

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Hyosung was established on November 3, 1966. Hyosung was divided into the operating holding company, Hyosung Corporation (Hereafter Hyosung), which is in charge of group-wide investment plans and management of subsidiaries' stakes, and for companies- Hyosung TNC Corp., Hyosung Heavy Industries Corp., Hyosung Advanced Material Corp. and Hyosung Chemical Corp., whose business area covers textile•trading, heavy industries•construction, industrial materials and chemicals, respectively.

The headquarter office is located in Seoul, Korea, and car carpet manufacturing plants, R&D centers, and Heavy Industries research centers are in operation in Anyang.

Key products such as car carpet, BCF yarn business is expected to grow together with the car industry

Hyosung has established its Green Management Vision 2030 to become an eco-friendly company that pioneers a better life for mankind. We have established four goals: reducing greenhouse gas emissions, developing eco-friendly technologies and expanding markets, creating an eco-friendly corporate culture and enhancing stakeholder trust. A company-wide climate change response strategy has been established based on specific tasks for each goal.

To meet the industry sector goal of South Korea's Nationally Determined Contribution (NDC) announced in 2021, we have updated our quantitative GHG reduction target of the Green Management Vision 2030 from 20.5% reduction compared to 2017 emission to 14.5% reduction compared to 2018 emission. In addition, we aim to realize green management in all our domestic business sites.

Every year, Hyosung establishes and operates facility investment plans for saving energy. In 2021, In 2021, all relevant departments, including planning, research, production and power management established mid- to long-term GHG reduction plans to achieve the 2030 reduction goal, and the top management and the board of directors approved it.. In the case of a reduction target that is difficult to achieve through internal energy saving efforts, we plan to implement the target over the long term through the purchase of renewable energy certificates from domestic third-party PPAs, as well as the purchase of green electricity, and to gradually increase our proportion of renewable energy use.

In April 2021, Hyosung expanded and restructured its existing Transparent Management Committee, which was in charge of governance sector in the BOD, into the ESG Management Committee, which integrates the environmental and social sectors. This committee discusses and decides on ESG-related policies, targets, risk management, investments, and action plans, and also covers climate change-related issues. Hyosung's Board of Directors (ESG Management Committee) is chaired by the former Minister of Environment, a climate change expert. In 2021, the Board of Directors dealt with a variety of issues, such as modifying the Green Management Vision 2030 policy, setting reduction targets, introducing internal carbon pricing, and excessive and shortage carbon credits in accordance with the emission trading system.

In addition, since April 2021, the existing EHS (Environment, Health, Safety) Committee and CSR Committee were integrated and expanded into the ESG Management Promotion Committee under the CEO to promote not only the environment, safety, and health, but to also address issues in Social Responsibility and Governance. The ESG Management Promotion Committee is held once a quarter to select major issues to be presented or reported to the BOD. The R&D Committee consists of the CEO and management representatives and is convened once every half year to establish R&D strategies based on the opinions of related departments such as sales, marketing, product development, and research.

As a dedicated organization, Hyosung has the ESG Management Department under the direct control of CEO and the Green Management Team under the Strategy Headquarter to establish climate change strategies, manage implementation, and disclose performance. Onsite power management teams and production departments are charged with reducing energy usage and GHG emissions.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1 2021	December 31 2021	No	<Not Applicable>

C0.3

(C0.3) Select the countries/areas in which you operate.

Republic of Korea

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

KRW

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Operational control

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	KR7004800009

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board Chair	In April 2021, Hyosung expanded and restructured its existing Transparent Management Committee, which was in charge of governance sector in the BOD, into the ESG Management Committee, which integrates the environmental and social sectors. This committee discusses and decides on ESG-related policies, targets, risk management, investments, and action plans, and also covers climate change-related issues. Hyosung's Board of Directors (ESG Management Committee) is chaired by the former Minister of Environment, a climate change expert. Hyosung is not only obligated to the emission trading system, which is the national greenhouse gas regulation, but also needs to reduce greenhouse gases through continuous energy efficiency improvement and technology development in order to meet customers' requests to respond to climate change. Short-term, medium-term, and long-term plans such as investment and business expansion according to technology development are also related to financial planning. Climate change-related issues collected by business divisions are reviewed by the ESG Management Promotion Committee, and the Board of Directors (ESG Management Committee) makes final decisions on matters that need to be reflected in management plans, such as investments. In 2021, the BOD addressed a variety of agendas, such as revision of the Green Management Vision 2030 policy and setting reduction targets, introduction of internal carbon prices, and excess and shortage of carbon credits according to the emission trading system.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – all meetings	Reviewing and guiding strategy Reviewing and guiding risk management policies Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<Not Applicable>	The board of directors is regularly held every quarter and runs whenever needed if the agenda need to be discussed. It reviews and approves (or denies) important agendas like the following: Hyosung's ESG management vision, business strategies, business plans, and budget and investment plans. ESG Management Committee under the BOD was held six times in 2021. In 2021, the ESG Management Committee under the board of directors reviewed and approved the following major management plans. - Green Management Vision 2030 Policy revision and reduction target setting - Resolution to introduce internal carbon price - Company-wide risk management plans including non-financial risks such as climate change - Excess and shortage of carbon credits according to the emission trading system - Approval of setting and evaluation of ESG performance indicators (KPI) for employees including climate change - Review of major eco-friendly products and businesses of Hyosung Group - Environmental investment performance in 2021 and plan for 2022 including response to climate change such as establishment of a product carbon footprint calculation system - Participation in CDP

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	The board of directors consists of experts in various fields such as society, economy, finance, law, technology, environment, etc. as outside directors. Among them, one of the members of the ESG Management Committee is an expert in environment and technology. From 2017 to the present, the former Environment Minister, an expert on climate change, has participated as a member of the board of directors ESG Management Committee and has been chairman of the board since 2021.	<Not Applicable>	<Not Applicable>

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities Since April 2021, the existing EHS (Environment, Health, Safety) Committee and CSR Committee were integrated and expanded into the ESG Management Promotion Committee under the CEO to promote not only the environment, safety, and health, but to also address issues in society and governance. The ESG Management Promotion Committee is held once a quarter to select major issues to be presented or reported to the BOD. The R&D Committee consists of the CEO and management representatives and is convened once every half year to establish R&D strategies based on the opinions of related departments such as sales, marketing, product development, and research.	<Not Applicable>	Quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

Since July 2021, the existing EHS (Environment, Health, Safety) Committee and CSR Committee were integrated and expanded into the ESG Management Promotion Committee under the CEO to promote not only the environment, safety, and health, but to also address issues in society and governance. The ESG Management Promotion Committee is held once a quarter to select major issues to be presented or reported to the BOD. The R&D Committee consists of the CEO and management representatives and is convened once every half year to establish R&D strategies based on the opinions of related departments such as sales, marketing, product development, and research.

The dedicated organization consists of the ESG Management Department under the CEO and the Green Management Team under the Strategy Division, and is responsible for establishing climate change strategies, managing implementation, and disclosing performance. Onsite power environment teams and production departments are charged with reducing energy usage and GHG emissions.

The purchasing part of the management team establishes supply chain management strategies such as green purchases and manages risks, and the environmental safety team manages safety risks including preparation for climate change such as typhoons and heavy rains, and the compliance support team manages and responds to related regulatory risks.

In 2021, Hyosung ESG Management Promotion Committee made the final decision on the investment budget of KRW 1,827 million in the environmental sector.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	Hyosung established KPI (Key Performance Index) which is based on quantitative evaluation items from ESG R&R in each team. When setting items, as the requirements it should reflect climate change responses inside and outside, management of GHG emissions and reduction, management of energy consumption and reduction, and so on. The accomplishment is assessed in each item and affects the monetary incentives provided to board members and persons in charge of environmental matters.

