The assets are measured at the lower amount between their carrying amount and the fair value less costs to sell.

2.12 Property, Plant and Equipment

Property, plant and equipment are stated at historical cost less accumulated depreciation and accumulated impairment losses. Historical cost includes expenditure that is directly attributable to the acquisition of the items.

Depreciation of all property, plant and equipment, except for land, is calculated using the straight-line method to allocate their cost or revalued amounts, net of their residual values, over their estimated useful lives as follows:

	Useful lives
Buildings	25 - 50 years
Structures	15 - 50 years
Machinery	4 - 15 years
Others	1 - 15 years

The assets' depreciation method, residual values and useful lives are reviewed, and adjusted if appropriate, at the end of each reporting period.

2.13 Investment Property

Investment property is property held to earn rentals or for capital appreciation or both. An investment property is measured initially at its cost. An investment property is measured after initial measurement at depreciated cost (less any accumulated impairment losses). The Group depreciates investment properties, except for land, using the straight-line method over their useful lives of 25 ~ 50 years.

2.14 Borrowing Costs

General and specific borrowing costs that are directly attributable to the acquisition, construction or production of a qualifying asset are capitalized during the period of time that is required to complete and prepare the asset for its intended use or sale. Investment income earned on the temporary investment of specific borrowings on qualifying assets is deducted from the borrowing costs eligible for capitalization. Other borrowing costs are expensed in the period in which they are incurred.

2.15 Government Grants

Grants from the government are recognized at their fair value where there is a reasonable assurance that the grant will be received and the Group will comply with all attached conditions. Government grants related to assets are presented in the statement of financial position by deducting the grant in arriving at the carrying amount of the asset, and government grants related to income are deferred and later deducted from the related expense.

2.16 Intangible Assets

The excess of consideration transferred and amount of acquisition-date fair value of any previous equity interest in the acquired entity over the fair value of the net identifiable assets acquired is recoded as goodwill. Goodwill is carried at its cost less accumulated impairment losses. Impairment losses on goodwill are not reversed.

Intangible assets, except for goodwill, are initially recognized at its historical cost and carried at its cost less accumulated amortization and accumulated impairment losses.

Development costs that are directly attributable to internally generated by the Group are recognized when the criteria; such as, technically feasible, generate probable future economic benefits and other, are met. Membership rights that have an indefinite useful life are not subject to amortization because there is no foreseeable limit to the period over which the assets are expected to be utilized. The Group amortizes intangible assets with a limited useful life using the straight-line method over the following periods:

	Useful lives
Development costs	3 - 15 years
Industrial property rights	5 - 15 years
Others	6 - 20 years

2.17 Research and Development

Costs associated with research are recognized as an expense as incurred. Costs that are identifiable, controllable and directly attributable to development projects are recognized as intangible asset when the following criteria are met:

- It is technically feasible to complete the development project so that it will be available for use;
- Management intends to complete the development project for its own use or selling;
- There is an ability to use or sell the development project;
- It can be demonstrated how the development project will generate probable future economic benefits;
- Adequate technical, financial resources and other resources to complete the development and to use or sell the development project are available; and
- The expenditure attributable to the development project during its development can be reliably measured.

Generally, internally generated development projects have the following stages; formulation and selection of a project, verification of idea and technology, development and testing, decision of commercialization, test of final application. Expenditures can be capitalized as intangible assets only after the decision of commercialization. Expenditures incurred in other stages are recognized as expenses on the research phase.

Internally generated development projects in the Life Sciences business have the following stages; formulation of potential candidates, preclinical research, clinical researches such as phase 1, 2 and 3 trials, approval of regulatory body and new product launch. Expenditures incurred from new drug development project are recognized as expensed on the research phase. However, expenditures incurred during clinical phase 1~3 trials from development projects for generic drugs or biosimilars are recognized as intangible assets depending on the nature of the products.

Expenditures incurred from technology license agreement with the third parties are recognized as intangible assets.

Development costs previously recognized as an expense are not recognized as an asset in a subsequent period. Capitalized development costs that are recognized as intangible assets are amortized using the straight-line method over their estimated useful lives when the assets are available for use and are tested for impairment.

2.18 Impairment of Non-financial Assets

Goodwill and intangible assets with indefinite useful life are tested annually for impairment, or more frequently if events or changes in circumstances indicate that they might be impaired. Other assets that are subject to amortization are tested for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognized for the amount by which the asset’s carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset’s fair value less costs of disposal and value in use. Non-financial assets other than goodwill that suffered an impairment are reviewed for possible reversal of the impairment at the end of each reporting period.

2.19 Trade and Other Payables

These amounts represent liabilities for goods and services provided to the Group prior to the end of reporting period which are unpaid. Trade and other payables are presented as current liabilities, unless payment is not due within 12 months after the reporting period. They are recognized initially at their fair value and subsequently measured at amortized cost using the effective interest method.

2.20 Financial Liabilities

(a) Classification and measurement

The Group's financial liabilities at fair value through profit or loss are financial instruments held for trading. A financial liability is held for trading if it is incurred principally for the purpose of repurchasing in the near term. A derivative that is not a designated as hedging instruments and an embedded derivative that is separated are also classified as held for trading.

The Group classifies non-derivative financial liabilities, except for financial liabilities at fair value through profit or loss, financial guarantee contracts and financial liabilities that arise when a transfer of financial assets does not qualify for derecognition, as financial liabilities carried at amortized cost and present as 'trade payables', 'borrowings', and 'other payables' in the statement of financial position.

(b) Derecognition

Financial liabilities are removed from the statement of financial position when it is extinguished; for example, when the obligation specified in the contract is discharged or cancelled or expired or when the terms of an existing financial liability are substantially modified. The difference between the carrying amount of a financial liability extinguished or transferred to another party and the consideration paid (including any non-cash assets transferred or liabilities assumed) is recognized in profit or loss.

2.21 Financial Guarantee Contracts

Financial guarantee contract is recognized as a financial liability at the time the guarantee is issued. The liability is initially measured at fair value, subsequently at the higher of following and recognized in the statement of financial position within 'other financial liabilities'.

- the amount determined in accordance with the expected credit loss model under Korean IFRS 1109 *Financial Instruments* and

- the amount initially recognized less, where appropriate, the cumulative amount of income recognized in accordance with Korean IFRS 1115 *Revenue from Contracts with Customers*

2.22 Compound Financial Instruments

Compound financial instruments that the Group has issued are exchangeable bonds that can be exchanged into equity instruments at the option of the holder.

The liability component of this compound financial instrument is recognized initially at the fair value and subsequently recognized at amortized cost until conversion or maturity of the bonds. The equity component is remeasured at fair value until conversion or maturity of the bonds. Any directly attributable transaction costs are allocated to the liability and equity components in proportion to their initial carrying amounts.

2.23 Current and Deferred Tax

The tax expense for the period consists of current and deferred tax. Current and deferred tax is recognized in profit or loss, except to the extent that it relates to items recognized in other comprehensive income or directly in equity. In this case, the tax is also recognized in other comprehensive income or directly in equity, respectively.

The current income tax expense is measured at the amount expected to be paid to the taxation authorities, using the tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. Management periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation, and considers whether it is probable that a taxation authority will accept an uncertain tax treatment. The Group measures its tax balances either based on the most likely amount or the expected value, depending on which method provides a better prediction of the resolution of the uncertainty.

Deferred income tax is provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements. However, deferred income tax is not accounted for if it arises from initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither accounting nor taxable profit or loss.

Deferred tax assets are recognized only if it is probable that future taxable amounts will be available to utilize those temporary differences and losses.

The Group recognizes a deferred tax liability all taxable temporary differences associated with investments in subsidiaries, associates, and interests in joint arrangements, except to the extent that the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. In addition, The Group recognizes a deferred tax asset for all deductible temporary differences arising from such investments to the extent that it is probable the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized.

Deferred tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets and liabilities and when the deferred tax balances relate to the same taxation authority. Current tax assets and tax liabilities are offset when the Group has a legally enforceable right to offset and intends either to settle on a net basis, or to realize the assets and settle the liability simultaneously.

2.24 Provisions

Provisions for service warranties, make good obligation, and legal claims are recognized when the Group has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources will be required to settle the obligation and the amount can be reliably estimated. Provisions are measured at the present value of management’s best estimate of the expenditure required to settle the present obligation at the end of the reporting period, and the increase in the provision due to the passage of time is recognized as interest expense.

2.25 Greenhouse Gas Emissions Permits and Obligations

With enforcement of *The Act on the Allocation and Trading of Greenhouse Gas Emission Permits,* the permits that are received free of charge from the government are measured at zero while permits purchased are measured at acquisition cost and stated net of accumulated impairment loss. Emissions obligations are measured as the sum of the carrying amount of the allocated permits that will be submitted to the government and the best estimate of expenditure required to settle the obligation at the end of reporting period for any excess emission. The permits and emissions obligations are classified as intangible assets and provisions, respectively, in the consolidated statement of financial position.

2.26 Employee Benefits

(a) Post-employment benefits

The Group operates both defined contribution and defined benefit pension plans. For defined contribution plans, the Group pays contribution to publicly or privately administered pension insurance plans on mandatory, contractual or voluntary basis. The Group has no further payment obligation once the contribution has been paid. The contribution is recognized as employee benefit expense when they are due. A defined benefit plan is a pension plan that is not a defined contribution plan.

Generally, post-employment benefits are payable after the completion of employment, and the benefit amount depended on the employee's age, periods of service or salary levels. The liability recognized in the statement of financial position in respect of defined benefit pension plans is the present value of the defined benefit obligation at the end of the reporting period less the fair value of plan assets. The defined benefit obligation is calculated annually by independent actuaries using the projected unit credit method. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using interest rates of high-quality corporate bonds that are denominated in the currency in which the benefits will be paid, and that have terms approximating to the terms of the related obligation. Remeasurement gains and losses arising from experience adjustments and changes in actuarial assumptions are recognized in the period in which they occur, directly in other comprehensive income.

Changes in the present value of the defined benefit obligation resulting from plan amendments or curtailments are recognized immediately in profit or loss as past service costs.

(b) Other long-term employee benefits

Certain entities within the Group provide long-term employee benefits that are entitled to employees with service period for ten years and above. The expected costs of these benefits are accrued over the period of employment using the same accounting methodology as used for defined benefit pension plans. The Group recognizes service cost, net interest on other long-term employee benefits and remeasurements as profit or loss for the year. These liabilities are valued annually by an independent qualified actuary.

2.27 Revenue Recognition

(a) Identify performance obligation

With regard to the contract of selling products to the customer, the Group identifies the services provided separately to the customer as a different performance obligation. When the Group makes a sales contract with the customer, the standard warranty period for each product and customer is set up considering the legal warranty period. Even though the standard warranty period has been expired, the warranties are recognized as a revenue and is identified as a separate performance obligation when the Group provides additional warranties for the quality of product or when the customer has an option to purchase additional warranties separately.

(b) A performance obligation satisfied at a point in time

The revenue from the sale of goods is recognized at the time they are delivered to the customer. Delivery occurs when the products have been shipped to the specific location, the risks of obsolescence and loss have been transferred to the customer, and either the customer has accepted the products in accordance with the sales contract, the acceptance provisions have lapsed, or the group has objective evidence that all criteria for acceptance have been satisfied.

The goods are often sold with volume discounts, and it is the group's policy to sell its products to the customer with a right of return. Accumulated experience is used to estimate for the discounts and the refund, and the volume discounts is calculated based on the periodical forecast sales. The warranty provision for the sales and refund is reasonably estimated and recognized properly.

(c) Sales return

A gross contract liability for the expected refunds to customers is recognized as adjustment to revenue, and the Group has a right to recover the product from the customer where the customer exercises his right of return and recognizes an asset and a corresponding adjustment to cost of sales. A right to recover the products is measured at former carrying amount of the product less the costs to recover the products.

(d) Significant financing component

As a practical expedient, the Group does not adjust the promised amount of consideration for the effects of a significant financing component as the period between when the entity transfers a promised good or service to a customer and when the customer pays for that good or service is generally one year or less.

2.28 Lease

Lease income from operating leases where the Group is a lessor is recognized in income on a straight-line basis over the lease term. Initial direct costs incurred in obtaining an operating lease are added to the carrying amount of the underlying asset and recognized as expense over the lease term on the same basis as lease income. The respective leased assets are included in the statement of financial position based on their nature.

The Group leases various machinery, real estate and cars. Lease contracts are typically made for fixed periods, but may have extension options. Lease terms are negotiated on an individual basis and contain a wide range of different terms and conditions. The lease agreements do not impose any covenants, but leased assets may not be used as security for borrowing purposes.

Leases are recognized as a right-of-use asset and a corresponding liability at the date at which the leased asset is available for use by the Group. Each lease payment is allocated between the

liability and finance cost. The finance cost is charged to profit or loss over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period. The right-of-use asset is depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis.

Assets and liabilities arising from a lease are initially measured on a present value basis. Lease liabilities include the net present value of the following lease payments:

- Fixed payments (including in-substance fixed payments), less any lease incentives receivable
- Variable lease payment that are based on an index or a rate, initially measured using the index or rate as at the commencement date
- Amounts expected to be payable by the Group (the lessee) under residual value guarantees
- The exercise price of a purchase option if the Group (the lessee) is reasonably certain to exercise that option, and
- Payments of penalties for terminating the lease, if the lease term reflects the Group (the lessee) exercising that option

If the Group is reasonably certain to exercise a purchase option, the right-of-use asset is depreciated over the useful life of the underlying asset.

The lease payments are discounted using the interest rate implicit in the lease. If that rate cannot be determined, the lessee’s incremental borrowing rate is used, being the rate that the lessee would have to pay to borrow the funds necessary to obtain an asset of similar value in a similar economic environment with similar terms and conditions.

Right-of-use assets are measured at cost comprising the following:

- the amount of the initial measurement of lease liability
- any lease payments made at or before the commencement date less any lease incentives received
- any initial direct costs, and
- restoration costs

Payments associated with short-term leases or leases of low-value assets are recognized on a straight-line basis as an expense in profit or loss. Short-term leases are leases with a lease term of 12 months or less. Low-value assets comprise IT-equipment and small items of office furniture.

(a) Variable lease payments

Some property leases contain variable payment terms that are linked to sales generated from a warehouse. Variable lease payments that depend on usage are recognized in profit or loss in the period in which the condition that triggers those payments occurs.

(b) Extension and termination options

Extension and termination options are included in a number of leases across the Group. These terms are used to maximize operational flexibility in terms of managing contracts. The majority of extension and termination options held are exercisable only by the Group and not by the respective lessor.

The Group determines the lease term as the non-cancellable period of a lease within the period for which the contract is enforceable, together with both (a) periods covered by an option to extend the lease if the lessee is reasonably certain to exercise that option; and (b) periods covered by an option to terminate the lease if the lessee is reasonably certain not to exercise that option. When both lessee and lessor have the right to terminate the lease without permission from the other party, the Group considers the contractual termination payments in determining the period for which the contract is enforceable.

3. Financial Risk Management

3.1 Financial Risk Factors

The Group's activities expose it to a variety of financial risks: market risk, credit risk and liquidity risk. The Group's overall risk management program focuses on the unpredictability of financial markets and seeks to minimize potential adverse effects on the financial performance of the Group. The Group uses derivative financial instruments to hedge certain risk exposures.

Risk management is carried out by the Group's finance team under policies approved by the Corporate Management Committee. The finance team identifies, evaluates and hedges financial risks in close co-operation with the Group's operating units. The Corporate Management Committee reviews and approves written principles for overall risk management, as well as written policies covering specific areas, such as foreign exchange risk, interest rate risk, and credit risk, use of derivative financial instruments and non-derivative financial instruments, investment of excess liquidity.

(1) Market risk

1) Foreign exchange risk

The Group operates internationally and is exposed to foreign exchange risk arising from foreign currency exposures, primarily with respect to the US dollar. Foreign exchange risk arises from future commercial transactions, recognized assets and liabilities.

Management has set up a policy to require group companies to manage their foreign exchange risk against their functional currency. The Group manages maximum loss for currency risk exposures within acceptable range by using currency risk management model and hires employees who are exclusively responsible for currency risk management.

The Group has certain investments in foreign operations, whose net assets are exposed to foreign currency translation risk. Currency exposure arising from the net assets of the Group's foreign operations is managed primarily through borrowings denominated in the relevant foreign currencies.

As at December 31, 2020 and 2019, the Group's monetary assets and liabilities denominated in currencies other than its functional currency, are as follows:

(in millions of Korean won)	2020		2019	
	Assets	**Liabilities**	**Assets**	**Liabilities**
USD	4,367,761	3,805,638	2,681,402	3,321,586
EUR	244,382	4,479,131	275,799	3,157,509
JPY	20,035	303,704	30,081	208,998
CNY and others	343,749	8,199	693,284	8,231

As at December 31, 2020 and 2019, if the Group's functional currency had weakened / strengthened by 10% against the US dollar with all other variables held constant, profit before income tax would have been affected as follows:

(in millions of Korean won)	2020		2019	
	10% Increase	**10% Decrease**	**10% Increase**	**10% Decrease**
USD	77,289	(77,289)	(64,018)	64,018

The above sensitivity analysis has been performed for monetary assets and liabilities denominated in foreign currencies other than the Group's functional currency at the reporting date.