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity incentivized	Comment
Board/Executive board	Monetary reward	Emissions reduction target Energy reduction project Behavior change related indicator Environmental criteria included in purchases Supply chain engagement Company performance against a climate-related sustainability index	Every year, directors are evaluated for expertise related to the company's business and technology, and whether or not to perform board activities. Registered directors comprehensively evaluate quantitative indicators consisting of sales, operating profit, and net profit and non-metric indicators consisting of company contributions (ESG management such as climate change response and global management). Compensation approved at the general shareholders' meeting based on the evaluation results shall be paid within the remuneration limit of the director.
Other C-Suite Officer	Monetary reward	Energy reduction target	Research on the improvement of energy efficiency is included in the KPIs of the CTO(Chief Technology Officer) who is in charge with overall research for product development, and monetary incentives are provided through salary based on the achievement of KPIs.
Management group	Monetary reward	Energy reduction target	Energy saving is included in the KPIs of domestic plant managers, and monetary incentives are provided through salary based on the achievement of KPIs.
Environment/Sustainability manager	Monetary reward	Emissions reduction target	Based on the mid-term GHGs reduction plan, emission reduction target is established. The yearly emission reduction target is included in the KPIs of the Green Management Team as well as the individuals (i.e. managers)and the monetary incentives are provided through salary based on the achievement of KPIs.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	1	3	Hyosung considers 1–3 years as 'short-term'.
Medium-term	3	5	Hyosung considers 3–5 years as 'medium-term'.
Long-term	5	10	Hyosung considers 5–10 years as 'long-term'.

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

Hyosung grants responsibility and authority for all its business matters including climate change response depending on their financial impact and the utilization of opportunities in accordance to its "decision-making-delegation regulations". Annual budget including physical and transition risks and opportunities caused by climate change is planned every year, and Investment Review Subcommittees or the Investment Review Committee are regularly held for activities that require a certain amount or more of budget. If the investment is more than KRW 1 billion for investments already included in the budget, or it is more than KRW 500 million for those that are not included in the budget, the CEO or the higher-level authority is responsible to make the investment decision. Hyosung defines business matters that have a financial impact equal to or greater than KRW 500 million as a significant financial risk. Such projects and business matters are defined "significant" and requires the highest-level of decision-making according to internal regulations. This applies equivalently to all projects including climate change.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations
Upstream
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