As at December 31, 2020, the Group entered into foreign currency forward contracts to manage risk from changes in exchange rates and the details are as follows:

(in millions of Korean won and in millions of US dollars)						Book amount	
	Contractor	**Contract amount**	**Contract exchange rate**	**Contract inception date**	**Contract maturity**	**Assets**	**Liabilities**
Currency forward[1]	Shinhan Bank	USD 500	1,135.60	2020.10.14	2024.10.15	-	23,115
	KB Kookmin Bank	USD 500	1,102.83	2020.11.24	2029.04.16	-	18,653

[1] A derivative instrument which is not subject to hedging

2) Price risk

The Group is exposed to equity securities price risk arises from investments held by the Group and classified in the consolidated interim statement of financial position as non-current financial assets. The Group's equity investments are publicly traded and are related to the NASDAQ index.

The table below summarizes the impact of increases/decreases of the listed stock price index on the Group's equity before tax effects as at December 31, 2020 and 2019. The analysis is based on the assumption that the equity index has increased/decreased by 10% with all other variables held constant, and that all the Group's equity instruments moved in line with the index.

(in millions of Korean won)	2020		2019	
	10% Increase	**10% Decrease**	**10% Increase**	**10% Decrease**
KOSDAQ	-	-	676	(676)
NASDAQ	997	(997)	819	(819)
HSI	-	-	7,944	(7,944)
Total	997	(997)	9,439	(9,439)

3) Interest rate risk

Interest rate risk is defined as the risk that the interest income or expenses arising from deposits and borrowings will fluctuate because of changes in future market interest rate. The interest rate risk mainly arises through floating rate deposits and borrowings. The objective of interest rate risk management lies in maximizing corporate value by minimizing uncertainty in interest rates fluctuations and net interest expense.

The Group adequately minimizes risks from interest rate fluctuations through various policies, such as sharing excess cash within the Group (internal cash sharing) to minimize external borrowings, avoiding high rate borrowings, reforming capital structure, managing an appropriate ratio of fixed rate borrowings and floating rate borrowings, monitoring a fluctuation of domestic and foreign interest rates daily, weekly and monthly, establishing alternatives, and balancing floating rate short-term borrowings with floating rate deposits.

The table below summarizes the impact of increases/decreases of interest rate on the Group's equity and post-tax profit for the year. The analysis is based on the assumption that the interest rate has increased/decreased by 1% (100 basis points) with all other variables held constant.

(in millions of Korean won)	Impact on post-tax profit		Impact on equity	
	2020	**2019**	**2020**	**2019**
Increase	(36,812)	(22,265)	(36,812)	(22,265)
Decrease	36,812	22,265	36,812	22,265

(2) Credit risk

Credit risk arises from trade receivables and that the Group holds, as well as debt instruments at amortized cost or fair value through other comprehensive income.

1) Trade receivables

The Group applies the simplified approach to measuring expected credit losses which uses a lifetime expected loss allowance for trade receivables. To measure the expected credit losses, trade receivables have been grouped based on shared credit risk characteristics and the days past due. The loss allowance provision as at December 31, 2020 is as follows. Expected credit losses include forward-looking information.

(in millions of Korean won)	Receivables not past due[1]	Receivables past due but not impaired[1]	Impaired receivables[2]	Total
December 31, 2020 (trade receivables)				
Gross carrying amount	4,835,299	493,371	3,462	5,332,132
Expected loss rate	0.0%	0.1%	54.7%	0.1%
Loss allowance provision	2,032	467	1,892	4,391
December 31, 2019 (trade receivables)				
Gross carrying amount	3,005,591	729,226	9,237	3,744,054
Expected loss rate	0.1%	0.1%	31.3%	0.2%
Loss allowance provision	2,111	829	2,890	5,830

[1] See Note 7.(3) for aging analysis.
[2] Impaired receivables are those for which impairment indicators have been confirmed, such as significant lack of collectability.

Movements in the loss allowance provision for trade receivables for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	Trade receivables	
	2020	**2019**
Beginning balance	5,830	7,910
Reversal of loss allowance recognized in profit or loss	(480)	(903)
Receivables written off as uncollectible	(833)	(1,164)
Exchange differences	(126)	(13)
Ending balance	4,391	5,830

As at December 31, 2020, the carrying amount of trade receivables representing the maximum exposure to credit risk amounts to ₩5,332,132 million (2019: ₩3,744,054 million).

2) Other financial assets at amortized cost

Movements in loss allowance provision for other financial assets at amortized cost for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	Other receivables	
	2020	**2019**
Beginning balance	2,109	2,726
Increase in loss allowance recognized as 'other non-operating expenses' in profit or loss	2	(630)
Exchange differences	54	13
Ending balance	2,165	2,109

All of the financial assets at amortized costs are considered to have low credit risk, and the loss allowance recognized during the period was, therefore, limited to 12 months expected losses.

Debt investments measured at fair value through other comprehensive income include trade receivables to be discounted. For these investments, changes in fair value are accumulated within the financial assets at fair value through other comprehensive income reserve within equity. The accumulated changes in fair value are transferred to profit or loss when the investment is impaired.

The Group has established the following policies and procedures to manage credit risks.

To manage credit risks relating to trade receivables, the Group evaluates the credit rating of customers and determines credit limit for each customer based on the information provided by credit rating agencies and other available financial information before commencing business with new customers. The credit risks relating to trade receivables are also mitigated by insurance contracts, collateral as well as payment guarantees.

The Group has entered into export bond insurance contracts with Korea Trade Insurance Corporation to mitigate credit risks relating to export trade receivables to overseas customers. The Group is also provided with collateral by customers depending on their credit rating or payment guarantees from the customers' financial institutions if necessary.

The Group has deposited its cash and cash equivalents and other long-term deposits in several financial institutions, such as Woori Bank and others. The Group has also entered into derivative contract with several financial institutions. The Group maintains business relationship with those financial institutions with high credit ratings evaluated by independent credit rating agencies and accordingly, credit risks associated with these financial institutions are limited.

(3) Liquidity risk

Finance team of the Group monitors rolling forecasts of the Group's liquidity requirements to ensure it has sufficient cash to meet operational needs while maintaining sufficient headroom on its undrawn committed borrowing facilities at all times so that the Group does not breach borrowing limits or covenants (where applicable) on any of its borrowing facilities. The Group's liquidity management policy involves projecting cash flows in major currencies and considering the level of liquid assets necessary to meet these, monitoring balance sheet liquidity ratios against internal and external regulatory requirements and maintaining debt financing plans.

The table below analyzes the Group's non-derivative financial liabilities into relevant maturity groupings based on the remaining period at the reporting period to the contractual maturity date. Cash flows presented below are gross cash flows before discount, and includes cash flows for interests.

(in millions of Korean won)	2020			
	Less than 1 year	**Between 1-2 years**	**Between 2-5 years**	**Over 5 years**
Borrowings (excluding lease liabilities)	1,665,869	1,876,344	4,941,527	2,239,926
Lease liabilities	59,636	33,536	44,091	75,581
Trade and other payables[1]	8,725,500	11,756	-	171
Total	10,451,005	1,921,636	4,985,618	2,315,678
Derivative instruments				
Gross settlement currency forwards				
(Inflows)	-	-	(544,000)	(544,000)
Outflows	-	-	567,800	551,415
	-	-	23,800	7,415
Total	10,451,005	1,921,636	5,009,418	2,323,093

(in millions of Korean won)	2019			
	Less than 1 year	**Between 1-2 years**	**Between 2-5 years**	**Over 5 years**
Borrowings (excluding finance lease liabilities)	1,463,659	1,445,986	4,060,071	1,976,074
Finance lease liabilities	64,481	41,132	79,703	114,050
Trade and other payables[1]	6,522,664	10,787	43	121
Total	8,050,804	1,497,905	4,139,817	2,090,245

[1] Included ₩2,099,936 million (2019: ₩862,452 million) of financial liabilities due to a financial institution relating to reverse factoring arrangement. The Group has entered into reverse factoring arrangement (interest rate CD 91 days + 0.92~1.04%) with a financial institution whereby suppliers receive payments from the financial institution on the due date of each invoice and the Group pays to the financial institution at the end of extended credit period as agreed in the reverse factoring arrangement.

As at December 31, 2020, the Group has entered into swap contracts for which cash flow hedge accounting is applied, to avoid market price fluctuation of raw materials.

(in millions of Korean won)	2020				
	Purpose of the contracts	**Hedged items**	**Financial institution**	**Maturity**	**Fair value**
Merchandise (raw materials) swap[1]	Cash flow hedge	Non-ferrous metal	Citi bank	~2021. 12	23,821

Details of derivative assets and liabilities as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020		2019	
	Assets	**Liabilities**	**Assets**	**Liabilities**
Merchandise (raw materials) swap[1]	23,821	-	21,371	-
Total	23,821	-	21,371	-

[1] Gain (loss) resulting from the contracts to avoid cash flow fluctuation risk of expected future transaction is accounted for as accumulated other comprehensive income (Note 5).

3.2 Capital Risk Management

The Group's objectives for managing capital are to safeguard the Group's ability to continue as a going concern, so the Group can continue to provide returns for shareholders and benefits for other stakeholders, and to maintain an optimal capital structure to reduce the cost of capital.

Consistent with others in the industry, the Group monitors capital on the basis of the gearing ratio. This ratio is calculated as net debt divided by total capital. Net debt is calculated as total borrowings less cash and cash equivalents. Total capital is calculated as 'equity' as shown in the consolidated statement of financial position plus net debt.

The gearing ratio and debt-to-equity ratio as at December 31, 2020 and 2019, were as follows:

(in millions of Korean won, except for ratios)	**2020**	**2019**
Total borrowings (Note 14) (A)	10,186,117	8,414,268
Less: cash and cash equivalents (B)	(3,274,250)	(1,888,631)
Net debt (C=A+B)	6,911,867	6,525,637
Total liabilities (D)	22,598,454	16,640,637
Total equity (E)	18,790,440	17,383,789
Total capital (F=C+E)	25,702,307	23,909,426
Gearing ratio (C/F)	26.9%	27.3%
Debt-to-equity ratio (D/E)	120.3%	95.7%

3.3 Fair Value

(1) Carrying amount and fair value of financial instruments by category as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020		2019	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial assets (current)				
Cash and cash equivalents	3,274,250	[1]	1,888,631	[1]
Deposits held by financial institutions	608,039	[1]	32,515	[1]
Trade receivables	5,298,365	[1]	3,738,224	[1]
Other receivables (excluding deposits held by financial institutions)	316,264	[1]	234,036	[1]
Current derivative financial assets	23,821	23,821	10,879	10,879
Financial assets (non-current)				
Deposits held by financial institutions	167,054	[1]	107,434	[1]
Trade receivables	29,376	[1]	-	-
Other receivables (excluding deposits held by financial institutions)	87,976	[1]	65,499	[1]
Other non-current financial assets (carried at fair value)				
Marketable financial assets	7,679	7,679	83,174	83,174
Non-marketable financial assets[2]	73,853	73,853	66,289	66,289
Non-current derivative financial assets	-	-	10,492	10,492
Financial liabilities (current)				
Trade and other payables	8,725,500	[1]	6,522,664	[1]
Current borrowings (excluding exchangeable bonds and lease liabilities)	1,460,926	[1]	1,300,989	[1]
Current borrowings (exchangeable bonds)	32,500	32,763	-	-
Current lease liabilities	55,389	[3]	55,108	[3]
Current derivative financial liabilities (exchange rights)	16,797	16,797	-	-
Financial liabilities (non-current)				
Non-current borrowings (excluding lease liabilities)	8,508,066	8,614,889	6,836,034	7,042,233
Non-current lease liabilities	129,236	[3]	222,137	[3]
Other non-current payables	11,927	[1]	10,951	[1]
Other non-current derivative financial liabilities (currency forward)	41,768	41,768	-	-
Other non-current derivative financial liabilities (exchange rights)	-	-	930	930

[1] These financial assets and liabilities are not included in the disclosure above as their carrying amount is a reasonable approximation of the fair value.
[2] Acquisition costs of these financial assets approximate their fair values.

[3] Fair values for these financial assets and liabilities are not disclosed above in accordance with related Korean IFRS.

(2) Fair value for measurement and disclosure are determined based on the following method:

Fair values of financial liabilities (non-current) are based on cash outflows discounted by using Korean won currency note yield in the same credit grade with the Parent Company (AA+), and the applied discount rates as at December 31, 2020 and 2019, are as follows:

(in percentage)	**2020**	**2019**
Discount rate	0.97% ~ 2.27%	1.63% ~ 2.24%

(3) Fair value hierarchy

Items that are measured at fair value are categorized by the fair value hierarchy levels, and the defined levels are as follows:

- Quoted prices (unadjusted) in active markets for identical assets or liabilities that an entity can access at the measurement date (Level 1).
- All inputs other than quoted prices included in level 1 that are observable (either directly that is, prices, or indirectly that is, derived from prices) for the asset or liability (Level 2).
- Unobservable inputs for the asset or liability (Level 3).

Fair value hierarchy classifications of the financial instruments that are measured at fair value or their fair value are disclosed as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**			
	Level 1	**Level 2**	**Level 3**	**Total**
Financial assets/liabilities measured at fair value				
Other non-current financial assets (marketable financial assets)	7,679	-	-	7,679
Other non-current financial assets (non-marketable financial assets)	-	-	73,853	73,853
Current derivative financial assets	-	23,821	-	23,821
Current derivative financial liabilities (exchange rights)	-	-	16,797	16,797
Current derivative financial liabilities (currency forward)	-	41,768	-	41,768
Financial assets/liabilities not measured at fair value				
Current borrowings (exchangeable bonds)	-	-	32,763	32,763
Non-current borrowings (excluding lease liabilities)	-	8,614,889	-	8,614,889

(in millions of Korean won)	2019			
	Level 1	**Level 2**	**Level 3**	**Total**
Financial assets/liabilities measured at fair value				
Other non-current financial assets (marketable financial assets)	83,174	-	-	83,174
Other non-current financial assets (non-marketable financial assets)	-	-	66,289	66,289
Current derivative financial assets	-	10,879	-	10,879
Non-current derivative financial assets	-	10,492	-	10,492
Non-current financial liabilities (exchange rights) [1]	-	-	930	930
Financial assets/liabilities not measured at fair value				
Non-current borrowings (excluding lease liabilities)	-	6,390,480	651,753	7,042,233

[1] Movements in exchange rights are as follows.

(in millions of Korean won)	USD		EUR		Total	
	2020	**2019**	**2020**	**2019**	**2020**	**2019**
Beginning Balance	42	14,350	888	16,034	930	30,384
Exchange	(89,961)	-	(188,303)	-	(278,264)	-
Redemption	(70)	-	-	-	(70)	-
Evaluation	89,989	(14,308)	204,212	(15,146)	294,201	(29,454)
Ending Balance	-	42	16,797	888	16,797	930

(4) Valuation technique and the inputs

Valuation techniques and inputs used in level 3 fair value measurements are as follows:

(in millions of Korean won)	2020				
	Fair value	**Level**	**Valuation Technique**	**Inputs**	**Coverage of Level 3 inputs**
Financial liabilities – Exchangeable Bond					
Exchangeable Bond	32,763	3	Binominal option pricing model	Annual rates of credit volatility	-0.5%p ~ +0.5%p
Exchange right	16,797	3	Binominal option pricing model	Annual rates of credit volatility	-0.5%p ~ +0.5%p
				Underlying asset (equity) volatility	-5.0% ~ +5.0%

(in millions of Korean won)	2019				
	Fair value	**Level**	**Valuation Technique**	**Inputs**	**Coverage of Level 3 inputs**
Financial liabilities					
– Exchangeable ond					
Exchangeable Bond	651,753	3	Binominal option pricing model	Annual rates of credit volatility	-0.5%p ~ +0.5%p
Exchange right	930	3		Annual rates of credit volatility	-0.5%p ~ +0.5%p
			Binominal option pricing model	Underlying asset (equity) volatility	-5.0% ~ +5.0%

(5) Sensitivity analysis for recurring fair value measurements categorized within Level 3

Sensitivity analysis of financial instruments is performed to measure favorable and unfavorable changes in the fair value of financial instruments which are affected by the unobservable parameters, using a statistical technique. When the fair value is affected by more than two input parameters, the most favorable or most unfavorable amounts are presented.

The results of the sensitivity analysis for the effect on profit or loss from changes in inputs for exchangeable bonds categorized as level 3 and subject to sensitivity analysis, are as follows:

(in millions of Korean won)	2020	
	The effect on profit	**The effect on loss**
Financial liabilities		
– Exchangeable Bond		
Annual rates of credit volatility	47	(48)
Financial liabilities		
– Exchange right		
Annual rates of credit volatility	40	(41)
Underlying asset (equity) volatility	44	(129)

(in millions of Korean won)	2019	
	The effect on profit	**The effect on loss**
Financial liabilities		
– Exchangeable Bond		
Annual rates of credit volatility	4,130	(4,177)
Financial liabilities		
– Exchange right		
Annual rates of credit volatility	112	(107)
Underlying asset (equity) volatility	497	(580)

4. Critical Accounting Estimates and Assumptions

The preparation of financial statements requires the Group to make estimates and assumptions concerning the future. Management also needs to exercise judgement in applying the Group's accounting policies. Estimates and assumptions are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. The resulting accounting estimates may differ from the related actual results. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below.

The spread of COVID-19 during 2020 has impacted significantly on the domestic and international economies. Also, this may affect the Group's financial position and business performance.

Significant accounting estimates and assumptions used in the preparation of financial statements may be adjusted according to fluctuations in uncertainty arising from COVID-19, and the ultimate impact of COVID-19 on the Group's business, financial position, and performance is currently unpredictable.

(a) Impairment test of goodwill

The Group tests whether goodwill has suffered any impairment on an annual basis. The recoverable amount of a cash generating unit (CGU) is determined based on value-in-use or fair value less cost of disposal calculations (Note 12).

(b) Income taxes

If certain portion of the taxable income is not used for investments or increase in wages or dividends in accordance with the *Tax System for Recirculation of Corporate Income*, the Group is liable to pay additional income tax calculated based on the tax laws. The new tax system is effective for three years from 2015. Accordingly, the measurement of current and deferred income tax is affected by the tax effects from the new tax system. As the Group's income tax is dependent on the investments, increase in wages and dividends, there is an uncertainty measuring the final tax effects.

(c) Provisions

The Group recognizes provisions for product warranties as explained in Note 15. These provisions are estimated based on the past experience. Provisions related to voluntary recall by the Group's customer are estimated based on the number of vehicles subject to recall, estimated total repair costs, and cost sharing ratio.

(d) Fair value of financial instruments

The fair value of financial instruments that are not traded in an active market is determined by using valuation techniques. The Group uses its judgment to select a variety of methods and make assumptions that are mainly based on market conditions existing at the end of each reporting period (Note 3.3).

(e) Impairment of financial assets

The provision for impairment for financial assets are based on assumptions about risk of default and expected loss rates. The Group uses judgement in making these assumptions and selecting the inputs to the impairment calculation based on the Group's past experience, existing market

conditions as well as forward looking estimates at the end of each reporting period (Note 3.1.(2)).

(f) Net defined benefit liability

The present value of net defined benefit liability depends on a number of factors that are determined on an actuarial basis using a number of assumptions including the discount rate (Note 16).

(g) Lease

In determining the lease term, management considers all facts and circumstances that create an economic incentive to exercise an extension option, or not exercise a termination option. Extension options (or periods after termination options) are only included in the lease term if the lease is reasonably certain to be extended (or not terminated).

The lease term is reassessed if an option is actually exercised (or not exercised) or the Group becomes obliged to exercise (or not exercise) it. The assessment of reasonable certainty is only revised if a significant event or a significant change in circumstances occurs, which affects this assessment, and that is within the control of the lessee.
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5. Financial Instruments by Category

Categorizations of financial instruments as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020				
Financial assets	**Financial assets at amortized cost**	**Financial assets at fair value through profit or loss**	**Financial assets at fair value through other comprehensive income**	**Other financial assets[1]**	**Total**
Cash and cash equivalents	3,274,250	-	-	-	3,274,250
Trade receivables	4,876,565	-	421,800	-	5,298,365
Non-current trade receivables	29,376				29,376
Other receivables	904,640	-	19,663	-	924,303
Other non-current receivables	255,030	-	-	-	255,030
Other current financial assets	-	-	-	23,821	23,821
Other non-current financial assets	-	29,316	52,216	-	81,532
Total	9,339,861	29,316	493,679	23,821	9,886,677

(in millions of Korean won)	2020			
Financial liabilities	**Financial liabilities at fair value through profit or loss**	**Financial liabilities at amortized cost**	**Other financial liabilities[2]**	**Total**
Trade payables	-	3,458,526	-	3,458,526
Other payables	-	5,266,974	-	5,266,974
Borrowings (current)	-	1,493,426	55,389	1,548,815
Other current financial liabilities	16,797	-	-	16,797
Other non-current financial liabilities	-	-	41,768	41,768
Other non-current payables	-	11,927	-	11,927
Borrowings (non-current)	-	8,508,066	129,236	8,637,302
Total	16,797	18,738,919	226,393	18,982,109

(in millions of Korean won)

	2019				
Financial assets	**Financial assets at amortized cost**	**Financial assets at fair value through profit or loss**	**Financial assets at fair value through other comprehensive income**	**Other financial assets[1]**	**Total**
Cash and cash equivalents	1,888,631	-	-	-	1,888,631
Trade receivables	3,114,376	-	623,848	-	3,738,224
Other receivables	259,204	-	7,347	-	266,551
Other non-current receivables	172,933	-	-	-	172,933
Other current financial assets	-	-	-	10,879	10,879
Other non-current financial assets	-	24,613	124,850	10,492	159,955
Total	5,435,144	24,613	756,045	21,371	6,237,173

(in millions of Korean won)

	2019			
Financial liabilities	**Financial liabilities at fair value through profit or loss**	**Financial liabilities at amortized cost**	**Other financial liabilities[2]**	**Total**
Trade payables	-	2,379,711	-	2,379,711
Other payables	-	4,142,953	-	4,142,953
Borrowings (current)	-	1,300,989	55,108	1,356,097
Other non-current financial liabilities	930	-	-	930
Other non-current payables	-	10,951	-	10,951
Borrowings (non-current)	-	6,836,034	222,137	7,058,171
Total	930	14,670,638	277,245	14,948,813

[1] Other financial assets include derivative assets.
[2] Other financial liabilities include lease liabilities and derivative liabilities.

Net gains or losses on each category of financial instruments for the three-month and nine-month periods ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Dividend income		
Financial assets at fair value through other comprehensive income	2,562	1,724
Interest income		
Financial assets at amortized cost	35,927	48,789
Interest expense		
Financial liabilities at amortized cost	(232,514)	(214,388)
Other financial liabilities	(9,578)	(3,593)
Financial assets at amortized cost[1]	(912)	(4,247)
Financial assets at fair value through other comprehensive income[1]	(2,874)	(8,101)
Gain (loss) on valuation		
Financial assets at fair value through profit or loss	3,898	16
Financial assets at fair value through other comprehensive income	3,024	35,398
Derivative instruments	(322,967)	69,303
Exchange differences		
Financial assets at amortized cost	(360,502)	67,810
Financial liabilities at amortized cost	258	(66,523)
Other financial liabilities	(10,522)	190

[1] Fees paid to financial institutions for factoring.

6. Cash and Cash Equivalents

Details of cash and cash equivalents as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Bank deposits and cash on hand	1,704,420	902,764
Deposits held by financial institutions and others	1,569,830	985,867
Total	3,274,250	1,888,631

As at December 31, 2020, cash and cash equivalents include ₩39,317 million which is subject to a restriction on the use in association with the national R&D projects.

7. Trade and Other Receivables

Trade and other receivables and its provisions for impairment, as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020		
	Gross amount	**Provision for impairment**	**Carrying amount**
Trade receivables	5,302,756	(4,391)	5,298,365
Non-current trade receivables	29,376	-	29,376
Other current receivables	926,468	(2,165)	924,303
Other non-current receivables	255,030		255,030
Total	6,513,630	(6,556)	6,507,074

(in millions of Korean won)	2019		
	Gross amount	**Provision for impairment**	**Carrying amount**
Trade receivables	3,744,054	(5,830)	3,738,224
Non-current trade receivables	-	-	-
Other current receivables	268,660	(2,109)	266,551
Other non-current receivables	172,933	-	172,933
Total	4,185,647	(7,939)	4,177,708

Details of other receivables as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Current		
Non-trade receivables	271,651	195,182
Deposits held by financial institutions	608,039	32,515
Accrued income	2,567	2,317
Guarantee deposits provided	42,046	36,537
	924,303	266,551
Non-current		
Non-trade receivables	24,910	-
Deposits held by financial institutions[1]	167,054	107,434
Loans	831	677
Guarantee deposits provided	62,235	64,822
	255,030	172,933
Total	1,179,333	439,484

[1] As at December 31, 2020, ₩166,100 million (2019: ₩106,600 million) is restricted from being withdrawn in relation to large, small and medium-sized companies cooperation agreement and others. In addition, ₩928 million is restricted from withdrawal in connection with maintaining checking accounts (2019: ₩808 million).

The aging analysis of trade and other receivables as at December 31, 2020 and 2019, is as follows:

(in millions of Korean won)	2020		2019	
	Trade receivables	Other receivables	Trade receivables	Other receivables
Receivables not past due	4,835,299	1,134,863	3,005,591	378,107
Past due but not impaired				
Up to 3 months	333,522	41,780	554,620	43,891
Between 3-6 months	69,272	353	153,457	7,107
Over 6 months	90,577	2,337	21,149	5,578
	493,371	44,470	729,226	56,576
Impaired receivables	3,462	2,165	9,237	6,910
Total	5,332,132	1,181,498	3,744,054	441,593

Movements on the provision for impairment of trade and other receivables for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	5,830	-	2,109	-
Additions (reversal)	(480)	-	2	-
Write-off	(833)	-	-	-
Exchange differences	(126)	-	54	-
Ending balance	4,391	-	2,165	-

(in millions of Korean won)	2019			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	7,910	-	2,726	-
Reversal	(903)	-	(630)	-
Write-off	(1,164)	-	-	-
Exchange differences	(13)	-	13	-
Ending balance	5,830	-	2,109	-

As at December 31, 2020 and 2019, the carrying amounts of trade and other receivables are approximation of their fair values.

The Group transferred trade and other receivables to financial institutions for ₩168,781 million at December 31, 2020 (2019: ₩820,426 million), and derecognized the trade and other receivables from the financial statements at the date of disposal, as substantial all the risks and rewards were transferred.

8. Other Financial Assets and Liabilities

Details of other financial assets and liabilities as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Other financial assets		
Derivative financial assets (forward contract) (current)	23,821	10,879
Financial assets at fair value through other comprehensive income (excluding forward contract) (non-current)	52,216	124,850
Derivative financial assets (forward contract) (non-current)	-	10,492
Financial assets at fair value through profit or loss (excluding forward contract) (non-current)	29,316	24,613
	105,353	170,834
Other financial liabilities		
Financial liabilities at fair value through profit or loss (exchange rights) (current)	16,797	-
Financial liabilities at fair value through profit or loss (exchange rights) (non-current)	-	930
Financial liabilities at fair value through profit or loss (forward contract) (non-current)	41,768	-
	58,565	930

Changes in equity and debt instruments included in other financial assets for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Beginning balance	149,463	93,350
Acquisitions / transfer	18,120	23,572
Disposals	(91,251)	(2,873)
Gain on valuation (before income tax effects) through other comprehensive income	3,024	35,315
Gain on valuation (before income tax effects) through profit or loss	3,898	-
Others	(1,722)	99
Ending balance	81,532	149,463

During the years ended December 31, 2020 and 2019, the Group did not recognize impairment for other financial assets.

9. Inventories

Details of inventories as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020		
	Gross amount	**Valuation allowance**	**Carrying amount**
Merchandise	130,457	(3,486)	126,971
Finished / Semi-finished products	3,087,998	(129,308)	2,958,690
Work-in-process	23,570	-	23,570
Raw materials	1,277,855	(17,100)	1,260,755
Supplies	188,503	-	188,503
Materials-in-transit	791,199	-	791,199
Total	5,499,582	(149,894)	5,349,688

(in millions of Korean won)	2019		
	Gross amount	**Valuation allowance**	**Carrying amount**
Merchandise	179,572	(4,880)	174,692
Finished / Semi-finished products	2,821,981	(134,101)	2,687,880
Work-in-process	11,561	-	11,561
Raw materials	1,213,481	(18,669)	1,194,812
Supplies	177,535	-	177,535
Materials-in-transit	787,241	-	787,241
Total	5,191,371	(157,650)	5,033,721

During the year ended December 31, 2020, the cost of inventories recognized as expense and included in 'cost of sales' amounted to ₩17,678,492 million (2019: ₩16,541,239 million).

10. Investments in Associates and Joint Ventures

Changes in investments in associates and joint ventures for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020							
	Beginning balance	**Acquisitions / transfer**	**Dividends**	**Share of profit (loss) of associates and joint ventures**	**Share of other comprehensive income (loss) of associates and joint ventures**	**Impairment / disposals**	**Others**	**Ending balance**
LG VINA Chemical Co., Ltd.	4,403	-	-	1,782	(310)	-	-	5,875
HL Greenpower Co., Ltd.	23,366	-	-	(664)	-	-	8	22,710
LG Holdings (HK) Ltd.[1]	40,973	-	-	436	(369)	(41,040)	-	-
TECHWIN Co., Ltd.	19,376	-	(314)	1,053	(2)	-	-	20,113
SEETEC Co., Ltd	142,554	-	(10,000)	7,205	-	-	357	140,116
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	-	579
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	-	150
FJ Composite Materials Co., LTD.	2,171	-	-	(142)	(162)	-	870	2,737
WUXI CL New Energy Technology Ltd[2]	-	-	-	-	-	-	-	-
LG Life Sciences Poland Ltd.	17	-	-	-	-	-	-	17
Combustion Synthesis Co., Ltd.	2,042	-	-	(88)	(68)	-	(19)	1,867
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.[3]	67,058	22,191	-	151	125	-	-	89,525
VINFAST LITHIUM BATTERY PACK LIMITED LIABILITY COMPANY	4,888	-	-	(461)	(248)	-	-	4,179
Jiangxi VL Battery Co.,Ltd[4]	-	21,815	-	71	(425)	-	-	21,461
	307,577	44,006	(10,314)	9,343	(1,459)	(41,040)	1,216	309,329

(in millions of Korean won)	2019							
	Beginning balance	Acquisitions / transfer	Dividends	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income (loss) of associates and joint ventures	Impairment / disposals	Others	Ending balance
LG VINA Chemical Co., Ltd.	4,479	-	-	(348)	272	-	-	4,403
HL Greenpower Co., Ltd.	19,565	-	-	3,919	-	-	(118)	23,366
LG Holdings (HK) Ltd.	54,735	-	-	3,993	(1,967)	-	(15,788)	40,973
TECHWIN Co., Ltd.	9,828	-	-	9,563	(15)	-	-	19,376
SEETEC Co., Ltd	145,649	-	(10,000)	6,919	-	-	(14)	142,554
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	-	579
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	-	150
FJ Composite Materials Co., LTD.	2,315	-	-	(240)	96	-	-	2,171
WUXI CL New Energy Technology Ltd.	1,288	-	-	(1,336)	48	-	-	-
LG Life Sciences Poland Ltd.	17	-	-	-	-	-	-	17
Combustion Synthesis Co., Ltd.	1,397	645	-	(289)	220	-	69	2,042
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	26,120	41,202	-	222	(486)	-	-	67,058
VINFAST LITHIUM BATTERY PACK LIMITED LIABILITY COMPANY	-	5,323	-	(192)	(243)	-	-	4,888
	266,122	47,170	(10,000)	22,211	(2,075)	-	(15,851)	307,577

[1] During the year ended December 31, 2020, LG Holdings (HK) Ltd. was disposed.
[2] As at December 31, 2020, the Group discontinued recognizing its share of further losses as its share of losses of an associate exceeds the carrying amount of its interest in the associate. Unrecognized accumulated losses amounted to ₩320 million.
[3] During the year ended December 31, 2020, the Parent Company acquired additional shares of HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD. for ₩ 22,191 million.
[4] During the year ended December 31, 2020, the Parent Company newly acquired 34% shares of Jiangxi VL Battery Co., Ltd. for ₩ 21,815 million.

11. Property, Plant and Equipment

Changes in property, plant and equipment for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020											
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Right-of-use assets	Construction-in-progress	Machinery-in-transit	Total
Beginning balance	1,759,528	3,890,961	957,739	6,348,867	6,261	601,958	163,470	175,122	319,620	4,210,088	160,028	18,593,642
Cost	1,796,480	4,769,924	1,583,401	17,044,880	33,056	1,457,840	467,293	378,823	380,814	4,300,788	160,028	32,373,327
Accumulated depreciation	-	(839,904)	(609,282)	(10,486,289)	(26,648)	(843,955)	(301,041)	(197,978)	(61,119)	-	-	(13,366,216)
Accumulated impairment	(36,952)	(39,059)	(16,380)	(209,724)	(147)	(11,927)	(2,782)	(5,723)	(75)	(90,700)	-	(413,469)
Acquisitions/ transfer	14,436	1,137,678	106,976	3,243,373	6,365	282,554	87,682	39,256	109,307	5,168,221	258,957	10,454,805
Disposals/ transfer	(681)	(18,922)	(1,655)	(66,721)	(38)	(25,298)	(4,352)	(2,398)	(8,165)	(5,421,750)	(72,815)	(5,622,795)
Exchange differences	(1,244)	29,214	887	(63,136)	(192)	(873)	108	1	(1,353)	(55,703)	-	(92,291)
Depreciation	-	(145,120)	(60,365)	(1,510,695)	(2,390)	(190,550)	(51,930)	(99,491)	(70,534)	-	-	(2,131,075)
Impairment	-	(5,542)	(8,639)	(47,769)	(57)	(10,148)	(627)	(195)	(86)	(2,716)	(259)	(76,038)
Reversal of impairment	-	-	-	-	-	-	-	-	-	220	-	220
Transfer to assets held for sale	-	(67,255)	(9,753)	(330,903)	(29)	(12,302)	(9,138)	-	(117,935)	(11,678)	-	(558,993)
Ending balance	1,772,039	4,821,014	985,190	7,573,016	9,920	645,341	185,213	112,295	230,854	3,886,682	345,911	20,567,475
Cost	1,808,991	5,794,729	1,677,231	18,812,951	36,372	1,579,923	511,358	413,150	348,412	3,968,793	345,911	35,297,821
Accumulated depreciation	-	(931,321)	(667,122)	(11,062,720)	(26,346)	(922,831)	(322,812)	(294,937)	(117,522)	-	-	(14,345,611)
Accumulated impairment	(36,952)	(42,394)	(24,919)	(177,215)	(106)	(11,751)	(3,333)	(5,918)	(36)	(82,111)	-	(384,735)