More than once a year

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

Hyosung defines 'risks' mean all market uncertainty, domestic and foreign risks, and opportunities that are likely to affect seriously management activities. Considering that ESG issues including climate change are important, Hyosung integrates them into the company-wide risk management process and operates and manages them together. It revised the relevant process regulations to enhance the capability for the company-wide risk management in the reporting year. The ESG management team (a working body) was restructured for systematic risk management and made the ESG Management Committee under the CEO to manage the company-widely integrated risks. Risks are divided into 'financial risk' and 'non-financial risk (business continuity, management)'. Considering risk impacts and possibilities, the main risks are judged and defined. Financial risk measurement, evaluation and hedging are carried out periodically through cooperation with domestic and foreign subsidiaries under the supervision of the Finance Headquarter. As for non-financial risks, the ESG management team directly under the CEO, Strategic Headquarter, and Support manage company-wide risks, and the head of PU(Performance Unit) and plant manager operates a working-level organization to respond to risks related to the environment and safety of the workplace. The process for identifying, evaluating, and responding to company-widely possible risks including climate change issues is as follows. (Risk Identification) Identify internal and external status through internal and external stakeholder requirements survey → Identify risks through SWOT and 3C analysis for each identified issue (Risk assessment) Assess the materiality of each risk by considering the probability and timing of occurrence of each identified risk and the size (severity) of financial and non-financial impacts (Risk responses) Prepare response measures for each risk and carry out response activities (evaluate whether the target of the response plan has been achieved for major risks) Items identified as major risks in the process are reported to the top management/board of directors, and decisions related to risk management and response by the CEO/board are shared and applied throughout the company through the ESG management team. Items not judged as major risks are managed through continuous monitoring. The risk status is updated and managed every year, and the data is reflected in the decision-making process of the ESG Management Committee (BOD) on climate change issues. The risks are managed not only in directly managed workplaces but also in the whole value chain. Upstream risks in the value chain are considered important impacts because they are directly linked to purchasing raw materials and direct operation. Hyosung established code of conduct for suppliers and ESG evaluation standards for all suppliers that do business with Hyosung, the company identifies and systematically manages risks across the business, including climate change. Hyosung has established an emergency response system equipped with an emergency organization and detailed response guidelines for each case in preparation for difficulties in supply due to unexpected accidents or issues of business partners, including physical risks such as typhoons and heavy rains. In addition to basic response manuals such as natural disasters, human disasters, and safety accidents, the company defines the situation in case of a supply emergency, and establishes and operates an emergency response system for each scenario. Hyosung is advancing the level of joint response through participation in government-funded projects related to climate change response in partnership with suppliers and performance assessments of such projects. Since 2016, Hyosung has been conducting consulting with suppliers to save energy and funding investments in energy efficiency facilities. As Hyosung is a B2B company that produces intermediate goods rather than final products, downstream issues such as customers and end consumers are important. Therefore, it is possible to create new business opportunities by analyzing customer risks and developing products and technologies that can mitigate them, so the company is actively managing them. Hyosung identifies and collect market trends and customer needs such as demands for use of eco-friendly materials, low-carbon product development through its C-Cube system, which compiles VOC(Voice of Customer), VOCC(Voice of Customer's Customer) and VOCO(Voice of Competitor) so that we can reflect customers' voice and opinions to overall business sectors including sales, marketing, quality and R&D. C-Cube activities consist of 5 steps which are data collection, analysis, sharing, action, and result management. The C-Cube is systemized so that all collected information (i.e. customer opinions, market change) can be retrieved spontaneously by the relevant departments. In particular, the continuous rise in average temperature due to climate change as well as the changes in consumer behavior, has resulted in our customers' demand for eco-friendly materials usage, emissions reduction, low-carbon product development as well as the disclosure of information related to climate change. Hyosung responds by considering the requirements of major customers as a top priority, and continuously conducts eco-friendly research and development and provides carbon information to customers. Since 2011, Hyosung have established our own greenhouse gas management system CAMS (carbon asset management system) and have been managing overall greenhouse gas emissions reporting, emission management and reduction activities, and purchase of emission rights after external verification of greenhouse gases. In addition, Hyosung have upgraded CAMS to enable the calculation of product carbon footprint in 2022. Also, Hyosung have been voluntarily responding to CDP Supply Chain since 2010, respectively, participating in CDP, and are publishing sustainability report every year.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	[Emissions trading scheme] Hyosung has been participating in Korea ETS since 2015 and is subject to mandatory reporting of its GHGs emissions each year. After the spin-off in 2018, emissions of the previous year of Hyosung have been separated from the group-level and was then reported to the government. Hyosung is managing allowances according to the allocations of the third ETS planning phase (2021-2025). Green management policy of Hyosung considers GHGs regulation and emissions reduction as top priority. Complying with the government's GHGs regulations, we have reported the emissions after external verification, managed allowances, implanted reduction activities and purchased emissions allowances accordingly. And the operation costs of such management are included in our annual budget. The government has established allocation criteria for the third ETS planning phase (2021-2025) and requires continued reduction of GHGs in the industrial sector. As the management over GHGs regulations is intensifies, the operating costs will increase, which will be a financial risk for Hyosung. To minimize risks from the ETS system, Hyosung calculated expected emissions during the third ETS planning phase and analyzed the surplus or deficient amount each year and the financial impacts thereof. In the pursuit of continuous emissions reduction and response to the regulations, the company is discovering and implementing various internal and external reduction activities, while applying for additional emissions allowances if necessary, in accordance with the requirements for changes in our production sites. Hyosung has been acquiring carbon credit through the CDM project from 2011 to 2021. In order to continuously reduce greenhouse gases, the Company invested KRW 652 million in the 2021 budget to introduce high-efficiency facilities and reduce energy by improving environmental facilities. In 2022, the board of directors finally approved an investment plan of about KRW 843 million to continue energy saving activities.
Emerging regulation	Relevant, always included	[Carbon Border Adjustment Mechanism (CBAM)] As problems due to climate change come true, environmental regulations, particularly related to climate change, are increasingly stricter around the globe and each country makes much effort to reduce GHG emissions. Many regulations are strengthened accordingly. It seems that the trend would affect Hyosung directly so that it assesses the impacts by including the impacts in the company-wide risk assessment process. In July 2021, the European Commission introduced its proposal for an EU 'Carbon Border Adjustment Mechanism (CBAM)', which would impose a carbon levy on imports for the target of a 55% reduction by 2030. It will start from the trial introduction in 2023 and settle down to the levy from 2026. It is, therefore, expected that the carbon border levy would affect directly exports of Hyosung, a global company. Hyosung's ESG Management and Planning Team judged the EU CBAM as a risk, it analyzed its impacts on each Performance Unit. As the results of risk analysis, it expects that EU client companies would apply pressure to lower the unit cost to pass on purchasing costs of certifications. It is also expected to increase transportation costs due to the growing demand for carbon emission certifications and to decline in export. It made countermeasures (enhancement of the internal carbon assets system and introduction of GHG reduction system) to minimize the relevant risk. It introduced the internal carbon price through the internal carbon assets system and established criteria for economic evaluation. In particular, it made development plans of CO2 management modules in the entire process for Hyosung's products to respond to carbon border levy and invested about KRW 84.5 million in the system construction to respond to the demand for information disclosure on carbon emissions from products through system upgrade in 2022.
Technology	Relevant, always included	The customers' demands for eco-friendly products and materials globally increase and the attention to eco-friendly and value-centered consumption grows. In order to cope with the market change and to meet customers' needs, Hyosung needs to change its products into eco-friendly ones through continuous R&D. As global clothing and shoe manufacturers have actively expanded the use of eco-friendly materials, Hyosung has developed high-strength recycled polyester yarn which is made of raw materials extracted from waste plastics. After securing the required properties by using recycled polyester chips, we have obtained Global Recycle Standard (GRS) certification and is working on commercialization technology development. Hyosung developed bio-based spandex by polymerizing bio material from fermented corns. We plan to apply it to various products incl. yoga wear and swimsuit. Hyosung is developing yarns with biodegradation rate higher than 80% from a PET biodegradable chip. Hyosung is plan to develop a technology to manufacture Bio-PET fiber by polymerizing and spinning Bio-EG, which is based on fermented sugar cane, in order to apply it to various uses incl. tire cords and automotive carpets. Also, conducting research on high-strength carbon fibers applicable to high-pressure containers used in hydrogen vehicles and composite materials to shorten molding cycle. As eco-friendly equipment is biodegradable and can reduce hazardous substance, the market demand increases. Hyosung research centers is leading the development of eco-friendly products such as transformers and breaks replacing equipment's insulators with eco-friendly materials. An eco-friendly transformer copes with it by developing transformers using ester oil instead of the existing mineral oil. The ester oil is eco-friendly and biodegradable. Hyosung continuously promotes R&D for stability and performance improvement. And an eco-friendly gas insulated switchgear responses to it by developing breakers to replace the existing SF6 gas(23,900kgCO2eq/kgSF6) with Novec Mixture gas(about 500kgCO2eq/kgNovec Mixture gas). Hyosung invested about KRW 19,435 billion as R&D in 2021.
Legal	Relevant, always included	All types of lawsuits associated to climate change can lead to sales loss due to negative reputations as well as direct financial loss. Regarding major projects of Hyosung, risks are identified and evaluated in advance according to internal investment review procedures, and the Legal Compliance Team who conducts legal reviews if necessary. The GHG ETS (Emissions Trading System) has been implemented according to 'the Act on the Allocation and Trading of Greenhouse-Gas Emissions Permits (hereinafter referred to 'ETS Act')'. Hyosung is a company subject to emissions allocations within the KoreanETS system and has an obligation to report carbon emissions every year. A fine of more than KRW 10 million will be imposed depending on each case if the emissions report is omitted or problematic, (Article 43 of the ETS Act) and a fine of up to three times the average market price of the emission allowances in the year of implementation may be imposed (within the range of KRW 100,000 per ton of CO2) to allowances in shortage through the settlement. (Article 33 of the ETS Act). In addition, for all climate change-related lawsuits, decision-making responsibilities and authorization are imposed in accordance to the internal decision-making delegation regulations. In particular, for cases that cost more than KRW 300 million or the compensation after agreement is more than KRW 100 million, the final approval will be made at the level of the CEO or higher
Market	Relevant, always included	Changes in consumer behavior can be a major risk to the market. Following the market trend, customer companies continuously demand the use of eco-friendly materials, lightweight, emissions reduction during production process, and low-carbon products from Hyosung that produces intermediate products used for end products. Therefore, in order to specify changing market situations and needs, Hyosung does systemic management of VOC and various communication activities. Internally, a regular meeting runs to discuss VOC professionally, and it creates new demands reflecting customers' needs through this. The carbon fiber "TANSOME®," developed by Hyosung' own technology for the first time in Korea, boasts ultra-light and high-strength properties, and is four times lighter than steel but 10 times stronger. As it is used as a key material for lightening weight of cars, it contributes to reducing carbon emissions by improving fuel efficiency. TANSOME® also contributes to green energy industries such as CNG and hydrogen high-pressure containers due to its high-strength properties. To turn the hydrogen business into a new growth engine, Hyosung Group will build a value chain covering the production, transportation and charging facilities. Hyosung started to develop automotive carpet and mat using BCF (Bulk Continuous Filament) based on the needs from development teams in the client companies. We are working on developing the product which meets the customers' requirements by utilizing not only polyester recycled chips and waste nylon from waste fish nets and waste yarn, but also process wastes from both our production lines and our supplier companies for recycled chips. The new power transmission system(STACOM), developed by Hyosung, is a technology that minimizes invalid power generated by power transmission by keeping voltage constant during transmission. STACOM dramatically increases energy efficiency by more than 10 percent by applying MMC(Modular Multi-level Converter;a device that outputs the converted power close to the waveform of normal alternating current power) technology developed by Hyosung, it has implemented large and low loss performance. By doing so, it can reduce electricity production, contributing to climate change. The global STACOM market is estimated at USD 1 billion per year, and the demand for STACOM is expected to increase significantly due to the expansion of new and renewable energy and the increase in power consumption due to urbanization.
Reputation	Relevant, always included	Hyosung mostly deals with large global companies as the major customers, and they require the information disclosure on sustainability management as well as on climate change in accordance with international standards. Hyosung annually identifies the issues of increasing request for information on responses to climate change and supply of eco-friendly products and conducts response activities not to bring about negative risks on its reputation through active measures. Hyosung acquired the international GRS (Global Recycled Standard) Certification of eco-friendly products(BCF yarn, carmat). In addition, Hyosung is constructing a computer system for LCA calculation of each internal product to respond promptly to the result of each product' carbon emissions which client companies increase demand in the future. This system will be utilized in earnest from 2022. Hyosung has responded to CDP Supply Chain Program since 2010 following customers' requests. Also, Hyosung voluntarily publishes the sustainability report while participating in the CDP.
Acute physical	Relevant, always included	In Korea, the frequency of torrential rain and typhoons is increasing, especially in the summer, which can cause loss or damage to our physical assets operating in Korea. Regarding our product, 'Carpet and BCF yarn', for example, degradation of quality due to flooding can lead to additional sales loss. Hyosung conducts inspections on each business sites(including plants, R&D centers, and Heavy Industry research centers) every quarter, and implements proper countermeasures based on the inspection results. Heavy rainfall was classified as priority physical risk, and accordingly, total KRW 150.5 million (Anyang plant KRW 9.6 million and Heavy Industry research center KRW 140.9 million) was invested to mitigate this risk such as rooftop waterproofing work, and water leakage repair work. And to minimize monetary damage when damage occurs due to physical environment change, Hyosung annually renews disaster insurance.
Chronic physical	Relevant, always included	Physical changes such as an increase in average temperature and extraordinary cold weather are directly linked to heating and cooling systems of the production plants, thus resulting in a increase in operation costs. At the manufacturing plants of Hyosung, cooling or heating starts at a certain temperature in order to maintain a desirable quality of product and to operate facilities efficiently. As the heating or cooling time increases, the cost of electricity and city gas increases. Especially in the summer season, when the power supply is cut off in the area where our plant is located, extra losses may occur due to production disruptions and product defects. The annual cost of using electricity for Hyosung is KRW 2,117 million, which is 0.3 percent of total sales(KRW 1.531 trillion) , and operating costs are also expected to rise when the average temperature changes due to climate change.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Current regulation	Carbon pricing mechanisms
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Primary potential financial impact

Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

Hyosung is subject to allowances allocation as one of the participating companies of Korea ETS which is introduced and implemented to meet the target of national emissions reduction target (40% reduction compared to 2018 level), and is currently in the third phase (2021-2025) of the planning. The allowances in shortage is expected to amount to about 1,000 tons per year in Hyosung, because government designated Hyosung as a paid allocation company in the third phase (2021-2025) of the planning.