(in millions of Korean won)	2019											
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Right-of-use assets	Construction-in-progress	Machinery-in-transit	Total
Beginning balance	1,620,153	3,187,757	827,775	4,691,884	12,865	471,130	149,599	115,901	-	2,588,018	174,116	13,839,198
Cost	1,657,105	3,959,198	1,407,903	14,412,619	41,803	1,233,217	420,342	315,049	-	2,641,276	174,116	26,262,628
Accumulated depreciation	-	(735,173)	(566,151)	(9,564,688)	(28,783)	(750,202)	(268,298)	(196,996)	-	-	-	(12,110,291)
Accumulated impairment	(36,952)	(36,268)	(13,977)	(156,047)	(155)	(11,885)	(2,445)	(2,152)	-	(53,258)	-	(313,139)
Changes in accounting policies	-	-	(17,697)	(9,668)	-	-	-	-	175,599	-	-	148,234
Restated beginning balance	1,620,153	3,187,757	810,078	4,682,216	12,865	471,130	149,599	115,901	175,599	2,588,018	174,116	13,987,432
Acquisitions/ Transfer	150,097	841,640	207,263	3,053,495	6,021	311,322	62,487	144,766	180,963	6,767,527	195,797	11,921,378
Disposals/ Transfer	(10,846)	(40,096)	(3,436)	(92,420)	(10,139)	(15,174)	(2,776)	(173)	(3,890)	(5,117,686)	(208,708)	(5,505,344)
Exchange differences	124	18,966	1,665	20,526	30	2,012	613	-	2,380	11,305	-	57,621
Depreciation	-	(114,179)	(55,546)	(1,221,114)	(2,518)	(166,457)	(46,032)	(81,801)	(35,357)	-	-	(1,723,004)
Impairment	-	(3,139)	(2,297)	(74,968)	-	(828)	(429)	(3,571)	(75)	(39,076)	(1,177)	(125,560)
Reversal of impairment	-	12	12	181	2	-	8	-	-	-	-	215
Transfer to assets held for sale	-	-	-	(19,049)	-	(47)	-	-	-	-	-	(19,096)
Ending balance	1,759,528	3,890,961	957,739	6,348,867	6,261	601,958	163,470	175,122	319,620	4,210,088	160,028	18,593,642
Cost	1,796,480	4,769,924	1,583,401	17,044,880	33,056	1,457,840	467,293	378,823	380,814	4,300,788	160,028	32,373,327
Accumulated depreciation	-	(839,904)	(609,282)	(10,486,289)	(26,648)	(843,955)	(301,041)	(197,978)	(61,119)	-	-	(13,366,216)
Accumulated impairment	(36,952)	(39,059)	(16,380)	(209,724)	(147)	(11,927)	(2,782)	(5,723)	(75)	(90,700)	-	(413,469)

During the year ended December 31, 2020, the Group capitalized ₩46,992 million of borrowing costs (2019: ₩27,159 million) in relation to acquisition of property, plant and equipment, on property, plant and equipment. The capitalization rate of borrowings used to determine the amount of borrowing costs eligible for capitalization is 1.39% (2019: 1.98%).

Line items including depreciation in the consolidated statements of profit or loss for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Cost of sales	1,900,043	1,505,317
Selling and administrative expenses	191,174	152,488
Others	2,250	4,634
Discontinued operations	37,608	60,565
Total	2,131,075	1,723,004

Lease

(i) Amounts recognized in the consolidated statement of financial position

The consolidated statement of financial position shows the following amounts relating to leases:

(in millions of Korean won)	**2020**	**2019**
Right-of-use assets[1]		
Real-estate	183,136	272,958
Machinery	26,541	23,041
Vehicles	17,026	22,425
Tools	3,535	162
Equipment	616	1,034
	230,854	319,620

[1] Included in the line item 'Property, plant and equipment' in the consolidated statements of financial position.

Additions to the right-of-use assets during the year ended December 31, 2020, were ₩109,307 million(2019: ₩175,599 million).

(in millions of Korean won)	**2020**	**2019**
Lease liabilities[1]		
Current	55,389	55,108
Non-current	129,236	222,137
	184,625	277,245

[1] Included in the line item 'borrowings' in the consolidated statements of financial position.

(ii) Amounts recognized in the consolidated statement of profit or loss

The consolidated statement of profit or loss shows the following amounts relating to leases:

(in millions of Korean won)	**2020**	**2019**
Depreciation of right-of-use assets		
Real-estate	50,449	19,390
Machinery	5,051	5,142
Vehicles	13,578	10,039
Tools	962	28
Equipment	494	758
	70,534	35,357
Interest expense relating to lease liabilities (included in finance cost)	9,578	3,593
Expense relating to short-term leases (included in cost of goods sold and administrative expenses)	30,164	60,001

Expense relating to leases of low-value assets that are not short-term leases (included in cost of goods sold and administrative expenses)	14,304	10,614
Expense relating to variable lease payments not included in lease liabilities (included in cost of goods sold and administrative expenses)	-	22

The total cash outflow for leases during the year ended December 31, 2020, was ₩97,774 million (2019: ₩87,125 million).

The Group reviews annually whether there is any indication that an asset may be impaired. In 2020, the Group has performed impairment test for LG Polymers India Pvt. Ltd. CGU as the future economic performance was expected not to reach the planned target and recognized ₩16,177 million of impairment losses.

The amount of impairment loss recognized as other non-operating (income) expense for the year ended December 31, 2020, is as follows:

(in millions of Korean won)	2020
	LG Polymers India Pvt. Ltd.[1]
Impaired amount	
Property, plant and equipment	16,177

[1] Total carrying amount of property, plant and equipment excluding land was recognized as impairment loss because assets at the site are prohibited from moving or disposal due to the decision made by India's court.

12. Intangible Assets

Changes in intangible assets for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020						
	Development costs	**Software**	**Industrial property rights**	**Goodwill**	**Memberships**	**Others**	**Total**
Beginning balance	56,832	267,377	569,129	1,010,534	47,329	255,028	2,206,229
Separate acquisitions/ transfer	-	302,054	123,062	-	867	9,336	435,319
Additions – internal development	4,282	-	-	-	-	-	4,282
Disposals/transfer	-	(1,976)	(4,098)	-	(16,611)	(7,900)	(30,585)
Exchange differences	-	4,885	(864)	(11,711)	4	(32)	(7,718)
Amortization	(5,257)	(102,989)	(50,710)	-	-	(22,017)	(180,973)
Impairment	-	(26)	(26,735)	(111,786)	-	-	(138,547)
Transfer to assets held for sale (Note 34)	-	(2,967)	(5,123)	-	-	-	(8,090)
Ending balance	55,857	466,358	604,661	887,037	31,589	234,415	2,279,917

(in millions of Korean won)	2019						
	Development costs	**Software**	**Industrial property rights**	**Goodwill**	**Memberships**	**Others**	**Total**
Beginning balance	81,610	191,324	405,282	1,017,855	50,885	259,282	2,006,238
Separate acquisitions/ transfer[1]	5,261	151,205	215,545	-	66	41,751	413,828
Additions – internal development	17,170	-	-	-	-	-	17,170
Disposals/transfer	(7,591)	(12,915)	(4,456)	-	(3,635)	(10,305)	(38,902)
Exchange differences	(570)	1,023	60	4,294	13	1,695	6,515
Amortization	(6,729)	(63,423)	(43,713)	-	-	(23,005)	(136,870)
Impairment	(32,318)	163	(3,589)	(11,615)	-	(14,391)	(61,750)
Ending balance	56,833	267,377	569,129	1,010,534	47,329	255,027	2,206,229

[1] Intangible assets acquired from Dupont related to S-OLED are included.

Line items including amortization of intangible assets for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Cost of sales	45,972	29,886
Selling and administrative expenses	134,377	106,001
Discontinued operations	624	983
Total	180,973	136,870

The Group recognized total research and development costs of ₩1,116,080 million (2019: ₩1,095,510 million) as expenses.

Changes in greenhouse gas emission permits for the years ended December 31, 2020 and 2019, are as follows:

(in thousands of tons and millions of Korean won)	2020			
	2019		**2020**	
	Quantity	**Amount**	**Quantity**	**Amount**
Beginning balance	7,656	4,375	7,546	-
Allocation with nil consideration	898	-	2	-
Purchase/Sale	138	3,525	-	-
Borrowings/Carry forwards between years	41	-	(41)	-
Surrendered to the government	(8,733)	(7,900)	-	-
Ending balance	-	-	7,507	-

(in thousands of tons and millions of Korean won)	2018		2019		2020	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance	7,903	7,359	7,546	-	-	-
Allocation with nil consideration	245	-	-	-	7,546	-
Purchase/Sale	100	2,790	130	4,375	-	-
Borrowings/Carry forwards between years	20	-	(20)	-	-	-
Surrendered to the government	(8,268)	(10,149)	-	-	-	-
Ending balance	-	-	7,656	4,375	7,546	-

Goodwill is allocated to the Group's CGUs identified for each operating segment. The carrying amounts of goodwill allocated to CGUs as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020						
	Acquisition of NanoH2O Co., Ltd.	Acquisition of FarmHannong Co., Ltd.	Acquisition of LG Life Sciences, Ltd.	Acquisition of Uniseal, Inc.	Acquisition of Ugimag Korea Co., Ltd.	Ohers	Total
Petrochemicals							
NCC	-	-	-	-	-	2,639	2,639
ABS	-	-	-	-	-	15,209	15,209
PO	-	-	-	-	-	1,054	1,054
PVC	-	-	-	-	-	808	808
Acrylic	-	-	-	-	-	25,572	25,572
Plasticizer	-	-	-	-	-	53	53
BPA	-	-	-	-	-	467	467
Others[1]	-	-	-	-	-	1,350	1,350
Advanced Materials							
RO[1]	102,286	-	-	-	-	-	102,286
PSAA	-	-	-	-	-	4,112	4,112
Life Sciences							
Life sciences	-	-	686,229	-	-	-	686,229
Common and others							
FarmHannong Co.,Ltd.[2]	-	3,091	-	-	-	-	3,091
Adhesive[1,3]	-	-	-	44,167	-	-	44,167
Total	102,286	3,091	686,229	44,167	-	51,264	887,037

[1] Included changes resulting from foreign currency translation.
[2] Goodwill from the acquisition of FarmHannong Co., Ltd. has been impaired and recognized as impairment losses of ₩83,765 million in 2020.
[3] Goodwill from the acquisition of Uniseal, Inc. has been impaired and recognized as impairment losses of ₩28,020 million in 2020.

(in millions of Korean won)	2019						
	Acquisition of NanoH2O Co., Ltd.	**Acquisition of FarmHannong Co., Ltd.**	**Acquisition of LG Life Sciences, Ltd.**	**Acquisition of Uniseal, Inc.**	**Acquisition of Ugimag Korea Co., Ltd.**	**Ohers**	**Total**
Petrochemicals							
NCC	-	-	-	-	-	2,639	2,639
ABS	-	-	-	-	-	15,726	15,726
PO	-	-	-	-	-	1,054	1,054
PVC	-	-	-	-	-	808	808
Acrylic	-	-	-	-	-	25,572	25,572
Plasticizer	-	-	-	-	-	53	53
BPA	-	-	-	-	-	467	467
Others[1]	-	-	-	-	-	1,350	1,350
Advanced Materials							
RO[2]	108,848	-	-	-	-	-	108,848
PSAA	-	-	-	-	-	4,112	4,112
Life Sciences							
Life sciences	-	-	686,229	-	-	-	686,229
Common and others							
FarmHannong Co.,Ltd.	-	86,858	-	-	-	-	86,858
Adhesive[2]	-	-	-	76,818	-	-	76,818
Total	108,848	86,858	686,229	76,818	-	51,780	1,010,534

[1] Goodwill from the acquisition of Ugimag Korea Co., Ltd. has been fully impaired and recognized as impairment losses in 2019.
[2] Included changes resulting from foreign currency translation.

The recoverable amounts of CGUs have been determined based on value-in-use or fair value less cost of disposal calculations. Value-in-use calculations use pre-tax cash flow projections based on financial budgets approved by management covering a five-year period. Fair value less cost of disposal reflects expectation of future business and usage pattern of assets from the perspective of market participants. Management determined the estimated pre-tax cash flow based on past performance and its expectations of market development. Discount rates applied by the management are the pre-tax discount rates reflecting specific risks relating to the relevant operating segments. Taking into account the uncertainties relating to COVID-19, discount rates have been determined based on average values of input parameters (e.g. market risk premium) for longer observable period than before.

During 2020, key assumptions used for calculation of value in use and fair value less cost of disposal are as follows:

(in millions of Korean won)	2020	
	Pre-tax discount rate	**Growth rate for subsequent years after five years**
Acquisition of LG Petrochemical Co., Ltd.	7.8%	0.0%
Acquisition of SAP business	7.7%	0.0%
Acquisition of NanoH2O, Inc	8.4%	1.0%
Acquisition of FarmHannong	11.6%	1.0%
Acquisition of PSAA business	7.8%	0.0%
Acquisition of LG Life Sciences	11.3%	3.0%
Acquisition of Uniseal,Inc.	12.8%	2.0%
Consolidation of LG Chem(HUIZHOU) Petrochemical Co., Ltd	8.6%	0.0%

The results of the sensitivity analysis for the fair value less cost of disposal calculation of Life Sciences CGU are as follows:

(in millions of Korean won)	**0.5% Increase**	**0.5% Decrease**
Discount rate		
Increase(decrease) in fair value	(138,675)	162,305
Growth rate		
Increase(decrease) in fair value	113,949	(97,435)

Had the discount rate been 0.5% higher than the management's estimate, the Group should have recognized impairment loss of ₩78,810 million for the carrying value of goodwill. Also, had the growth rate been 0.5% lower than the management's estimate, the Group should have recognized impairment loss of ₩37,750 million for the carrying value of goodwill.

Impairment test on intangible assets other than goodwill

The impairment losses for intangible assets other than goodwill that the Group recognized during the year are as follows:

(in millions of Korean won)	2020			
	Development costs	**Industrial property rights**	**Other intangible assets**	**Total**
FarmHannong[1]	-	-	25,283	25,283
	-	-	25,283	25,283

[1] During 2020, the Group has performed impairment test for FarmHannong and recognized ₩25,283 million of impairment losses.

13. Other Current and Non-Current Assets

Details of other current and non-current assets as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Current		
Prepayments to suppliers and prepaid expenses	174,885	106,380
Prepaid value added tax	428,303	545,668
Others	39,964	141,748
Total	643,152	793,796
Non-current		
Long-term prepayments and long-term prepaid expenses	87,247	144,336
Others	98	96
Total	87,345	144,432

14. Borrowings

Borrowings as at December 31, 2020 and 2019, consist of:

(in millions of Korean won)	**2020**	**2019**
Current		
Short-term borrowings	879,757	771,102
Current portion of long-term borrowings of bank loans	341,203	309,944
Current-portion of debentures	272,466	219,943
Finance lease liabilities	55,389	55,108
	1,548,815	1,356,097
Non-current		
Long-term borrowings	3,131,254	1,536,821
Debentures	5,376,812	5,299,213
Lease liabilities	129,236	222,137
	8,637,302	7,058,171
Total	10,186,117	8,414,268

Details of short-term borrowings as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**Bank**	**Latest maturity date**	**Interest rate(%) as at December 31, 2020**	**2020**	**2019**
Bank loans	CITI and others	December 9, 2021	2.60 and others	879,757	771,102
Total				879,757	771,102

Details of long-term borrowings as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020				
	Bank	**Annual interest rate (%)**	**Amount in Korean won**	**Current**	**Non-current**
Borrowings in Korean won	KDB[1]	(1Y) + 1.45 ~ 1.99	6,622	1,597	5,025
	Kookmin Bank	24M MOR + 1.89	2,000	980	1,020
Borrowings in foreign currencies	HSBC	USD: 3M LIBOR + 0.95~1.40 CNY: PBOC ×0.95, LPR(5Y)-0.3375	87,806	60,541	27,265
	SMBC	3M LIBOR + 0.32~0.48	202,142	-	202,142
	Construction Bank of China	LPR(1Y)+0.36~0.46	81,673	35,315	46,358
	Communications Bank of China	PBOC ×1.00	5,676	5,676	-
	CITI	USD: 3M LIBOR + 0.95 EUR: EURIBOR +0.62~0.70	241,354	39,212	202,142
	ING	6M EURIBOR + 0.70 ~0.83	161,714	-	161,714
	Standard Chartered Bank	USD: 3M LIBOR + 1.20 CNY: PBOC ×0.95	92,036	79,514	12,522
	CNOOC Finance	PBOC ×0.90	10,018	10,018	-
	EBRD	6M EURIBOR+0.62	336,903	-	336,903
	Bank of China	3M LIBOR +1.15	5,475	5,475	-
	MUFG	EUR:3M EURIBOR + 0.60~0.80	134,761	-	134,761
	Industrial and Commercial Bank of China	PBOC ×1.00	46,024	10,473	35,551
	CIMB	3M LIBOR + 1.50	49,021	49,021	-
	KEB Hana Bank	3M EURIBOR + 0.62	269,523	-	269,523
	KDB	USD: 3M LIBOR+ 0.93 EUR: 6M EURIBOR+1.50	513,380	43,381	469,999
	The Export-Import Bank of Korea	6M EURIBOR + 1.50	296,475	-	296,475
	NongHyup Bank	6M EURIBOR + 1.50	148,238	-	148,238
	EIB	3M EURIBOR + 0.47	646,855	-	646,855
	DBS	6M EURIBOR + 0.60	134,761	-	134,761
Total			3,472,457	341,203	3,131,254

[1] Manufacturing facilities are pledged as collateral for the above long-term borrowings (Note 18).