Time horizon

Medium-term

Likelihood

Virtually certain

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

10500000

Potential financial impact figure – maximum (currency)

35400000

Explanation of financial impact figure

1,000 tons of GHG is expected to be emitted each year, which can be converted to KRW 10.5–35.4 million worth financial impact. (KRW 10,500–35,350/tCO₂eq)

Cost of response to risk

467100000

Description of response and explanation of cost calculation

Hyosung submits the result of emissions assessment to the government after conducting external verification. We carry out activities such as facility replacement and energy efficiency improvement to reduce GHG emissions. - Third-party verification of emissions report in 2021: KRW 9.7 million - Emissions reduction activities in 2021: Total KRW 455 million was invested in facilities for installing high-efficiency air compressors, changing compressed air pipe lines, and reducing operating pressure of air compressors. - Maintenance for GHG emission management system in 2021 : KRW 2.4 million

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Acute physical	Other, please specify (Increased damage due to abnormal weather events such as typhoons and floods)
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Primary potential financial impact

Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

In Korea, the frequency of torrential rain and typhoons is increasing, especially in the summer, which can cause loss or damage to our physical assets operating in Korea. Regarding our product, 'Carpet and BCF yarn', for example, degradation of quality due to flooding can lead to additional sales loss.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

955000000

Potential financial impact figure – maximum (currency)

2865000000

Explanation of financial impact figure

It is difficult to predict definitely the actual financial impact because the frequency and extent of abnormal climate change due to climate change are irregular. Hyosung, however, calculated the expected damage due to operation suspension of production facilities and losses of finished products when heavy rainfall or typhoons occur. If problems such as operation suspension and distribution delay in suppliers occur, the losses are estimated at approximately 1~3% of products sales. Hyosung's product sales in 2021 are KRW 95,499 million, the estimated potential damage that may occur every year is estimated to be at least KRW 955 million to KRW 2,865 million.

Cost of response to risk

150500000

Description of response and explanation of cost calculation

Hyosung conducted a special inspection to prevent accidents due to heavy rains in Anyang plant, research center, Technical center. In 2021, Hyosung invested a total of KRW 150.5 million in response to changes of physical environment including heavy rains, power outage, and flooding. The investment includes maintenance work on the roof and waterproofing work at Anyang plant and research center.

Comment**Identifier**

Risk 3

Where in the value chain does the risk driver occur?

Downstream

Risk type & Primary climate-related risk driver

Reputation	Increased stakeholder concern or negative stakeholder feedback
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Primary potential financial impact

Decreased revenues due to reduced demand for products and services

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

Hyosung is a B2B company. In the overall business activities, it has relations with a variety of stakeholders (supply chain and clients) at home and abroad. Due to the nature of production products, the relations with client companies largely affect business sustainability so Hyosung considers win-win growth and symbiosis with client companies as important factors. Sustainability is globally asked in the whole processes in the value chain of production activities. Hyosung is relevant to an 'upstreaming' stakeholder, client companies' management object. The main client companies demand disclosing Hyosung's sustainability management (in particular, environmental management including climate change). The demand for eco-friendliness of supply products (Hyosung's products) also grows. If it cannot immediately respond to this demand and preferences from main client companies, negative reputational opinions increase and are expected to be a risk. Furthermore, Hyosung recognizes it as a critical risk to generate a direct decrease in sales such as transaction suspension and contract cancellation.

Time horizon

Medium-term

Likelihood

Virtually certain

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

1588000000

Potential financial impact figure – maximum (currency)

2077000000

Explanation of financial impact figure

If Hyosung cannot respond to the demands for disclosing information on climate change and eco-friendly products from client companies, reputational risks are expected to occur, and stakeholders' negative opinions grow. This non-financial risk is considered to be a risk to affect most largely customer churn, worsening sales, revocation of contracts, divestment, and so on. These risks may bring about financial risks such as a decline in sales and demand for eco-friendly products. It is estimated that the sales from eco-friendly product supply decrease by more than 60~80%. As the importance of responses to climate change and product eco-friendliness get higher, the amount of falling sales compared to the last year became a more important criterion. In 2021, Hyosung's sales from eco-friendly products were about KRW 2,596 million. Considering the decline in sales (60~80%) from eco-friendly product supply, as of 2021 potential financial impact was estimated at KRW 1,588 million at least and KRW 2,077 million at most.

Cost of response to risk

112900000

Description of response and explanation of cost calculation

Hyosung have been participating in the CDP Supply Chain program since 2010 upon requests of customers. It conducted consulting of making voluntary sustainability reports (finding out improvement, enhancing external assessment and response to the customer's request, collecting materials for reports, verification, and publishing). Product carbon footprint calculation system was established to respond to the customer's demand for information disclosure on the life cycle carbon emission of products. - CDP response and administration costs in 2021 : KRW 1.2 million - Making sustainability management reports and verification in 2021: KRW 18 million - ISO 14001, 45001 certification cost in 2021: KRW 5.7 million - GRS(Global Recycled Standard) certification cost in 2021: KRW 3.5 million - Establishing a product carbon footprint calculation system in 2021: KRW 84.5 million

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

Carbon fiber gains attention as hydrogen vehicle rises as the future means of mobility. Hydrogen fuel tanks should remain light while maintaining maximum 900 times of air pressure, and carbon fiber is used as the optimal material. Hyosung has developed carbon fiber, 'TANSOMEII', is four times lighter while ten times stronger than steel. As carbon fiber is used as a key material for automotive lightening, it not only contributes to reducing carbon emissions by improving fuel efficiency thanks to vehicle lightening, but it is also applied to eco-friendly energy industries such as CNG and hydrogen high-pressure containers.

Time horizon

Long-term

Likelihood

Virtually certain

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

54600000000

Potential financial impact figure – maximum (currency)

109200000000

Explanation of financial impact figure

With hydrogen cars drawing a lot of attention as eco-friendly cars in the future, the carbon fiber market is expected to grow at a high rate. According to the Fuji Keizai Management Co., Ltd.(a Japanese economy research company), the carbon fiber market is expected to increase by 2.4 times from KRW 2.1 trillion in 2019 to KRW 5.2 trillion by 2035. The production and sales of hydrogen are expected to reach to KRW 25 trillion in 2030. And as the eco-friendly vehicles attract the attention, the market for hydrogen charge is expected to show high growth and to reach to US\$ 2.5 trillion (KRW 2,949 trillion) in 2050. Hyosung Advanced Materials expects a market share of carbon fiber to be 5-10%, and sales are expected to increase by at least KRW 260 billion to up to KRW 520 billion in 2035. Therefore, Hyosung, which holds a 21% stake in Hyosung Advanced Materials, is also expected to increase its consolidated sales by at least KRW 54.6 billion to up to KRW 109.2 billion.

Cost to realize opportunity

2300000000000

Strategy to realize opportunity and explanation of cost calculation

Hyosung Group plans to invest a total of KRW 1 trillion in the carbon fiber industry by 2028 to expand its production capacity to 24,000 tons/yr. Also, to turn the hydrogen business into a new growth engine, Hyosung Group will invest a total of KRW 1.3 trillion by 2031 to build a value chain covering the production(green hydrogen plants with the capacity of 200,000 tons/yr and a liquid grey hydrogen plant with the capacity of 13,000 tons per year), transportation and charging facilities.

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Use of recycling

Primary potential financial impact

Reduced direct costs

Company-specific description

Hyosung started to develop automotive carpet and mat using BCF (Bulk Continuous Filament) based on the needs from development teams in the client companies. We are working on developing the product which meets the customers' requirements by utilizing not only polyester recycled chips and waste nylon from waste fish nets and waste yarn, but also process wastes from both our production lines and our supplier companies for recycled chips. Also, Hyosung is plan to develop a technology to manufacture Bio-PET fiber by polymerizing and spinning Bio-EG, which is based on fermented sugar cane, in order to apply it to various uses.