(in millions of Korean won)	2019				
	Bank	**Annual interest rate (%)**	**Amount in Korean won**	**Current**	**Non-current**
Borrowings in Korean won	KDB[1]	(1Y)+1.45~1.99	7,607	986	6,621
	Kookmin Bank	24M MOR+1.89	1,188	-	1,188
Borrowings in foreign currencies	HSBC	USD: 3M LIBOR +0.95~1.40 CNY: PBOC ×0.95	87,958	14,974	72,984
	SMBC	3M LIBOR + 0.65~1.05	71,822	9,171	62,651
	Agricultural Bank of China	USD: 3M LIBOR + 0.80 CNY: PBOC ×0.90	33,594	10,059	23,535
	Construction Bank of China	PBOC ×0.90	37,146	7,146	30,000
	Communications Bank of China	PBOC ×1.00	38,576	5,800	32,776
	CITI	USD: 3M LIBOR + 0.95 EUR: EURIBOR + 0.65	279,935	43,574	236,361
	Bank of America	3M LIBOR + 0.90	17,367	-	17,367
	ING	6M EURIBOR + 0.70~0.83	155,795	-	155,795
	UOB	6M LIBOR + 1.20	111,664	111,664	-
	Standard Chartered Bank	USD: 3M LIBOR + 1.20 CNY: PBOC ×0.95	107,534	12,431	95,103
	Mizuho Banking Corporation	3M LIBOR + 0.98	31,180	6,929	24,251
	CNOOC Finance	PBOC ×0.90	33,148	23,204	9,944
	EBRD	6M EURIBOR + 0.62	129,829	-	129,829
	Hangseng	3M LIBOR + 1.00	29,483	29,483	-
	Bank of China	3M LIBOR + 0.95	18,298	12,487	5,811
	MUFG	USD: 3LIBOR + 1.00 EUR:3M EURIBOR + 0.60~0.80	173,165	5,778	167,387
	Industrial and Commercial Bank of China	PBOC ×1.00	43,579	5,801	37,778
	CIMB	3LIBOR + 1.50	57,809	5,781	52,028
	KEB Hana Bank	3M EURIBOR + 0.62	259,658	-	259,658
	KDB	3M LIBOR + 0.93	30,182	3,018	27,164
	Deutsche Bank	PBOC×0.84	90,248	1,658	88,590
Total			1,846,765	309,944	1,536,821

[1] Manufacturing facilities are pledged as collateral for the above long-term borrowings (Note 18).

Details of debentures as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020					
	Financial institution	**Annual interest rate (%)**	**Latest maturity date**	**Amount in Korean won**	**Current**	**Non-current**
50-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.28	2022.5.19	400,000	-	400,000
50-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.53	2024.5.19	280,000	-	280,000
51-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.56	2021.2.20	190,000	190,000	-
51-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.88	2023.2.20	240,000	-	240,000
51-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.07	2025.2.20	270,000	-	270,000
51-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.29	2028.2.20	300,000	-	300,000
52-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.02	2022.3.13	160,000	-	160,000
52-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.11	2024.3.13	240,000	-	240,000
52-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.21	2026.3.13	200,000	-	200,000
52-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.40	2029.3.13	400,000	-	400,000
53-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.57	2023.2.19	350,000	-	350,000
53-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.65	2025.2.19	250,000	-	250,000
53-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.72	2027.2.19	50,000	-	50,000
53-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.91	2030.2.19	250,000	-	250,000
USD foreign currency debenture with maturity in 2024	CITI and others	3.25	2024.10.15	544,000	-	544,000
USD foreign currency debenture with maturity in 2029	CITI and others	3.63	2029.4.15	544,000	-	544,000
EUR foreign currency debenture with maturity in 2023	CITI and others	0.50	2023.4.15	669,120	-	669,120
1-1st USD Overseas Exchangeable bonds[1,3]	Credit Suisse	-	2020.10.7	-	-	-
1-2nd EUR Overseas Exchangeable bonds[2,3]	Credit Suisse	-	2020.1.14	32,787	32,787	-
Debentures in Korean won (non-guaranteed)	NH Investment & Securities Co., Ltd.	2.26	2022.02.16	100,000	-	100,000
	NH Investment & Securities Co., Ltd.	2.71	2021.03.02	50,000	50,000	-
	NH Investment & Securities Co., Ltd.	3.00	2023.03.02	40,000	-	40,000
	NH Investment & Securities Co., Ltd.	1.95	2023.02.14	80,000	-	80,000
	NH Investment & Securities Co., Ltd.	2.22	2025.02.14	30,000	-	30,000
Less: discount on debentures				(20,629)	(321)	(20,308)
Total				5,649,278	272,466	5,376,812

(in millions of Korean won)

	2019					
	Financial institution	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
50-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.95	2020.5.19	120,000	120,000	-
50-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.28	2022.5.19	400,000	-	400,000
50-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.53	2024.5.19	280,000	-	280,000
51-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.56	2021.2.20	190,000	-	190,000
51-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.88	2023.2.20	240,000	-	240,000
51-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.07	2025.2.20	270,000	-	270,000
51-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.29	2028.2.20	300,000	-	300,000
52-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.02	2022.3.13	160,000	-	160,000
52-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.11	2024.3.13	240,000	-	240,000
52-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.21	2026.3.13	200,000	-	200,000
52-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.40	2029.3.13	400,000	-	400,000
1-1st USD Overseas Exchangeable bonds[1]	Credit Suisse	-	2021.4.16	254,716	-	254,716
1-2nd EUR Overseas Exchangeable bonds[2]	Credit Suisse	-	2021.4.16	408,950	-	408,950
USD foreign currency debenture with maturity in 2024	CITI and others	3.25	2024.10.15	578,900	-	578,900
USD foreign currency debenture with maturity in 2029	CITI and others	3.63	2029.4.15	578,900	-	578,900
EUR foreign currency debenture with maturity in 2023	CITI and others	0.50	2023.4.15	648,715	-	648,715
Debentures in Korean won (non-guaranteed)	NH Investment & Securities Co., Ltd.	1.93	2020.2.16	100,000	100,000	-
	NH Investment & Securities Co., Ltd.	2.26	2022.2.16	100,000	-	100,000
	NH Investment & Securities Co., Ltd.	2.71	2021.3.02	50,000	-	50,000
	NH Investment & Securities Co., Ltd.	3.00	2023.3.02	40,000	-	40,000
Less: discount on debentures				(41,025)	(57)	(40,968)
Total				5,519,156	219,943	5,299,213

[1] Details of 1-1st USD overseas exchangeable bonds are as follows:

	Details
Aggregate principal amount	USD 220,000,000
Issue price	USD 220,000,000
Coupon rate (%)	0.00
Issue date	April 16, 2018
Maturity date	April 16, 2021
Redemption	- Redemption at maturity: Outstanding bond principal, which is not repaid early or which call option is not exercised on, is repaid at maturity as a lump sum. - Prepayment: The issuer has a call option.
Underlying shares	509,606 registered ordinary shares (treasury shares)
Exchange price (Korean won/shares)	460,000
Exchange period	From May 27, 2018 to April 6, 2021
Call option by the issuer	- Share price (based on closing price) is higher than 130% of exchange price for more than 20 trading days during 30 consecutive trading days in a row, after 1 year from the closing date. - The amount of outstanding bonds is less than 10% in aggregate principal amount of the bonds originally issued (clean up call). - As a result of changes relating to tax laws in Korea, the issuer becomes obliged to pay any additional amounts.
Call option by bondholders	- The shares cease to be listed or admitted to trading or are suspended for a period equal to or exceeding 30 consecutive trading days. - The occurrence of a change of control

[2] Details of 1-2nd EUR overseas exchangeable bonds are as follows:

	Details
Aggregate principal amount	EUR 315,200,000
Issue price	EUR 315,200,000
Coupon rate (%)	0.00
Issue date	April 16, 2018
Maturity date	April 16, 2021
Redemption	- Redemption at maturity: Outstanding bond principal, which is not repaid early or which call option is not exercised on, is repaid at maturity as a lump sum. - Prepayment: The issuer has a call option.
Underlying shares	775,128 registered ordinary shares (treasury shares)
Exchange price (Korean won/shares)	533,600
Exchange period	From May 27, 2018 to April 6, 2021
Call option by the issuer	- Share price (based on closing price) is higher than 130% of exchange price for more than 20 trading days during 30 consecutive trading days in a row, after 1 year from the closing date. - The amount of outstanding bonds is less than 10% in aggregate principal amount of the bonds originally issued (clean up call). - As a result of changes relating to tax laws in Korea, the issuer becomes obliged to pay any additional amounts.
Call option by bondholders	- The shares cease to be listed or admitted to trading or are suspended for a period equal to or exceeding 30 consecutive trading days. - The occurrence of a change of control

[3] As the conditions for the execution of call options have been satisfied for the year ended December 31, 2020, exchangeable bonds of USD 219,800,000 were exchanged with 509,113 treasury shares and the remaining exchangeable bonds of USD 200,000 have been early repaid on October 7, 2020. Also, exchangeable bonds of EUR 290,700,000 were exchanged with 714,856 treasury shares. In January 2021, exchangeable bonds of EUR 22,300,000 were additionally exchanged with 54,834 treasury shares and the remaining exchangeable bonds of EUR 2,200,000 have been early repaid on January 14, 2021.

Details of lease liabilities as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020				
Leaser	**Annual interest rate (%)**	**Latest maturity date**	**Total amount**	**Current**	**Non-current**
Hyundai Oil Bank and others	1.98 ~ 3.01	2068.12.31	184,625	55,389	129,236

(in millions of Korean won)	2019				
Leaser	**Annual interest rate (%)**	**Latest maturity date**	**Total amount**	**Current**	**Non-current**
Hyundai Oil Bank and others	1.98 ~ 4.13	2068.12.31	277,245	55,108	222,137

15. Provisions

Changes in provisions for other liabilities and charges for the years ended December 31, 2020 and 2019, as follows:

(in millions of Korean won)	2020				
	Warranty[1]	**Greenhouse gas emission[2]**	**Legal claims[3]**	**Restoration[4]**	**Total**
Beginning balance	596,251	25,157	370	114,950	736,728
Additions (reversal)	942,425	(12,382)	8,885	22,112	961,040
Used	(294,659)	(7,900)	(969)	(24,233)	(327,761)
Ending balance	1,244,017	4,875	8,286	112,829	1,370,007
Less: current portion	(1,000,312)	(4,875)	-	(36,264)	(1,041,451)
Total	243,705	-	8,286	76,565	328,556

(in millions of Korean won)	2019				
	Warranty[1]	**Greenhouse gas emission[2]**	**Legal claims[3]**	**Restoration[4]**	**Total**
Beginning balance	198,575	11,700	402	126,976	337,653
Additions	652,528	23,606	13	8,884	685,031
Used	(254,852)	(10,149)	(45)	(20,910)	(285,956)
Ending balance	596,251	25,157	370	114,950	736,728
Less: current portion	(417,561)	(25,157)	-	(29,411)	(472,129)
Total	178,690	-	370	85,539	264,599

[1] Warranty provisions have been accrued based on historical experience for the estimated warranty costs to be incurred due to quality control, exchange, refunds with regard to products. In addition, provisions related to replacement costs for ESS and voluntary automotive battery recalls are

included.

[2] Greenhouse gas emission provisions have been accrued for estimated expenditures to be obligated for any excess emission. The estimated emission as at December 31, 2020 amounts to 8,437 thousand tons (2019: 8,255 thousand tons).

[3] Lawsuit provisions have been accrued for certain pending cases.

[4] As at December 31, 2020, restoration provisions have been accrued for the estimated expenses to restore land pollutions and others.

16. Net Defined Benefit Liabilities

Details of net defined benefit liabilities recognized in the consolidated statements of financial position as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Present value of defined benefit obligations[1]	1,454,596	1,343,553
Fair value of plan assets	(1,336,637)	(1,164,393)
Liabilities in the consolidated statement of financial position	117,959	179,160

[1] The present value of retirement benefit obligations is net of existing contributions to the National Pension Plan of ₩734 million as at December 31, 2020 (2019: ₩768 million).

The amounts recognized in the consolidated statements of profit or loss for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Current service cost[1]	196,654	161,211
Past service cost	-	-
Interest cost	4,006	6,063
Total, included in employee benefit expenses	200,660	167,274

[1] The above amounts excluded ₩5,622 million (2019: ₩1,720 million) of expenses capitalized to construction in progress and development costs.

Post-employment benefits recognized for defined contribution plan for the year ended December 31, 2020, amounted to ₩8,109 million (2019: ₩6,969 million).

Post-employment benefits recognized in the consolidated statements of profit or loss for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Cost of sales	131,628	109,856
Selling and administrative expenses	74,919	57,667
Discontinued operations	2,222	6,720
Total	208,769	174,243

Movements in the present value of defined benefit obligations for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Beginning balance	1,343,553	1,167,524
Transfer in	7,190	20,820
Transfer out	(1,690)	(5,909)
Current service cost	202,276	162,931
Interest expense	31,314	30,649
Remeasurements:		
Actuarial loss from change in demographic assumptions	7,943	5,316
Actuarial loss (gain) from change in financial assumptions	(28,735)	74,372
Actuarial gain from experience adjustments	(10,239)	(21,594)
Others	1,433	916
Exchange differences	(14,637)	(949)
Payments from plans	(83,812)	(90,523)
Ending balance	1,454,596	1,343,553

Movements in the fair value of plan assets for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Beginning balance	1,164,393	939,980
Transfer out	(725)	(184)
Interest income	27,307	24,586
Remeasurements:		
Return on plan assets (excluding amounts included in interest income)	(5,069)	(6,796)
Contributions:		
Employers	227,555	283,196
Payments from plans	(76,458)	(75,299)
Administrative costs	(366)	(1,090)
Ending balance	1,336,637	1,164,393

The actual return on plan assets for the year ended December 31, 2020, was ₩22,238 million (2019: ₩17,790million).

The significant actuarial assumptions as at December 31, 2020 and 2019, are as follows:

	2020	**2019**
Discount rate	2.4% ~ 2.5%	2.4% ~ 2.5%
Salary growth rate	4.0% ~ 5.0%	4.0% ~ 5.0%

The sensitivity analysis for changes in key actuarial assumptions as at December 31, 2020, is as follows:

(in millions of Korean won)	**Increase by 0.5%**	**Decrease by 0.5%**
Discount rate:		
Increase (decrease) in defined benefit obligations	(84,399)	92,803
Salary growth rate:		
Increase (decrease) in defined benefit obligations	90,078	(82,894)

A decrease in corporate bond yields may lead most significantly to an increase in defined benefit liabilities.

The above sensitivity analyses are based on a change in an assumption while holding all other assumptions constant. In practice, this is unlikely to occur, and changes in some of the assumptions may be correlated. The sensitivity of the defined benefit obligation to changes in principal actuarial assumptions is calculated using the projected unit credit method, the same method applied when calculating the defined benefit obligations recognized on the statement of financial position.

The methods and types of assumptions used in preparing the sensitivity analysis did not change compared to the prior period.

Plan assets as at December 31, 2020 and 2019, consist of:

(in millions of Korean won)	**2020**		**2019**	
	Amount	**Composition (%)**	**Amount**	**Composition (%)**
Insurance contracts with guaranteed yield	1,314,072	98.3	1,138,725	97.8
Equity linked bonds	20,855	1.6	24,891	2.1
Time deposits	1,710	0.1	777	0.1
	1,336,637	100.0	1,164,393	100.0

Plan assets consist of various debt instruments with principal and interest protection and others which have no quoted market prices in an active market.

The weighted average duration of the defined benefit obligation is 12.87 years.

The Group reviews the funding level on an annual basis and has a policy of eliminating deficit from the fund. Expected contributions to post-employment benefit plans for the year ending December 31, 2021, are ₩340,682 million.

17. Other Current and Non-Current Liabilities

Details of other current and non-current liabilities as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020	2019
Current		
Advances from customers	203,507	150,673
Withholdings	128,754	108,140
Unearned revenues	62,286	48,907
Accrued expenses	393,482	198,206
Total	788,029	505,926
Non-current		
Long-term accrued expenses	63,019	59,514
Long-term unearned revenues	14,952	15,272
Long-term advanced received	68,935	58,699
Total	146,906	133,485

18. Commitments and Contingencies

(1) The Parent Company is jointly liable for liabilities of LG Energy Solutions Co., Ltd. as at December 1, 2020, a newly established company through the split-off from the Parent Company.

(2) As at December 31, 2020, the Parent Company and certain subsidiaries have been guaranteed from Seoul Guarantee Insurance Company for the execution of contracts and others.

(3) As at December 31, 2020, the Parent Company and certain subsidiaries have various line of credit agreements with several financial institutions, as follows:

(*unit: Korean won in millions, foreign currencies in millions*)

Classification	The Parent Company		Certain Overseas Subsidiaries					
	KRW	USD	KRW	USD	CNY	EUR	INR	THB
Limit of bank overdraft	20,400	-	8,700	300	1,800	29	-	10
Limit of the letter of credit	22,000	356	-	305	4,934	-	777	-
Limit of discount of notes from export	-	397	-	135	-	-	-	-
Limit of guaranteed payments in other foreign currency	-	41	-	56	-	-	-	-
Limit of loan arrangements	-	-	83,122	2,690	3,784	2,475	3,017	-

The Parent Company also entered into comprehensive credit line agreements with other financial institutions relating to trade finance and import/export amounting to ₩20,000 million (including bank overdraft of ₩5,000 million) and USD 55 million.

(4) As at December 31, 2020, the Parent Company and certain subsidiaries have B2B purchase arrangements with several financial institutions with limit of ₩330,000 million and ₩167,818 million, respectively, as well as enterprise general fund arrangement with limit of ₩350,000 million and other loans with limit of USD 55 million.