Time horizon

Medium-term

Likelihood

Virtually certain

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

8000000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The global market for car seats is estimated at KRW 2.7 trillion and the domestic market is estimated at KRW 200 billion. The sales of eco-friendly products continuously increase for the past 4 years. The sales rose approximately 3.7 times compared to the previous year. Based on sales of KRW 2.6 billion for eco-friendly products in 2021, sales through supplying eco-friendly products are expected to be about KRW 8 billion.

Cost to realize opportunity

1722500000

Strategy to realize opportunity and explanation of cost calculation

Hyosung continuously implements R&D of eco-friendly products to respond to increasing demands for eco-friendly products from client companies. It also acquires and maintains (renews) environment certifications. - R R&D cost of eco-friendly products related to recycled NY, PET chip and bio-PET chip in 2021: KRW 1,769 million - GRS(Global Recycled Standard) certification renewal cost in 2021: KRW 3.5 million

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Markets

Primary climate-related opportunity driver

Access to new markets

Primary potential financial impact

Increased revenues through access to new and emerging markets

Company-specific description

Major advanced countries and corporates participates in so-called Net Zero Alliance and Carbon Neutrality Alliance in order to respond to global climate change crisis. It is also expected that the ESS market grows speedily through the systematic linkage of various renewable power sources by trends of energy conversion and the enhancement of carbon neutrality alliance and the reinforcement of electrical grid stability by the expansion of small distributed power. Hyosung Group is also actively responding to market changes caused by the climate crisis in line with this market trend. we have not only strengthened its position as the No. 1 company in the domestic market share of existing UHV and circuit breakers, but has also been continuously pushing for development of ESS since 2013. As the leading ESS company, it supplies versatile ESS like the following: linkage of new renewable energy, amplitude modulation, peak power reduction and independent microgrid. ESS of Hyosung group consists of ES PCS with high efficiency and high reliability, PMS applicable to various applications, and batteries with the optimal capacity and performance and provides customized ESS consulting and system construction. It also provides solutions through the self-produced Stacom (Static Synchronous Compensator) and solution provider, a new renewable power system using ELSS.

Time horizon

Medium-term

Likelihood

Virtually certain

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

2170000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The European ESS market is expected to grow by more than 50% every year to a total of KRW 720 billion as of last year, while the British and German ESS markets account for 60% of the European market. In particular, the UK is expected to implement a policy aimed at zero carbon emissions by 2050, further increasing renewable energy generation and ESS supply. Hyosung Heavy Industries won an order for KRW 18 billion to build a 50MW ESS in Southampton, England in September 2020, and began operation in August 2021 to enter the ESS European market in earnest. Accordingly, if Hyosung Heavy Industries applies the expected growth rate of 50%/yr in the European ESS market based on the KRW18 billion this time, we expect sales to increase by KRW 27 billion in 2022. Hyosung Heavy Industries is carrying out ESS business not only in Europe but also in the U.S. market. According to Wood Mackenzie, the size of the U.S. ESS market in 2021 was \$5.5 billion, more than tripled from 2020. Hyosung Heavy Industries achieved KRW 13.6 billion in sales in 2019, including delivery of 10MW ESS to the U.S. market, and assuming that the U.S. ESS market has grown at least three times in 2021, sales of KRW 40.8 billion are expected compared to 2019. As a result, Hyosung Heavy Industries is expected to increase its sales by a total of KRW 67,800,000,000 (KRW 27 billion + KRW 40.8 billion) due to its entry into the European and U.S. ESS markets. Therefore, Hyosung, which holds a 32% stake in Hyosung Heavy Industries, is also expected to increase consolidated sales by KRW 21.7 billion (KRW 67.8 billion x 32%).

Cost to realize opportunity

5314000000

Strategy to realize opportunity and explanation of cost calculation

Hyosung is continuously conducting research and development to improve the quality of ESS services and continue to export to the U.S. and Europe markets and conducted ESS R&D for one year in 2021 such as "development and demonstration to PNNL hybrid ESS in North America." - R&D Cost for ESS in 2021: KRW 5,314,000,000

Comment

C3. Business Strategy

C3.1

(C3.1) Does your organization’s strategy include a transition plan that aligns with a 1.5°C world?

Row 1

Transition plan

No, but our strategy has been influenced by climate-related risks and opportunities, and we are developing a transition plan within two years

Publicly available transition plan

<Not Applicable>

Mechanism by which feedback is collected from shareholders on your transition plan

<Not Applicable>

Description of feedback mechanism

<Not Applicable>

Frequency of feedback collection

<Not Applicable>

Attach any relevant documents which detail your transition plan (optional)

<Not Applicable>

Explain why your organization does not have a transition plan that aligns with a 1.5°C world and any plans to develop one in the future

Hyosung promotes Green Management and EGS Management including climate change and also recognized the importance. Therefore, it implements risk and opportunity analysis of climate change and plans management strategy reflecting the results. Based on the reporting year, a conversion plan to comply with 1.5°C scenario is not established yet, but Hyosung is establishing the conversion plan reflecting the relevant information in the next 2 years.

Explain why climate-related risks and opportunities have not influenced your strategy

<Not Applicable>

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative, but we plan to add quantitative in the next two years	<Not Applicable>	<Not Applicable>

C3.2a

(C3.2a) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenario		Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios	Customized publicly available transition scenario	Company-wide	1.6°C – 2°C	[Parameters] Hyosung established a reduction target by calculating the expected emissions and reductions at the workplace. The consumption of fuel such as LNG, gasoline, and diesel and the consumption of indirect energy such as externally purchased electricity and steam are correlated with greenhouse gas emissions. Therefore, the expected emissions were calculated using the expected product production and energy consumption. [Assumptions] The automobile carpet business, which is Hyosung’s business area, is expected to grow together with the growth of the automobile market, which is expected to cause a shortage of emission permits. [Analytical choices] Recently, the South Korean government has enacted the ETS Act on Carbon Neutrality and Green Growth, and revised the Nationally Determined Contribution (NDC) for transitioning to a carbon-neutral society. To meet our industry-specific goal with respect to South Korea’s Nationally Determined Contribution (NDC), Hyosung have updated our quantitative GHG reduction target within our Green Management Vision 2030 to achieve 14.5% of reduction relative to BAU in 2018 (from the existing 20.5% reduction target relative to BAU in 2017), based on our GHG emissions reduction performance in 2017. In addition, we aim to realize green management in all our domestic business sites. Every year, Hyosung establishes and operates facility investment plans for saving energy. In 2021, mid- to long-term reduction measures to achieve the 2030 reduction target were established by all related departments, including the departments for planning, research, production, and power, and reported to the management and the Board of Directors. In the case of a reduction target that is difficult to achieve through internal energy saving efforts, we plan to implement the target over the long term through the purchase of renewable energy certificates from domestic third-party PPAs, as well as the purchase of green electricity, and to gradually increase our proportion of renewable energy use. On the other hand, through the development of low-carbon products as well as the development of recycled materials, we intend to contribute to the emissions reduction in overall industry. Hyosung Group plans to invest a total of KRW 2 trillion in the carbon fiber industry and hydrogen business into a new growth engine. And commercialization of R&D is underway.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

[Focal Issues that have directed the analysis of climate change scenarios] In line with the international community’s response to climate change, the Korean government first announced “2050 Carbon Neutral” in October 2020, and later declared the “2050 Carbon Neutral Vision” in December 2020. Since then, in December 2021, the government has submitted Korea’s raised “2030 National Greenhouse Gas Reduction Goals (NDC)” to the secretariat of the United Nations Framework Convention on Climate Change. Regarding the establishment of the government’s greenhouse gas reduction target, the government-operated K-ETS(Emissions Trading Scheme) is expected to be able to directly link to the 2050 carbon neutral target and be an effective means of implementation in achieving the national greenhouse gas reduction target. Accordingly, Hyosung has established a 2030 greenhouse gas reduction target (a 14.5% reduction in greenhouse gas reduction by 2030 compared to 2018) to respond to the 2030 greenhouse gas reduction target and K-ETS. [Reasons for scenario selection to address focal questions] Hyosung is obligated to report emissions every year as it has been incorporated as a company subject to the allocation of the K-ETS since 2015. However, in the emission trading scheme, if Hyosung emits more greenhouse gas emissions than the allocated emission allowances every year, there is a cost risk of purchasing emission rights for the shortfall. The government is concerned to continuously increase the paid allocation ratio (3% for the second commitment period and 10% for the third commitment period) to achieve the raised national NDC target (14.5% reduction in 2030 compared to 2018). Therefore, it is expected that Hyosung will need to solve the problem of insufficient emission permits by achieving the greenhouse gas reduction target through low-carbon product development, etc. as it establishes a reduction target in line with the national NDC goal.

Results of the climate-related scenario analysis with respect to the focal questions

Hyosung has been obligated to report and reduce emissions as a company subject to the allocation of Korea ETS since 2015. Hyosung is subject to allowances allocation as one of the participating companies of Korea ETS which is introduced and implemented to meet the target of national emissions reduction target (40% reduction compared to 2018 level), and is currently in the third phase (2021-2025) of the planning. The automobile carpet business, which is Hyosung’s business area, is expected to grow together with the growth of the automobile market, which is expected to cause a shortage of emission permits. The allowances in shortage is expected to amount to about 1,000 tons per year in Hyosung, because government designated Hyosung as a paid allocation company in the third phase (2021-2025) of the planning. 1,000 tons of GHG is expected to be emitted each year, which can be converted to KRW 10.5~35.4 million worth financial impact. (KRW 10,500~35,350/tCO2eq) Therefore, Hyosung has established an internal greenhouse gas reduction target that is at the level of the national NDC target and is carrying out greenhouse gas reduction activities to achieve a 14.5% reduction compared to 2018 by 2030 and plans to continue its activities in the future.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Carbon fiber considered as one of the new growth engines of Hyosung is gaining the reputation as a key material in eco-friendly mobility(i.e. application for pressure tank reinforcements in hydrogen vehicles) since it can be applied to any product which uses steel. With hydrogen cars drawing a lot of attention as eco-friendly cars in the future, the carbon fiber market is expected to grow at a high rate to the size of USD 10 billion (KRW 12 trillion) by 2030. Hyosung Group plans to invest a total of KRW 1 trillion in the carbon fiber industry by 2028 to expand its production capacity from 2,000 tons/yr to 24,000 tons/yr. Also, to turn the hydrogen business into a new growth engine, Hyosung Group will invest a total of KRW 1.3 trillion by 2031 to build a value chain covering the production(green hydrogen plants with the capacity of 200,000 tons/yr and a liquid grey hydrogen plant with the capacity of 13,000 tons per year), transportation and charging facilities.
Supply chain and/or value chain	Yes	Hyosung is an intermediate material company whose major production products, and needs joint risk management with customers who sell raw and subsidiary materials as final products. Hyosung operate and manage sharing goal of cooperate partnership and promotion system to maintain supply chain. And they operate and manage programs to support facilities for energy reduction, to run jointly energy partnership, to establish behavior rules for suppliers, etcetera. - Business for large and small energy partnership: Hyosung concluded business agreement of shared growth for large and small companies with Korea Energy Agency and provided suppliers with consulting for energy diagnosis for energy reduction in suppliers and GHG emissions reduction. - Establishment of behavior rules for the suppliers: From the supplier selection phase to management, Hyosung regularly reflected the criteria which includes not only quality, price, management performance but also environment, safety, legal requirements in evaluation items to establish behavior rules. Because the later criteria could be risks related to climate change. Hyosung annually inspects the management of energy use and implementation of reduction activities through diagnosis of social responsibility management of business partners and gives additional points for evaluation through due diligence. Inspection, guidance, carbon certification of products, and disclosure of climate change information for business partners are reflected in the work and budget of related departments every year. CDP Supply Chain has been responding since 2010 among the information disclosure related to climate change requested by customers. As part of green management, it expands the footprint calculation of major product by 2030. In addition, from 2020, for sustainable development, ESG information disclosure has been voluntarily conducted by receiving ESG evaluation from the Korea Corporate Governance Service (KCGS). We actively respond to customers' requests for disclosure of ESG information, and are strengthening communication with stakeholders about improvements such as disclosure information and disclosure methods. We obtained an A grade in the Korea Corporate Governance Service (KCGS) '2021 ESG Evaluation of Listed Companies'.
Investment in R&D	Yes	Hyosung continues to carry out R&D in order to secure new growth engines and strengthen capabilities of the existing projects. R&D Committee discuss the R&D status of major items of each business company and reflect customers' requirements including climate change issues in R&D strategies in timely manner. The customers' demands for eco-friendly products and materials globally increase and the attention to eco-friendly and value-centered consumption grows. In order to cope with the market change and to meet customers' needs, Hyosung needs to change its products into eco-friendly ones through continuous R&D. Hyosung has developed high-strength recycled polyester yarn which is made of raw materials extracted from waste plastics. After securing the required properties by using recycled polyester chips, we have obtained Global Recycle Standard (GRS) certification and is working on commercialization technology development. Hyosung developed bio-based spandex by polymerizing bio material from fermented corns. We plan to apply it to various products incl. yoga wear and swimsuit. Hyosung is developing yarns with biodegradation rate higher than 80% from a PET biodegradable chip. Hyosung is plan to develop a technology to manufacture Bio-PET fiber by polymerizing and spinning Bio-EG, which is based on fermented sugar cane, in order to apply it to various uses incl. tire cords and automotive carpets. Also, conducting research on high-strength carbon fibers applicable to high-pressure containers used in hydrogen vehicles and composite materials to shorten molding cycle. As eco-friendly equipment is biodegradable and can reduce hazardous substance, the market demand increases. Hyosung research centers is leading the development of eco-friendly products such as transformers and breaks replacing equipment's insulators with eco-friendly materials. An eco-friendly transformer copes with it by developing transformers using ester oil instead of the existing mineral oil. The ester oil is eco-friendly and biodegradable. Hyosung continuously promotes R&D for stability and performance improvement. And an eco-friendly gas insulated switchgear responses to it by developing breakers to replace the existing SF6 gas(23,900kgCO2e/kgSF6) with Novec Mixture gas(about 500kgCO2e/kgNovec Mixture gas). Hyosung invested about KRW 19,435 billion as R&D in 2021.
Operations	Yes	Hyosung has been responding to the government's GHG regulations by reporting emissions and submitting monitoring plans every year. The emissions report is verified by third party agency before being submitted to the government. Moreover, we also plan a budget for emissions reduction and energy efficiency investment every year to fulfill the obligation to reduce GHG. Against the total emissions of Hyosung, emissions from electricity use account for 69.8%, and the company is carrying out activities to reduce power use. Each year, more than KRW 10 million is spent on verification on emissions alone, and in 2021, a total of KRW 455 million was invested in installing high-efficiency air compressors, changing compressed air pipe lines, and reducing operating pressure of air compressors.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Indirect costs Capital expenditures Capital allocation Acquisitions and divestments Access to capital Assets Liabilities	[Revenues] The sales of eco-friendly products continuously increase for the past 4 years. The sales rose approximately 3.7 times compared to the previous year. Based on sales of KRW 2.6 billion for eco-friendly products in 2021, sales through supplying eco-friendly products are expected to be about KRW 8 billion. Hyosung Group plans to invest KRW 2.3 trillion in the carbon fiber and hydrogen business, which is a low-carbon product, and expects sales of the product to increase significantly. [Direct costs] Expenses of purchasing emission credits and emission reduction activities are included in the investment plan of Hyosung, and the annual budget is updated every year to meet the emissions reduction. [Indirect costs] Of the indirect costs for production in Hyosung, energy costs are KRW 3,078 million, accounting for 0.6% of the total operating costs. Due to climate change, heat waves and cold waves are increasing, and temperatures in domestic businesses sites are managed within a certain range for the sake of product quality in the production process, which can lead to increases in air-conditioning or heating costs. Hyosung ensures that power consumption amount does not exceed a certain limit in preparation for power peak policy implemented in Korea. Moreover, we also include energy costs from heat wave and cold wave in the financial plan and annual budget. [Capital expenditures/Capital allocation] Hyosung Group plans to invest a total of KRW 1 trillion in the carbon fiber industry by 2028 to expand its production capacity from 2,000 tons/yr to 24,000 tons/yr. Also, to turn the hydrogen business into a new growth engine, Hyosung Group will invest a total of KRW 1.3 trillion by 2031 to build a value chain covering the production(green hydrogen plants with the capacity of 200,000 tons/yr and a liquid grey hydrogen plant with the capacity of 13,000 tons per year), transportation and charging facilities [Acquisitions and divestments] Hyosung was divided into the operating holding company, Hyosung Corporation(Hereafter Hyosung), which is in charge of group-wide investment plans and management of subsidiaries' stakes, and for companies- Hyosung TNC Corp., Hyosung Heavy Industries Corp., Hyosung Corp. and Hyosung Chemical Corp., whose business area covers textile•trading, heavy industries•construction, industrial materials and chemicals, respectively. Hyosung merged with Hyosung Transworld Co., Ltd. on January 29, 2021. And, currently, there is no plans to acquire or sell it. If the acquisition or sale takes place in the future, risks and opportunities regarding climate change will be reviewed from the initial stage. Decisions on the important investment and sale of the company will be made in the Board of Directors. [Access to capital] If Hyosung has a problem with reporting emissions in the emission trading scheme or is passive in working on meeting the emissions reduction target, it can negatively affect corporate value due to reputation risks. In such cases, the company may experience difficulties in raising fund for future investments in climate change. However, the probability is expected to be very small. There have been no finance plans for risk response or opportunity utilization related to climate change so far, and the plans will be established if necessary. [Assets] Hyosung is reducing emissions through facility replacement and energy efficiency projects every year, and the necessary financial resources are reflected in the annual budget of Anyang plant, technical centers and research centers. In 2021, a total of KRW 455 million was invested in installing high-efficiency air compressors, changing compressed air pipe lines, and reducing operating pressure of air compressors. [Liabilities] Active R&D drive to secure future growth engines as well as facility expansion in Hyosung may cost large-scale investment, and the company debt may increase or decrease depending on the implementation of the investment plan.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Absolute target