(5) As at December 31, 2020, the Parent Company has reverse factoring agreements, and utilized the facility for ₩739,616 million provided by Shinhan Card and utilized the facility for ₩1,360,320 million provided by Woori Card.

(6) As at December 31, 2020, in connection with styrene monomer gas leakage accident, several law suits against LG Polymer India Pvt. Ltd., a subsidiary, have been filed with National Green Tribunal of India (NGT) and Andhra Pradesh High Court (APHC). The ultimate outcome of these cases cannot be determined at the reporting date. NGT has ordered LG Polymer India Pvt. Ltd. to deposit INR 500 million in connection with this accident and the manufacturing facility is currently closed with limited access in accordance with APHC's order.

(7) As at December 31, 2020, in relation to price fixing of mobile batteries, the consumers in Israel have filed two class actions against the Parent Company and certain overseas subsidiaries. However, the ultimate outcome of these cases cannot be determined at the reporting date.

(8) In addition, as at December 31, 2020, the Parent Company and certain subsidiaries have been involved as a plaintiff in 9 legal actions claiming for ₩20,711 million and 22 legal actions claiming for ₩8,790 million, respectively. They have been involved as a defendant in 7 legal actions claiming for ₩4,612 million and 183 legal actions claiming for ₩7,806 million, respectively. The ultimate outcome of these cases cannot be determined at the reporting date.

(9) As at December 31, 2020, the Parent Company is under investigation by the related authorities in relation to the manipulation of the emission of fine dust-causing substance in the Yeosu Industrial Complex, and the final outcome of these investigations cannot be determined at the reporting date. As at December 31, 2020, the Parent Company shut down the relevant production facilities.

(10) The Parent Company has entered into manufacture and production technical contracts with ExxonMobil and others.

(11) The Parent Company has entered into a license agreement with LG Corp. to use trademarks on the products that the Group manufactures and sells, and on the services the Group provides in relation to its business.

(12) As at December 31, 2020, the Parent Company has entered into payment guarantee contract of USD 8 million, and certain subsidiaries have entered into payment guarantee contracts of USD 2 million, EUR 3 million and ₩5,373 million with financial institutions in relation to the quality assurance of certain installed products. Also, certain subsidiaries have entered into payment guarantee contract of CNY 67 million with financial institutions in relation to the customs clearance of imported raw materials.

(13) As at December 31, 2020 and 2019, assets pledged as collateral for the borrowings are as follows:

(in millions of Korean won)	2020			
	Secured amount	**Borrowings / Loan**	**Limit**	**Secured party**
Factory	20,880	Current and non-current borrowings	6,622	KDB
	20,880		6,622	

(in millions of Korean won)	2019			
	Secured amount	**Borrowings / Loan**	**Limit**	**Secured party**
Factory	20,880	Non-current borrowings	16,208	KDB
	20,880		16,208	

(14) Capital expenditure arrangement that has not been executed at the end of the reporting period is as follows:

(in millions of Korean won)	**2020**	**2019**
Property, plant and equipment	2,428,411	2,069,630

(15) After the reporting period, General Motors (GM) has issued a recall for the Chevrolet Bolt EV to investigate fire risk. Investigation on the cause of the fire is being conducted by related authorities and the exact cause of fire has not been determined yet. As such, the Group cannot make reasonable expectation of the timing and amount of an outflow from the Group of resources due to the uncertainty of the cause of the accident.

(16) As of December 31, 2020, the Group has entered into an agreement with General Motors (GM) regarding joint investment in Ultium Cells LLC, whereby each party can sell its shares to third parties in 8 years after the inception of the contract. In addition, if one party defaults, the other party has the right to purchase shares from the other party. The Group is in the process of obtaining approval from the government for the use of core technologies according to the Industrial Technology Protection Act.

19. Share Capital

Changes in share capital and share premium for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won and in shares)	**Ordinary shares**		**Preferred shares**		
	Number of shares	**Share capital**	**Number of shares**	**Share capital**	**Share premium**
January 1, 2019	70,592,343	352,962	7,688,800	38,444	2,014,038
December 31, 2019	70,592,343	352,962	7,688,800	38,444	2,014,036
December 31, 2020	70,592,343	352,962	7,688,800	38,444	2,014,036

Changes in treasury shares for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won and in shares)	Number of shares		Carrying amount	Gain on disposal of treasury shares
	Ordinary shares	Preferred shares		
January 1, 2019	1,652,417	16,367	354,945	13,855
December 31, 2019	1,652,417	16,367	354,945	13,855
Treasury shares reduction due to the exercise of exchange rights	(1,187,575)	-	(319,246)	417,865
Others	-	1	-	-
December 31, 2020	464,842	16,368	35,699	431,720

20. Retained Earnings

Retained earnings as at December 31, 2020 and 2019, consist of:

(in millions of Korean won)	2020	2019
Legal reserve[1]	401,574	352,286
Discretionary reserve[2]	13,780,609	13,608,917
Retained earnings before appropriation	993,121	837,487
Total	15,175,304	14,798,690

[1] The Commercial Code of the Republic of Korea requires the Parent Company to appropriate for each financial period, as a legal reserve, an amount equal to a minimum of 10% of cash dividends paid until such reserve equals 50% of its issued share capital. The reserve is not available for cash dividends payment, but may be transferred to share capital or used to reduce accumulated deficit. When the accumulated legal reserves (the sum of capital reserves and earned profit reserves) are greater than 1.5 times the paid-in capital amount, the excess legal reserves may be distributed in accordance with a resolution of the shareholders' meeting.

[2] The Group separately accumulates a discretionary reserve for research and human resource development through appropriation of retained earnings, which has been included as deductible expense for the corporate income tax return according to the Special Tax Treatment Law. The reserve could be reversed in accordance with the terms of related tax laws.

21. Other Components of Equity

Details of other components of equity as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020	2019
Treasury shares (Note 19)	(35,699)	(354,945)
Capital transactions within the Group[1]	(19,299)	(19,298)
Total	(54,998)	(374,243)

[1] Includes gain or loss on disposal of investments and investment differences due to changes in equity, net of deferred tax.

22. Selling and Administrative Expenses

Selling and administrative expenses for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Wages and salaries	943,299	857,421
Post-employment benefits (Note 16)	74,919	57,667
Employee benefits	196,317	188,157
Travel expense	34,516	79,182
Water & utilities	56,135	54,883
Packaging expense	7,134	10,582
Rental expenses	87,943	94,576
Commission expenses	690,734	555,141
Depreciation	192,322	153,714
Advertising expense	27,413	38,194
Freight expenses	598,380	568,341
Training expense	16,012	24,969
Amortization (Note 12)	134,377	106,001
Sample expense	21,473	22,762
Development costs	217,778	236,308
Others	1,215,313	812,331
Total	4,514,065	3,860,229

23. Breakdown of Expenses by Nature

Cost of sales, and selling and administrative expenses by nature for the years ended December 31, 2020 and 2019, consist of:

(in millions of Korean won)	**2020**	**2019**
Changes in inventories of merchandise, finished goods, semi-finished goods and work in process	(360,005)	(349,012)
Raw materials and consumables used	16,780,471	15,614,550
Purchase of merchandise	1,258,026	1,275,701
Employee benefit expenses (Note 24)	2,900,719	2,528,142
Advertising expenses	28,463	39,422
Freight expenses	637,018	602,367
Commission expenses	1,121,736	889,023
Depreciation and amortization	2,272,727	1,794,918
Rent expenses and usage fee	59,613	77,844
Other expenses	3,579,583	4,054,708
Total	28,278,351	26,527,663

24. Employee Benefit Expenses

Details of employee benefit expenses for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Salaries	2,420,523	2,103,682
Post-employment benefits – Defined benefit plan (Note 16)	198,561	160,656
Post-employment benefits – Defined contribution plan (Note 16)	7,986	6,867
Others	273,649	256,937
Total	2,900,719	2,528,142

25. Finance Income and Costs

Details of finance income and costs for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Finance income		
Interest income[1]	35,927	48,789
Dividend income	289	1,724
Exchange differences	377,354	205,998
Gain on valuation of derivative instruments	-	29,600
Others	3,898	67
Total	417,468	286,178
Finance costs		
Interest expense[2]	198,814	203,169
Exchange differences	585,354	217,825
Loss related to derivative instruments	325,417	273
Others	-	7
Total	1,109,585	421,274

[1] Details of interest income for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Deposits held by financial institutions	24,976	37,782
Other loans and receivables	10,951	11,007
Total	35,927	48,789

[2] Details of interest expense for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Interest on financial institutions	49,505	87,671
Interest on lease liabilities	9,578	3,590
Interest on debentures	149,987	121,760
Other interest expenses	36,808	17,307
Capitalized interest for qualifying assets	(47,064)	(27,159)
Total	198,814	203,169

26. Other Non-Operating Income

Details of other non-operating income for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Exchange differences	762,423	468,651
Gain on disposal of property, plant and equipment	3,452	10,124
Gain on disposal of intangible assets	104	405
Reversal of impairment loss on property, plant and equipment	-	215
Gain on disposal of investments in associates	312,080	599
Others	77,185	39,127
Total	1,155,244	519,121

27. Other Non-Operating Expenses

Details of other non-operating expenses for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Exchange differences	925,189	455,348
Loss on disposal of property, plant and equipment	80,763	43,471
Loss on disposal of intangible assets	1,776	681
Impairment loss on property, plant and equipment	73,964	58,166
Impairment loss on intangible assets	138,484	61,032
Donations	13,627	14,588
Others	93,134	23,922
Total	1,326,937	657,208

28. Tax Expense and Deferred Tax

Details of income tax expense for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Current tax on profit for the years	119,273	243,906
Adjustments in respect of prior years	6,287	52,976
Deferred tax - movement in temporary differences	433,353	(107,550)
Deferred tax – tax credit carryforwards	(12,578)	(1,893)
	546,335	187,439
Deferred tax charged directly to equity	(186,855)	(21,243)
Current tax charged directly to equity	(6,771)	18,260
Others	15,130	(15,275)
Income tax expense	367,839	169,181

The aggregate current and deferred tax charged directly to equity (other comprehensive income) for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Current tax		
Remeasurements of net defined benefit liabilities	(6,771)	18,260
Deferred tax		
Loss on valuation of derivative instruments	(674)	(10,958)
Exchange differences on translation of foreign operations	(4,998)	(569)
Gain on disposal of financial assets at fair value through other comprehensive income	(5,262)	-
Gain on valuation of financial assets at fair value through other comprehensive income	4,430	(9,716)
Remeasurements of net defined benefit liabilities	131	-
Gain on disposal of treasury shares	(180,482)	-
Total	(186,855)	(21,243)

Movements in deferred tax assets (liabilities) for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020						
		Increase (decrease)					
	Beginning balance	Business combination	Profit (loss) for the year	Other comprehen-sive income	Others	Exchange differences	Ending balance
Net defined benefit liabilities	358,940	-	29,572	115	-	(18)	388,609
Plan assets	(317,845)	-	(48,231)	16	-	-	(366,060)
Provision for impairment on receivables	1,106	-	(693)	-	-	16	429
Property, plant and equipment	116,316	-	19,514	-	36,498	2,686	175,014
Intangible assets	(42,115)	-	574	-	-	-	(41,541)
Investments in subsidiaries, associates and joint ventures	(30,109)	-	(56,435)	-	-	-	(86,544)
Accrued income	(218)	-	(36)	-	-	(1)	(255)
Others	271,183	-	(177,198)	(181,988)	694,776	(4,281)	602,492
	357,258	-	(232,933)	(181,857)	731,274	(1,598)	672,144
Exchange differences on translation of foreign operations	2,161	-	-	(4,998)	-	-	(2,837)
Tax credit carryforwards	20,687	-	12,578	-	(16,775)	(1,240)	15,250
Tax loss carryforwards	84,688	-	(13,565)	-	(34,234)	(1,506)	35,383
Deferred tax assets (liabilities)	464,794	-	(233,920)	(186,855)	680,265	(4,344)	719,940

(in millions of Korean won)	2019					
		Increase (decrease)				
	Beginning balance	Business combination	Profit (loss) for the year	Other comprehensive income	Exchange differences	Ending balance
Net defined benefit liabilities	311,710	-	47,211	-	19	358,940
Plan assets	(256,797)	-	(61,048)	-	-	(317,845)
Provision for impairment on receivables	813	-	273	-	20	1,106
Property, plant and equipment	98,726	-	17,368	-	222	116,316
Intangible assets	(47,092)	2,851	2,126	-	-	(42,115)
Investments in subsidiaries, associates and joint ventures	(18,904)	-	(11,205)	-	-	(30,109)
Accrued income	(534)	-	320	-	(4)	(218)
Others	158,198	-	132,930	(20,674)	729	271,183
	246,120	2,851	127,975	(20,674)	986	357,258
Exchange differences on translation of foreign operations	3,500	-	(798)	(569)	28	2,161
Tax credit carryforwards	18,602	-	1,893	-	192	20,687
Tax loss carryforwards	82,034	-	1,616	-	1,038	84,688
Deferred tax assets (liabilities)	350,256	2,851	130,686	(21,243)	2,244	464,794

The reconciliations between income tax expense and accounting profit for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020	2019
Profit before income tax expense	1,106,549	560,560
Tax at domestic tax rates applicable to profits in the respective countries[1]	495,467	213,020
Tax effects of:	(127,628)	(43,839)
Income not subject to tax	(36,733)	(18,865)
Expenses not deductible for tax purposes	29,198	35,405
Unrecognized deferred income tax for temporary differences in the current year	749,185	19,594
Tax credit	(173,716)	(92,052)
Others	(695,562)	12,079
Income tax expense	367,839	169,181
Effective tax rate (income tax expense/profit before income tax)	33.24%	30.18%

[1] The weighted average applicable tax rate on profit before income tax for the year ended December 31, 2020, is 44.78% (2019: 38.00%).

Realization of deferred tax assets is dependent on the Group's ability to generate future taxable profits in excess of the profits arising from the reversal of taxable temporary differences, and economic and industry outlooks. Management periodically reviews on these factors.

Details of deductible (taxable) temporary differences unrecognized as deferred tax assets (liabilities) as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**	
Investments in subsidiaries, associates and joint ventures	(161,065)	(125,485)	Permanently re-invested income not distributed as dividend
	5,737,439	893,853	No possibility of disposal
Goodwill	(694,422)	(694,422)	
Land	488	488	
Unused tax loss carryforwards	345,652	305,471	Uncertainty of future tax income

The maturity of unused loss is as follows:

(in millions of Korean won)	**Less than 1 year**	**Between 1-2 years**	**Between 2-5 years**	**Over 5 years**
2020 Tax loss carryforwards	165	2,497	14,501	480,651
2019 Tax loss carryforwards	93,677	46,962	30,760	341,155

29. Earnings per Share

Basic earnings per share is calculated by dividing the profit attributable to equity holders of the Parent Company by the weighted average number of shares in issue excluding shares purchased by the Parent Company and held as treasury shares. As at the reporting date, the Parent Company has no potential ordinary shares. Preferred shares have a right to participate in the profits of the Group. These participation rights have been considered in presenting the earnings per share information for the both of ordinary shares and preferred shares.

Basic earnings per share for profit from continuing operations and earnings per share attributable to the equity holders of the Parent Company for the years ended December 31, 2020 and 2019, are computed as follows:

Basic earnings per ordinary share from continuing operations

(in millions of Korean won and in number of shares)	**2020**	**2019**
Profit from continuing operations attributable to ordinary shares[1]	365,192	307,875
Weighted average number of ordinary shares outstanding[2]	69,177,128	68,939,926
Basic earnings per ordinary share from continuing operations *(in won)*	5,279	4,466

Basic earnings per ordinary share

(in millions of Korean won and in number of shares)	**2020**	**2019**
Profit attributable to ordinary shares[1]	461,109	281,637
Weighted average number of ordinary shares outstanding[2]	69,177,128	68,939,926
Basic earnings per ordinary shares *(in won)*	6,666	4,085

Basic earnings per preferred share from continuing operations

(in millions of Korean won and in number of shares)	**2020**	**2019**
Profit from continuing operations attributable to preferred share[1]	40,887	34,648
Weighted average number of preferred shares outstanding[2]	7,672,433	7,672,433
Basic earnings per preferred share from continuing operations *(in won)*	5,329	4,516

Basic earnings per preferred share

(in millions of Korean won and in number of shares)	**2020**	**2019**
Profit attributable to preferred shares[1]	51,525	31,728
Weighted average number of preferred shares outstanding[2]	7,672,433	7,672,433
Basic earnings per preferred shares *(in won)*	6,716	4,135

[1] Profit attributable to ordinary and preferred shares are as follows:

(in millions of Korean won)	**2020**	**2019**
Profit from continuing operations attributable to the equity holders of the Parent Company	406,079	342,523
Ordinary shares dividends (A)	691,771	137,880
Preferred shares dividends (B)	77,108	15,728
Undistributed earnings from continuing operation for the period	(362,800)	188,915
Undistributed earnings available for ordinary shares (C)	(326,578)	169,995
Undistributed earnings available for preferred shares (D)	(36,222)	18,920
Profit from continuing operations for the period attributable to ordinary shares (A+C)	365,192	307,875
Profit from continuing operations for the period attributable to preferred shares (B+D)	40,887	34,648

(in millions of Korean won)	**2020**	**2019**
Profit attributable to the equity holders of the Parent Company	512,634	313,365
Ordinary shares dividends (A)	691,771	137,880
Preferred shares dividends (B)	77,108	15,728
Undistributed earnings for the period	(256,245)	159,757
Undistributed earnings available for ordinary shares (C)	(230,662)	143,757
Undistributed earnings available for preferred shares (D)	(25,583)	16,000
Profit for the period attributable to ordinary shares (A+C)	461,109	281,637
Profit for the period attributable to preferred shares (B+D)	51,525	31,728

[2] Weighted average numbers of shares are calculated as follows:

		2020		
Ordinary shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2020. 1. 1 – 2020 12. 31	68,939,926	366	25,232,012,916
Conversion of treasury shares	2020. 8. 1 - 2020. 12. 31	47,277	153	7,233,381
	2020. 9. 1 - 2020. 12. 31	446,115	122	54,426,030
	2020. 10. 1 - 2020. 12. 31	16,212	92	1,491,504
	2020. 11. 1 - 2020. 12. 31	50,658	61	3,090,138
	2020. 12. 1 - 2020. 12. 31	663,707	31	20,574,917
Total				25,318,828,886

Weighted average number of ordinary shares outstanding: 25,318,828,886 / 366 = 69,177,128 shares

		2020		
Preferred shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2020. 1. 1 - 2020. 12. 31	7,672,433	366	2,808,110,478
Total				2,808,110,478

Weighted average number of preferred shares outstanding: 2,808,110,478 / 366 = 7,672,433 shares

		2019		
Ordinary shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2019. 1. 1 - 2019. 12. 31	68,939,926	365	25,163,072,990
Total				25,163,072,990

Weighted average number of ordinary shares outstanding: 25,163,072,990 / 365 = 68,939,926 shares

		2019		
Preferred shares outstanding	**Period**	**Number of shares**	**Number of days**	**Number of shares x days**
Beginning balance	2019. 1. 1 - 2019. 12. 31	7,672,433	365	2,800,438,045
Total				2,800,438,045

Weighted average number of preferred shares outstanding: 2,800,438,045 / 365 = 7,672,433 shares

For the year ended December 31, 2020, the Parent Company did not calculate diluted earnings per share due to antidilution.