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1

Year target was set

2021

Target coverage

Company-wide

Scope(s)

Scope 1

Scope 2

Scope 2 accounting method

Location-based

Scope 3 category(ies)

<Not Applicable>

Base year

2018

Base year Scope 1 emissions covered by target (metric tons CO2e)

10942

Base year Scope 2 emissions covered by target (metric tons CO2e)

24129

Base year Scope 3 emissions covered by target (metric tons CO2e)

<Not Applicable>

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)

35071

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1

100

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2

100

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)

<Not Applicable>

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes

100

Target year

2030

Targeted reduction from base year (%)

14.5

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]

29985.705

Scope 1 emissions in reporting year covered by target (metric tons CO2e)

9766

Scope 2 emissions in reporting year covered by target (metric tons CO2e)

23601

Scope 3 emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)

33367

% of target achieved relative to base year [auto-calculated]

33.5083805364291

Target status in reporting year

Revised

Is this a science-based target?

No, but we anticipate setting one in the next 2 years

Target ambition

<Not Applicable>

Please explain target coverage and identify any exclusions

Hyosung set a target to reduce 14.5 % of GHG emission by 2030 compared to 2018 at all domestic sites.

Plan for achieving target, and progress made to the end of the reporting year

Hyosung updated the GHG quantitative target from 20.5% reduction compared to 2017 emission to 14.5% reduction compared to 2018 emission in order to meet the industrial sector target of the National Greenhouse Gas Reduction Target (NDC) announced in 2021. Every year, Hyosung establishes and operates facility investment plans for saving energy. In 2021, mid- to long-term reduction measures to achieve the 2030 reduction target were established by all related departments, including the departments for planning, research, production, and power, and reported to the management and the Board of Directors. In the case of a reduction target that is difficult to achieve through internal energy saving efforts, we plan to implement the target over the long term through the purchase of renewable energy certificates from domestic third-party PPAs, as well as the purchase of green electricity, and to gradually increase our proportion of renewable energy use. Hyosung changed the compressed air piping line and reduced the operating pressure of the air compressor to reduce greenhouse gas by 1,549tCO₂e in 2021 at the Anyang plant.

List the emissions reduction initiatives which contributed most to achieving this target

<Not Applicable>

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

No other climate-related targets

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO₂e savings.

	Number of initiatives	Total estimated annual CO ₂ e savings in metric tonnes CO ₂ e (only for rows marked *)
Under investigation	0	0
To be implemented*	0	0
Implementation commenced*	2	1549
Implemented*	0	0
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Energy efficiency in production processes	Machine/equipment replacement
---	-------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

1199

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

327600000

Investment required (unit currency – as specified in C0.4)

350000000

Payback period

1-3 years

Estimated lifetime of the initiative

11-15 years

Comment

Hyosung plans to reduce power by replacing the existing air compressor at Anyang plant with a high-efficiency air compressor.

Initiative category & Initiative type

Energy efficiency in production processes	Process optimization
---	----------------------

Estimated annual CO2e savings (metric tonnes CO2e)

350

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 2 (location-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

95500000

Investment required (unit currency – as specified in C0.4)

105000000

Payback period

1-3 years

Estimated lifetime of the initiative

>30 years

Comment

Hyosung plans to reduce power by changing the compressed air piping line and reducing the operating pressure of the air compressor at Anyang plant.

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Dedicated budget for energy efficiency	Hyosung plans annual budget for emissions reduction and investments to increase energy efficiency. The budget includes all energy efficiency projects, including facility replacements, change of energy source and process improvements. The company focuses on activities to reduce power use since the emissions from electricity use account for 69.8% of total emissions.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation

Group of products or services

Taxonomy used to classify product(s) or service(s) as low-carbon

Low-Carbon Investment (LCI) Registry Taxonomy

Type of product(s) or service(s)

Chemicals and plastics	Other, please specify (Environment friendly product)
------------------------	--

Description of product(s) or service(s)

1. Hyosung collected the needs for developing recycled automotive carpet from customers and started developing automotive carpet using recycled BCF (Bulked Continuous Filament). Developing products that satisfy customer requirements by using discarded fishing nets or yarns as nylon and polyester recycled chips, and by utilizing both Hyosung's spinning process waste and process wastes generated by recycled chip companies is in progress. 2. Hyosung is an eco-friendly product, Bio-PET BCF yarn (including bio contents), to satisfy customers' needs for an Eco-Green car. We are making and selling Bio-PET BCF automotive carpet products using Bio-PET BCF yarn.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)

No

Methodology used to calculate avoided emissions

<Not Applicable>

Life cycle stage(s) covered for the low-carbon product(s) or services(s)

<Not Applicable>

Functional unit used

<Not Applicable>

Reference product/service or baseline scenario used

<Not Applicable>

Life cycle stage(s) covered for the reference product/service or baseline scenario

<Not Applicable>

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario

<Not Applicable>

Explain your calculation of avoided emissions, including any assumptions

<Not Applicable>

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year

0.25

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?

No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?

Yes, a merger

Yes, other structural change, please specify (facility movement)

Name of organization(s) acquired, divested from, or merged with

1. Hyosung Transworld Corp. 2. Anyang HVDC test facility

Details of structural change(s), including completion dates

1. Hyosung Transworld Corp. was merged into Hyosung on January 29, 2021. 2. HYOSUNG HEAVY INDUSTRIES's HVDC test facility has been moved to Anyang, HYOSUNG. GHG emissions increased because Anyang HVDC test facility was included from the organizational boundary. The completion date is 29 November 2021.

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	Yes, a change in boundary	1. Hyosung Transworld Corp. was merged into Hyosung on January 29, 2021. 2. HYOSUNG HEAVY INDUSTRIES's HVDC test facility has been moved to Anyang, HYOSUNG. GHG emissions increased because Anyang HVDC test facility was included from the organizational boundary. The completion date is 29 November 2021. 3. Hyosung additionally calculated emissions of Scope 3 category 12 (End-of-life treatment of sold products) in the reporting year. Hyosung calculated emissions of 10 categories including additionally calculated ones in total in the reporting year. - 1.Purchased goods and services - 2.Capital goods - 3.Fuel-and-energy-related activities (not included in Scope 1 or 2) - 4.Upstream transportation and distribution - 5.Waste generated in operations - 6.Business travel - 8.Upstream Leased Assets - 9.Downstream transportation and distribution - 12.End-of-life treatment of sold products - 15.Investments

C5.1c

(C5.1c) Have your organization's base year emissions been recalculated as result of the changes or errors reported in C5.1a and C5.1b?