(in millions of Korean won and in number of shares)	**2019**
Diluted earnings per ordinary shares from continuing operations	
Profit from continuing operation for the period attributable to ordinary shares	307,875
Loss on exchangeable bonds (after tax effects)	(9,458)
Profit from continuing operation used in calculating diluted earnings per share from continuing operation	298,417
Weighted average number of ordinary shares outstanding	68,939,926
Adjustments for calculation of diluted earnings per share:	
Assumed conversion of exchangeable bonds	1,284,734
Weighted average number of ordinary shares and potential ordinary shares used as the denominator in calculating diluted earnings per share from continuing operation	70,224,660
Diluted earnings per share from continuing operation attributable to the ordinary shares *(in won)*	4,249

(in millions of Korean won and in number of shares)	**2019**
Diluted earnings per ordinary shares	
Profit for the period attributable to the ordinary shares	281,637
Loss on exchangeable bonds (after tax effects)	(9,507)
Profit used in calculating diluted earnings per share	272,130
Weighted average number of ordinary shares outstanding	68,939,926
Adjustments for calculation of diluted earnings per share:	
Assumed conversion of exchangeable bonds	1,284,734
Weighted average number of ordinary shares and potential ordinary shares used as the denominator in calculating diluted earnings per share	70,224,660
Diluted earnings per share attributable to the ordinary shares *(in won)*	3,875

(in millions of Korean won and in number of shares)	**2019**
Diluted earnings per preferred shares from continuing operations	
Profit from continuing operation for the period attributable to preferred shares	34,648
Loss on exchangeable bonds (after tax effects)	(1,661)
Profit from continuing operation used in calculating diluted earnings per share from continuing operation	32,987
Weighted average number of ordinary shares outstanding	
Adjustments for calculation of diluted earnings per share:	7,672,433
Assumed conversion of exchangeable bonds	-
Weighted average number of ordinary shares and potential ordinary shares used as the denominator in calculating diluted earnings per share from continuing operation	7,672,433
Diluted earnings per share from continuing operation attributable to the preferred shares *(in won)*	4,299

(in millions of Korean won and in number of shares)	**2019**
Diluted earnings per preferred shares	
Profit for the period attributable to the preferred shares	31,727
Loss on exchangeable bonds (after tax effects)	(1,612)
Profit used in calculating diluted earnings per share	30,115
Weighted average number of ordinary shares outstanding	
Adjustments for calculation of diluted earnings per share:	7,672,433
Assumed conversion of exchangeable bonds	-
Weighted average number of ordinary shares and potential ordinary shares used as the denominator in calculating diluted earnings per share	7,672,433
Diluted earnings per share attributable to the preferred shares *(in won)*	3,925

Basic and diluted earnings (losses) per share attributable to ordinary and preferred shares from discounted operations for the years ended December 31, 2020 and 2019, are as follows:

(in Korean won)	**2020**	**2019**
Basic earnings (losses) per ordinary share from discounted operations	1,387	(381)
Basic earnings (losses) per preferred share from discounted operations	1,387	(381)
Diluted earnings (losses) per ordinary share from discounted operations	1,387	(374)
Diluted earnings (losses) per preferred share from discounted operations	1,387	(374)

30. Dividends

Details of dividends of the Parent Company as at December 31, 2020 and 2019, are as follows:

	2020	2019
Number of shares entitled to dividends: shares issued and outstanding (par value per share: ₩5,000)		
Ordinary shares	70,127,501	68,939,926
Preferred shares	7,672,432	7,672,433
Dividend per share *(in Korean won, %)*		
Ordinary shares: cash	10,000 (200%)	2,000 (40%)
Preferred shares: cash	10,050 (201%)	2,050 (41%)
Cash dividends to distribute *(in millions of Korean won)*		
Ordinary shares	701,275	137,880
Preferred shares	77,108	15,728
	778,383	153,608

Dividend payout ratios of the Parent Company for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020	2019
Dividends (A)	778,383	153,608
Profit attributable to equity holders of the Parent Company (B)	512,634	313,365
Dividend payout ratio (A/B)	151.84%	49.02%

Dividend yield ratios of the Parent Company for the years ended December 31, 2020 and 2019, are as follows:

	2020		2019	
(in Korean won)	Ordinary shares	Preferred Shares	Ordinary shares	Preferred Shares
Dividend per share (A)	10,000	10,050	2,000	2,050
Market value at the end of year (B)[1]	808,750	377,375	312,000	171,500
Dividend yield ratio (A/B)	1.24%	2.66%	0.64%	1.20%

[1] Average price in the stock market during one week preceding two business days before shareholder list closing date for the general shareholders' meeting.

31. Related Party Transactions

As at December 31, 2020 and 2019, LG Corp. is an entity exercising a significant influence over the Group, which owns 33.34% of the Parent Company's ordinary shares.

Details of associates and other related parties that have sales and other transactions with the Group or have receivables and payables balances as at December 31, 2020 and 2019, are as follows, and the details of investments in subsidiaries, associates and joint ventures are described in Note 1.3:

Related party	Related party's subsidiary (Domestic)	Related party's subsidiary (Overseas)	Details
S&I Corp.	S&I CM	S&I CM NANJING Co., Ltd. and others	Subsidiary of LG Corp.
LG CNS Co., Ltd.	Biz Tech Partners Co., Ltd. and others	LG CNS America Inc. and others	Subsidiary of LG Corp.
LG Management Development Institute	-	-	Subsidiary of LG Corp.
LG Sports Ltd.	-	-	Subsidiary of LG Corp.
LG Holdings Japan	-	-	Subsidiary of LG Corp.
LG MMA Corporation	-	-	Joint venture of LG Corp.
LG Display Co., Ltd.	-	LG Display (China) Co., Ltd. and others	LG Enterprise group[1]
LG Electronics, Inc.	LG Innotek Co., Ltd. and others	Inspur LG Digital Mobile Communications Co., Ltd. and others	LG Enterprise group[1]
LG International Corp.	Pantos Logistics Co., Ltd. and others	LG International (Japan) Ltd. and others	LG Enterprise group[1]
LG Hausys, Ltd.	-	LG Hausys Tianjin Co., Ltd. and others	LG Enterprise group[1]
LG Household & Health Care Ltd.	Coca-Cola Beverage Co. and others	-	LG Enterprise group[1]
LG Uplus Corp.	LG HelloVision Corp.	-	LG Enterprise group[1]
G Ⅱ R Inc.	HS AD Inc.	Beijing Yuanzhimeng Advertising Co., Ltd.	LG Enterprise group[1]
Silicon Works Co., Ltd.	-	-	LG Enterprise group[1]
SERVEONE[2]	-	Serveone(Nanjing).Co., Ltd. and others	LG Enterprise group[1]

[1] Although these entities are not the related parties of the Group in accordance with K-IFRS 1024, these entities belong to a large enterprise group in accordance with the Monopoly Regulation and Fair Trade Act.

[2] During 2019, SERVEONE has been excluded from other related parties as S&I Corp. has sold its shares of SERVEONE.

Sales and purchases with related parties for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020					
		Purchase and others				
	Sales and others	Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Acquisition of right-of-use assets	Interest expense	Others
Entity with a significant influence over the Group						
LG Corp.	14	-	-	-	167	60,718
Associates and joint ventures						
SEETEC Co., Ltd.	56,396	135,799	10	618	86	78,908
TECWIN Co., Ltd.	25	318	4,662	-	-	211
HL Greenpower Co., Ltd.	853,423	-	-	-	-	3,530
Others	54	4,678	-	-	-	2,482
Other related parties						
LG MMA Corporation[1]	84,486	136,506	-	-	-	3,320
S&I Corp. and its subsidiaries	337	30,472	618,098	-	-	87,470
LG CNS Co., Ltd. and its subsidiaries	13,156	4,524	397,358	-	16	107,325
Others	14	-	-	583	2	16,470
Others						
LG Display Co., Ltd. and its subsidiaries	861,285	98	879	891	6	314
LG Electronics Inc. and its subsidiaries[2]	1,187,949	822,786	326,358	1,910	10	110,628
LG International Corp. and its subsidiaries	57,992	324,691	148,452	1,181	4	465,694
LG Hausys, Ltd. and its subsidiaries	171,063	1,861	5,665	-	1	6,227
Others	7,847	22,830	2,236	1,605	29	6,960
Total	3,294,041	1,484,563	1,503,692	6,788	321	950,257

(in millions of Korean won)

	2019					
		Purchase and others				
	Sales and others	Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Acquisition of right-of-use assets	Interest expense	Others
Entity with a significant influence over the Group						
LG Corp.	2,666	-	-	-	-	73,171
Associates and joint ventures						
SEETEC Co., Ltd.	49,774	197,502	342	2,775	14	90,611
TECWIN Co., Ltd.	3	55	4,728	-	-	220
HL Greenpower Co., Ltd.	834,289	-	-	-	-	1,148
Others	196	27	1	-	-	2,937
Other related parties						
LG MMA Corporation[1]	108,957	190,917	-	-	-	6,087
S&I Corp. and its subsidiaries[2]	11,234	755,355	620,251	-	-	139,372
LG CNS Co., Ltd. and its subsidiaries	18,258	3,862	344,607	-	-	87,073
Others	5	-	-	530	7	18,154
Others						
LG Display Co., Ltd. and its subsidiaries	1,123,640	148	80,116	37	-	2,151
LG Electronics Inc. and its subsidiaries	960,332	575,282	728,049	-	-	106,866
LG International Corp. and its subsidiaries	185,471	454,183	43,235	28	-	537,084
LG Hausys, Ltd. and its subsidiaries	191,851	7,633	4,483	113	-	7,079
Others	14,499	23,901	1,041	280	2	12,652
Total	3,501,175	2,208,865	1,826,853	3,763	23	1,084,605

[1] Net sales and purchase amounts after offsetting for Raffinate transactions with LG MMA.
[2] In October 2020, LG Energy Solution Michigan Inc, a subsidiary, entered into an agreement to acquire automotive battery pack manufacturing facilities from LG Electronics Inc. for approximately USD 37 million.
[3] SERVEONE has been excluded from the related parties as at December 31, 2019 since S&I Corp. sold its shares of SERVEONE in 2019. Transactions with SERVEONE until the sale of shares have been included in the above information.

Balances of receivables and payables arising from sales and purchases of goods and services as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020			
	Receivables			
	Trade receivables and others	Loan receivables	Other receivables	Total
Entity with a significant influence over the Group				
LG Corp.	-	-	12,420	12,420
Associates and joint ventures				
SEETEC Co., Ltd.	3,820	-	201	4,021
TECWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	-	-	-	-
Others	-	-	22	22
Other related parties				
LG MMA Corporation	3,186	-	534	3,720
S&I Corp. and its subsidiaries[1]	6	-	8,783	8,789
LG CNS Co., Ltd. and its subsidiaries	7,048	-	85	7,133
Others	606	-	4,360	4,966
Others				
LG Display Co., Ltd. and its subsidiaries	152,152	-	27,792	179,944
LG Electronics Inc. and its subsidiaries	245,176	-	111,549	356,725
LG International Corp. and its subsidiaries	4,710	-	-	4,710
LG Hausys, Ltd. and its subsidiaries	34,977	-	31	35,008
Others	128	-	1,163	1,291
Total	451,809	-	166,940	618,749

(in millions of Korean won)

	2020				
	Payables				
	Trade payables	Borrowings	Lease liabilities	Other payables	Total
Entity with a significant influence over the Group					
LG Corp.	-	-	11,934	4,013	15,947
Associates and joint ventures					
SEETEC Co., Ltd.	14,977	-	26,014	9,884	50,875
TECWIN Co., Ltd.	-	-	-	574	574
HL Greenpower Co., Ltd.	-	-	-	-	-
Others	194	-	-	272	466
Other related parties					
LG MMA Corporation	13,272	-	-	-	13,272
S&I Corp. and its subsidiaries[1]	30	-	-	265,647	265,677
LG CNS Co., Ltd. and its subsidiaries	4	-	1,206	164,632	165,842
Others	-	-	92	289	381
Others					
LG Display Co., Ltd. and its subsidiaries	-	-	703	115	818
LG Electronics Inc. and its subsidiaries	133,330	-	1,792	254,868	389,990
LG International Corp. and its subsidiaries	23,654	-	575	74,267	98,496
LG Hausys, Ltd. and its subsidiaries	-	-	-	3,965	3,965
Others	1,869	-	1,101	6,224	9,194
Total	187,330	-	43,417	784,750	1,015,497

(in millions of Korean won)

	2019			
	Receivables			
	Trade receivables and others	Loan receivables	Other receivables	Total
Entity with a significant influence over the Group				
LG Corp.	-	-	12,391	12,391
Associates and joint ventures				
SEETEC Co., Ltd.	4,140	-	636	4,776
TECWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	54,907	-	-	54,907
Others	-	-	10	10
Other related parties				
LG MMA Corporation	8,425	-	844	9,269
S&I Corp. and its subsidiaries[1]	8	-	24,574	24,582
LG CNS Co., Ltd. and its subsidiaries	7,650	-	-	7,650
Others	607	-	4,356	4,963
Others				
LG Display Co., Ltd. and its subsidiaries	128,562	-	74	128,636
LG Electronics Inc. and its subsidiaries	231,821	-	21,095	252,916
LG International Corp. and its subsidiaries	13,861	-	-	13,861
LG Hausys, Ltd. and its subsidiaries	19,995	-	262	20,257
Others	39	-	1,096	1,135
Total	470,015	-	65,338	535,353

(in millions of Korean won)

	2019				
	Payables				
	Trade payables	Borrowings	Lease liabilities	Other payables	Total
Entity with a significant influence over the Group					
LG Corp.	-	-	14,863	1,360	16,223
Associates and joint ventures					
SEETEC Co., Ltd.	15,781	-	1,402	11,375	28,558
TECWIN Co., Ltd.	-	-	-	1,633	1,633
HL Greenpower Co., Ltd.	-	-	-	65	65
Others	-	-	-	258	258
Other related parties					
LG MMA Corporation	13,413	-	-	-	13,413
S&I Corp. and its subsidiaries[1]	19	-	-	300,928	300,947
LG CNS Co., Ltd. And its subsidiaries	860	-	1,206	163,654	165,720
Others	-	-	93	462	555
Others					
LG Display Co., Ltd. and its subsidiaries	7	-	9	87	103
LG Electronics Inc. and its subsidiaries	115,622	-	448	436,962	553,032
LG International Corp. and its subsidiaries	10,398	-	20	97,017	107,435
LG Hausys, Ltd. and its subsidiaries	512	-	50	5,925	6,487
Others	1,706	-	168	4,328	6,202
Total	158,318	-	18,259	1,024,054	1,200,631

[1] Other receivables to S&I Corp. include the amount of deposits which are classified as memberships in the financial statements of the Group.

Fund transactions with related parties for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020						
				Loans		Borrowings[1]	
	Dividends received	Dividends paid	Equity contributions in cash (capital reduction)	Loans	Repayment	Borrowings	Repayment
Entity with a significant influence over the Group							
LG Corp.	-	47,068	-	-	-	167	14,699
Associates and joint ventures							
SEETEC Co., Ltd.	10,000	-	-	-	-	86	3,506
TECWIN Co., Ltd.	314	-	-	-	-	-	-
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO.,Ltd	-	-	22,191	-	-	-	-
WUXI CL New Energy Technology	-	-	(1,178)	-	-	-	-
Other related parties							
LG CNS Co., Ltd.	-	-	-	-	-	16	1,190
LG Holdings Japan Co.,Ltd.	-	-	-	-	-	583	482
Others							
LG Display America,Inc.	-	-	-	-	-	891	85
Pantos Logistics (China) Co., Ltd.	-	-	-	-	-	-	21
Pantos Logistics France	-	-	-	-	-	854	415
Pantos Logistics Spain S.L.	-	-	-	-	-	328	159
LG Electronics Deutschland GmbH	-	-	-	-	-	1,910	4,390
LG Hausys, Ltd.	-	-	-	-	-	56	8
LG HOUSEHOLD & HEALTH CARE LTD	-	-	-	-	-	29	697
Total	10,314	47,068	21,013	-	-	4,920	25,652

(in millions of Korean won)

	2019						
				Loans		Borrowings[1]	
	Dividends received	Dividends paid	Equity contributions in cash (capital reduction)	Loans	Repayment	Borrowings	Repayment
Entity with a significant influence over the Group							
LG Corp.	-	141,205	-	-	-	-	-
Associates and joint ventures							
SEETEC Co., Ltd.	10,000	-	-	-	-	2,775	1,027
LG Holdings (HK) Ltd.	-	-	(15,788)	-	-	-	-
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO.,LTD	-	-	41,202	-	-	-	-
VINFAST LITHIUM BATTERY PACK LLC.	-	-	5,323	-	-	-	-
Combusition Synthesis Co., Ltd	-	-	645	-	-	-	-
Other related parties							
LG Holdings Japan Co.,Ltd.	-	-	-	-	-	530	463
Others							
LG Display America,Inc.	-	-	-	-	-	37	28
Pantos Logistics (China) Co., Ltd.	-	-	-	-	-	35	14
LG Hausys, Ltd.	-	-	-	-	-	113	39
LG HOUSEHOLD & HEALTH CARE LTD	-	-	-	-	-	280	105
Total	10,000	141,205	31,382	-	-	3,770	1,676

[1] The amounts represent lease liabilities that were recognized or repaid for the years ended December 31, 2020.

Compensation for key management of the Group for the years ended December 31, 2020 and 2019, consists of:

(in millions of Korean won)	**2020**	**2019**
Short-term employee benefits	92,430	83,330
Post-employment benefits	7,005	4,999
Total	99,435	88,329

Key management includes directors and audit committee members having duties and responsibilities over planning, operations and controlling of the Group's business activities.

There are no provisions recognized against receivables from related parties as at December 31, 2020 and 2019; therefore, there are no impairment losses recognized against the receivables from related parties for the years ended December 31, 2020 and 2019.

As at December 31, 2020, there are no payment guarantees provided by the Group for related parties.

32. Cash Generated from Operations

Reconciliation between profit before income tax and cash generated from operations for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Profit before income tax		
Profit before income tax from continuing operations	943,692	574,443
Profit before income tax from discontinued operations	162,856	(13,883)
	1,106,548	560,560
Adjustments for:		
Depreciation	2,129,986	1,719,597
Amortization	180,973	136,870
Post-employment benefits	200,660	167,274
Finance income	(55,302)	(184,059)
Finance costs	790,030	387,285
Foreign exchange differences	10,363	5,751
Loss (gain) on valuation of inventories	(7,756)	12,640
Gain on disposal of property, plant and equipment	(17,506)	(11,602)
Gain on disposal of intangible assets	(104)	(405)
Gain on disposal of other assets	(2,771)	-
Loss on disposal of property, plant and equipment	81,402	45,913
Loss on disposal of intangible assets	1,776	1,726
Reversal of impairment loss on property, plant and equipment	(220)	(215)
Impairment loss on property, plant and equipment	76,037	125,560
Impairment loss on intangible assets	138,547	61,750
Impairment loss on other assets	23	-
Gain on disposal of investments in associates	(312,080)	(599)
Gain on disposal of business	(32,085)	-
Additions to provisions	961,040	685,031
Other income	10,668	8,778
Increase in inventories	(565,687)	(718,805)
Decrease (increase) in trade receivables	(3,181,776)	595,234
Decrease (increase) in other receivables	(142,121)	81,139
Decrease (increase) in other current assets	53,343	(147,130)
Settlement of derivative instrument transactions	(733)	-
Increase in trade payables	3,651,513	217,041
Increase in other payables	1,583,217	934,698
Increase (decrease) in other current liabilities	340,058	(214,744)
Decrease in provisions	(319,861)	(285,956)
Decrease in net defined benefit liabilities	(228,316)	(282,235)
Other cash flows from operations	76,778	(64,636)
Cash generated from operations	6,526,644	3,836,461

Changes in liabilities arising from financial activities for the year ended December 31, 2020, are as follows:

(in millions of Korean won)	2020						
	At January 1, 2020	**Cash flows from financing activities**	**Reclassification of current portion**	**Amortization**	**Lease liabilities**	**Others**	**At December 31, 2020**
Short-term borrowings	1,136,154	(602,203)	748,905	-	-	(6,507)	1,276,349
Long-term borrowings	1,758,958	2,272,499	(748,905)	-	99,160	(121,222)	3,260,490
Debentures	5,519,156	786,604	-	17,097	-	(673,579)	5,649,278
Exchange rights	930	-	-	-	-	15,867	16,797
Other payables for the reverse factoring arrangement	856,287	(1,577,805)	-	-	-	2,802,825	2,081,307
Total	9,271,485	879,095	-	17,097	99,160	2,017,384	12,284,221

The significant non-cash transactions for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Reclassification of construction-in-progress	5,421,750	5,117,685
Reclassification of machinery-in-transit	72,815	208,708
Reclassification of long-term borrowings into current portion	1,662,047	1,010,178
Reclassification of other payables under the reverse factoring arrangement	2,802,825	862,452
Other payables related to acquisitions of property, plant and equipment and intangible assets	1,786,346	2,344,088
Transfer of non-current assets held for sale	777,695	-
Transfer of non-current liabilities held for sale	130,383	--
Exchange of treasury stocks such as exchangeable bonds	917,592	-

33. Segment Information

General information about the Group's reportable segments is as follows:

Segment	Products or services	Major customers
Petrochemicals	ABS, PC, PE, PP, Acrylic, Alcohol, SAP, PVC, Synthetic rubber, Special resin, BPA, Ethylene, Propylene and others	LG Electronics Inc., OCI Group Co. Ltd., Mitsubishi Corp. and others
Energy solutions	Mobile batteries, Automotive batteries, Electricity storage batteries and others	Hewlett-Packard Co., General Motors Corp., and others
Advanced materials[1]	OLED Polarizers, Automotive components, LCD Photoresist, OLED materials, Battery materials and others	LG Display Co., Ltd., Samsung Display Co., Ltd., BOE, AUO and others
Life sciences	Growth hormone, Vaccine, Antidiabetic, agricultural chemicals and others	HUADONG NINGBO, UNICEF, Intervet and others
Common and others[1]	Crop protection products, Seeds, Fertilizers, General management, sales and R&D and others	National Agriculture Cooperative Federation and others

[1] Part of the Advanced materials business was reclassified into the Common and others business sector. The information for the comparative period has been restated to reflect these changes.

The segment information on revenue, profit and loss for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020					
	Petro-chemicals	**Energy solutions**	**Advanced materials**	**Life sciences**	**Common and others[3]**	**Total**
Total segment revenue	14,268,536	12,363,633	3,610,823	661,363	868,666	31,773,021
Inter-segment revenue	540,198	109	1,047,274	3,086	105,844	1,696,511
Revenue from external customers[1]	13,728,338	12,363,524	2,563,549	658,277	762,822	30,076,510
Operating profit (loss)[2]	1,967,925	(165,634)	162,864	53,836	(220,832)	1,798,159

(in millions of Korean won)	2019					
	Petro-chemicals	**Energy solutions**	**Advanced materials**	**Life sciences**	**Common and others[3]**	**Total**
Total segment revenue	15,547,871	8,350,251	3,736,122	627,802	819,734	29,081,780
Inter-segment revenue	554,857	-	1,111,246	5,618	56,981	1,728,702
Revenue from external customers[1]	14,993,014	8,350,251	2,624,876	622,184	762,753	27,353,078
Operating profit (loss)[2]	1,417,851	(454,312)	14,445	37,199	(189,768)	825,415

[1] Revenue from external customers consists of sales of goods. Interest income and dividend income are included in finance income.
[2] Management assesses the performance of the operating segments based on a measurement of operating profit of segment.
[3] Common and other segments include operating segments not qualifying as a reportable segment, supporting divisions as well as R&D divisions.

The segment information on assets and liabilities as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won	2020					
	Petro-chemicals	**Energy solutions**	**Advanced materials**	**Life sciences**	**Common and others**	**Total**
Reportable segment asset[1]	11,539,470	19,577,416	3,095,366	1,928,129	5,248,513	41,388,894
Investments in associates and joint ventures	6,604	48,350	89,525	17	164,833	309,329
Reportable segment liability[1]	3,540,685	12,024,260	1,142,234	211,806	5,679,469	22,598,454

(in millions of Korean won	2019					
	Petro-chemicals	**Energy solutions**	**Advanced materials**	**Life sciences**	**Common and others**	**Total**
Reportable segment asset[1]	10,564,216	12,091,983	3,618,226	1,906,005	5,843,996	34,024,426
Investments in associates and joint ventures	5,132	28,254	67,059	17	207,115	307,577
Reportable segment liability[1]	3,358,939	6,587,857	687,400	232,049	5,774,392	16,640,637

[1] Assets and liabilities are measured in a manner consistent with those in the financial statements, and allocated on the basis of segment operation.

The external sales and non-current assets by geographical segments from continuing operations for the years ended December 31, 2020 and 2019, and as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**Sales**		**Non-current assets[1]**	
	2020	**2019**	**2020**	**2019**
Korea[2]	8,287,876	8,430,399	14,656,257	13,208,426
China	8,913,290	8,319,911	3,690,486	3,975,505
Asia	3,283,064	3,739,497	34,876	58,990
America	2,601,486	1,871,443	656,190	559,051
Europe	6,662,579	4,583,211	3,859,016	3,051,227
Others	328,215	408,617	-	-
Total	30,076,510	27,353,078	22,896,825	20,853,199

[1] Represents aggregate amount of property, plant and equipment, intangible assets and investment properties.
[2] Domestic sales include the exports made through local letters of credit.

There is no single external customer who contributes over 10% of the Group's revenue for the years ended December 31, 2020 and 2019.

34. Assets and Liabilities Held for Sale and Discontinued Operations

34.1 Assets and Liabilities Held for Sale

Upon the approval of management, the Group decided to dispose of six lines of small pouch assembly facilities and others (June 2019), acrylic film business (December 2020), and LCD polarizer business (June 2020). The related assets and liabilities were reclassified as assets and liabilities held for sale. The disposal of small pouch assembly facility business is pending due to the delay in factory establishment by the buyer, but the transaction is expected to be completed in the first half of 2021. The disposal of acrylic film business is expected to be completed in the second half of 2021. In addition, the disposal of land acquired as part of acquisition of Farm Hannong Co., Ltd. is expected to be completed in the first half of 2021 and the disposal of LCD polarizer business has been completed in February 2021.

Details of assets and liabilities of disposal group classified as held for sale as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Assets of disposal group		
Inventories	185,693	-
Property, plant and equipment	570,374	19,573
Intangible assets	8,086	-
Others	24,919	-
Total	789,072	19,573
Liabilities of disposal group		
Borrowings and others	130,383	-
Total	130,383	-

Assets of the disposal group were measured at net fair value immediately before the initial classification as assets as held for sale and there are no other non-operating expenses (income) recognized from the measurement for the years ended December 31, 2020 and 2019.

The Group recognized cumulative losses of ₩2,095 million directly to other comprehensive income in relation to the disposal groups classified as held for sale.

34.2 Discontinued Operations

The Group decided to discontinue Glass substrate business with the resolution of the Board of Directors in January 2020 and substantially discontinued the related business as of March 2020. In addition, the Group decided to dispose of LCD polarizer business with the resolution of the Board of Directors in June 2020, and the disposal has been completed in February 2021. Accordingly, the profit and loss from the related operations are presented as discontinued operations and the comparative consolidated statements of profit or loss have been restated.

Comprehensive income information from discontinued operation for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020		
	LCD polarizer	**Glass substrate**	**Total**
Revenue	1,312,590	43,901	1,356,491
Expense	(1,109,989)	(83,646)	(1,193,635)
Gain (loss) before income tax of discontinued operation	202,601	(39,745)	162,856
Income tax benefits (expense)	(64,213)	7,912	(56,301)
Gain (loss) after income tax of discontinued operations	138,388	(31,833)	106,555

(in millions of Korean won)	2019		
	LCD polarizer	**Glass substrate**	**Total**
Revenue	1,252,876	57,440	1,310,316
Expense	(1,153,514)	(170,685)	(1,324,199)
Gain (loss) before income tax of discontinued operation	99,362	(113,245)	(13,883)
Income tax benefits (expense)	(35,570)	20,295	(15,275)
Gain (loss) after income tax of discontinued operations	63,792	(92,950)	(29,158)

Net cash flows from discontinued operations for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020		
	LCD polarizer	**Glass substrate**	**Total**
Net cash inflow (outflow) from operating activities	216,331	(3,963)	212,368
Net cash inflow (outflow) from investing activities	119,019	33,111	152,130
Net cash inflow (outflow) from financing activities	(323,171)	(29,148)	(352,319)

(in millions of Korean won)	2019		
	LCD polarizer	**Glass substrate**	**Total**
Net cash inflow (outflow) from operating activities	205,943	(16,238)	189,705
Net cash outflow from investing activities	(90,404)	(38,820)	(129,224)
Net cash inflow (outflow) from financing activities	(115,793)	55,058	(60,735)

35. Assets and Liabilities related to Contracts with Customers

Assets and liabilities related to contracts with customers as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Contract assets		
A right to recover the product	4,729	5,191
Total contract assets	4,729	5,191
Contract liabilities		
Advances in relation to revenue from the Group's main business activities	265,688	204,337
Expected services to be transferred	-	3,500
Expected customer incentives	5,394	6,400
Unearned revenue	26,036	34,247
Expected refunds	8,631	10,893
Total contract liabilities	305,749	259,377

Revenue recognized in relation to contract liabilities

The following table shows how much of the revenue recognized in the current reporting period relates to carried-forward contract liabilities and how much relates to performance obligations that were satisfied in the prior periods.

(in millions of Korean won)	**2020**	**2019**
Revenue recognized in the current period from the contract liability balance at the beginning of the period	179,431	81,688
Advances in relation to revenue from the Group's main business activities	162,509	75,085
Unearned revenue	13,422	2,068
Expected services to be transferred	3,500	4,535
Revenue recognized from performance obligations satisfied in previous periods	-	-

36. Investment Properties

Details of investment properties as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020				2019			
	Cost	Accumulated depreciation	Accumulated impairment	Book amount	Cost	Accumulated depreciation	Accumulated impairment	Book amount
Land	4,211	-	-	4,211	4,368	-	-	4,368
Buildings	54,457	(9,225)	(10)	45,222	61,242	(12,202)	(80)	48,960
Total	58,668	(9,225)	(10)	49,433	65,610	(12,202)	(80)	53,328

Changes in investment properties for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020			2019		
	Land	Building	Total	Land	Building	Total
Beginning balance	4,368	48,960	53,328	486	464	950
Acquisitions/transfers	-	2,644	2,644	3,882	49,722	53,604
Disposals/transfers	(157)	(5,221)	(5,378)	-	-	-
Depreciation	-	(1,161)	(1,161)	-	(1,226)	(1,226)
Ending balance	4,211	45,222	49,433	4,368	48,960	53,328

The fair value of investment properties is measured either by independent professional appraisers with certified qualification or measured based on official appraised value of land and available information from recent transactions of similar properties, and it is classified as 'level 3' of the fair value hierarchy. The fair value of investment properties as at December 31, 2020, is ₩51,625 million.

Rental income from investment properties under operating lease is ₩6,819 million, and operating expenses incurred for investment properties that generated rental income (including maintenance and repair expenses) are ₩1,149 million. Operating expenses incurred for investment properties that do not generate rental income (including maintenance and repair expenses) are ₩12 million.

Operating lease

Investment properties are leased to tenants under operating leases with monthly rent payments. Where considered necessary to reduce credit risk, the Group may obtain bank guarantees for the term of the lease.

Although the Group is exposed to changes in the residual value at the end of the current leases, the Group typically enters into new operating leases and therefore will not immediately realize any reduction in residual value at the end of these leases. Expectations about the future residual values are reflected in the fair value of investment properties.

The future minimum lease payments expected to be received in relation to the above operating lease agreement for investment properties as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	**2020**	**2019**
Within one year	503	6,848
Within two years	172	-
Within five years	500	-
Total	1,175	6,848

37. Events after the Reporting Period

(a) The Group decided to issue non-guaranteed public corporate bonds at the Management Committee held on January 25, 2021 and issued such corporate bonds of ₩1,200,000 million on February 19, 2021.

(in millions of Korean won)	**Maturity date**	**Amount**
54-1st Debenture (non-guaranteed/public)	2024.02.19	350,000
54-2nd Debenture (non-guaranteed/public)	2026.02.19	270,000
54-3rd Debenture (non-guaranteed/public)	2028.02.19	200,000
54-4th Debenture (non-guaranteed/public)	2031.02.19	260,000
54-5th Debenture (non-guaranteed/public)	2036.02.19	120,000

(b) The sale of LCD polarizer business, which was classified as assets held for sale upon the resolution of the Board of Directors in June 2020, was completed in February 2021.

38. Approval of Issuance of the Financial Statements

The consolidated financial statements 2020 were approved for issue by the board of directors on March 4, 2021 and are subject to change with the approval of shareholders at their annual general meeting.

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