	Base year recalculation	Base year emissions recalculation policy, including significance threshold
Row 1	No, because the impact does not meet our significance threshold	Hyosung's greenhouse gas reduction goal is to reduce 14.5% of 2018 greenhouse gas emissions by 2030. Only Scope 1 and 2 emissions are included in the target, and they are regarded as a criticality criteria. In 2021, Hyosung Transworld Corp. was added to the organizational boundary. The emissions of Scope 1 and 2 in the base year of this workplace were not recalculated because they did not meet the criticality criteria for recalculation. Hyosung Transworld Corp. 's emissions in 2021 are 47 tCO2eq. Total GHG emissions (scope1+scope2) in 2021 are 33,364 tCO2eq. $47 / 33,364 * 100 = 0.14\%$ In 2021, Anyang HVDC testing facility was added to the organizational boundary. The emissions of Scope 1 and 2 in the base year of this facility were not recalculated because they did not meet the criticality criteria for recalculation. Anyang HVDC test facility's emissions in 2018 are 30 tCO2eq. Total GHG emissions (scope1+scope2) in 2018 are 35,071 tCO2eq. $30 / 35,071 * 100 = 0.09\%$ Hyosung added Scope 3 emission calculation category to calculate emissions in the reporting year. CDP 2021 had 9 categories but, emissions in the additional 1 categories in the reporting year were calculated. Hyosung calculated emissions in the 10 categories in total and implemented the CDP reporting. Scope 3 emission data, however, is not managed yet so that Hyosung plans to set Scope 3 base year through more reliable data management in the future.

C5.2

(C5.2) Provide your base year and base year emissions.

Scope 1

Base year start

January 1 2018

Base year end

December 31 2018

Base year emissions (metric tons CO2e)

10942.174

Comment

Hyosung sets the target for all domestic workplaces to reduce 14.5 % by 2030 compared to 2018. Hyosung's Scope 1 emissions in total in a base year (2018) were calculated as 10,942.174 tCO2eq'.

Scope 2 (location-based)

Base year start

January 1 2018

Base year end

December 31 2018

Base year emissions (metric tons CO2e)

24129.119

Comment

Hyosung sets the target for all domestic workplaces to reduce 14.5 % by 2030 compared to 2018. Hyosung's total Scope 2 emissions in a base year (2018) were calculated as 24,129.119tCO2eq'.

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The Korean power market is a single regional-based market supplied by Korea Electric Power Corporation (hereafter referred to as the KEPCO), and there is no private power market.

Scope 3 category 1: Purchased goods and services

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions were not set for the base year.

Scope 3 category 2: Capital goods

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions were not set for the base year.

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions were not set for the base year.

Scope 3 category 4: Upstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions were not set for the base year.

Scope 3 category 5: Waste generated in operations

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions were not set for the base year.

Scope 3 category 6: Business travel

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions were not set for the base year.

Scope 3 category 7: Employee commuting

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions were not set for the base year.

Scope 3 category 8: Upstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions were not set for the base year.

Scope 3 category 9: Downstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions were not set for the base year.

Scope 3 category 10: Processing of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions are not set for the base year.

Scope 3 category 11: Use of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions are not set for the base year.

Scope 3 category 12: End of life treatment of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions are not set for the base year.

Scope 3 category 13: Downstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions are not set for the base year.

Scope 3 category 14: Franchises

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions are not set for the base year.

Scope 3 category 15: Investments

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions are not set for the base year.

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions are not set for the base year.

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

Scope 3 emissions are not set for the base year.

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

Korea GHG and Energy Target Management System Operating Guidelines

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

9766.119

Start date

<Not Applicable>

End date

<Not Applicable>

Comment

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We have no operations where we are able to access electricity supplier emission factors or residual emissions factors and are unable to report a Scope 2, market-based figure

Comment

The Korean power market is a single regional-based market supplied by KEPCO, and there is no private power market.

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

23600.958

Scope 2, market-based (if applicable)

<Not Applicable>

Start date

<Not Applicable>

End date

<Not Applicable>

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

45511

Emissions calculation methodology

Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

In the reporting year (2021), not only key raw and secondary materials of carpet and BCF yarn including PET, NYLON, PP, latex, LLDPE, HDPE, calcium carbonate, color M/B but also waterworks and industrial water used in all domestic production sites were included for assessment. In 2021, emissions increased due to the expansion of raw and secondary materials calculation items. For activity data (product purchase amount), actual product purchase amount data managed through the system is applied. For emission factors, the Ministry of Environment's national LCI DB for each raw and subsidiary material purchased is first applied. If there is no domestic DB, the overseas LCI DB is used as follows or the emission factor of a similar materials was applied. - Emission calculation: \sum (annual raw material purchase (kg) X greenhouse gas emission factor by raw material (kgCO₂-eq)) - Purchased PET(polyethylene terephthalate)(kg) X PET(polyethylene terephthalate) Emission Factor (Ministry of Environment LCI DB) - Purchased NYLON(kg) X Polyamide Emission Factor(kgCO₂eq /kg, Ministry of Environment LCI DB) - Purchased PP(kg) X Polypropylene Emission Factor(kgCO₂eq /kg, Ministry of Environment LCI DB) - Purchased Latex(kg) X Latex Emission Factor(kgCO₂eq /kg, Ecoinvent3.8 LCI DB) - Purchased LLDPE(kg) X LLDPE Emission Factor(kgCO₂eq /kg, Ministry of Environment LCI DB) - Purchased HDPE(kg) X HDPE Emission Factor(kgCO₂eq /kg, Ministry of Environment LCI DB) - Purchased calcium carbonate (kg) X calcium carbonate Emission Factor(kgCO₂eq /kg, Ecoinvent3.8 LCI DB) - Purchased color M/B (kg) X weighted average of polyethylene terephthalate and Polyamide Emission Factor(kgCO₂eq /kg, Ministry of Environment LCI DB) - Water Usage(ton)*Water Emission Factor(National LCI DB) Emissions were calculated for each item based on the emission calculation methodology, and the final total was calculated as the emission of the relevant category. In addition, third-party verification was carried out of GHG emissions calculated through the process.

Capital goods

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

6

Emissions calculation methodology

Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Emissions related to purchase of 'personal computer, monitor, Tablet PC and PC main body' purchased in the reporting year (2021) were calculated. For activity data, actual product purchase amount data managed through internal purchase and capital system registration data was applied. Emission factors were calculated using emission factors of 'pre-manufacturing and manufacturing steps' in each product life cycle stage. If there is no carbon emission factor, the emission factor of a similar model was applied. In 2021, emissions decreased due to the latest emission factor update. - Emission calculation: \sum (individual computer & Tablet PC & laptop & monitor purchase amount (ea) X individual greenhouse gas emission coefficient (kgCO₂/ea))- Number of PCs registered X [Pre-process Stage GHG Emission Factor of PC(Ministry of Environment LCI DB) + Process Stage GHG Emission Factor of PC(Ministry of Environment LCI DB)] - Number of Tablet PCs registered X [Pre-process Stage GHG Emission Factor of Tablet PC(Ministry of Environment LCI DB)+ (Process Stage GHG Emission Factor of Tablet PC(Ministry of Environment LCI DB)) - Number of Laptops registered X [Pre-process Stage GHG Emission Factor of Laptop(Ministry of Environment LCI DB) +(Process Stage GHG Emission Factor of Laptop(Ministry of Environment LCI DB)) - Number of PC Monitors registered X [Pre-process Stage GHG Emission Factor of PC Monitor(Ministry of Environment LCI DB)+ (Process Stage GHG Emission Factor of PC Monitor(Ministry of Environment LCI DB))] Emissions were calculated for each item based on the emission calculation methodology, and the final total was calculated as the emission of the relevant category. In addition, third-party verification was carried out of GHG emissions calculated through the process.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

3681

Emissions calculation methodology

Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Emissions from production process of fuels which were purchased and used in 2021 and emissions due to loss of electricity and steam during distribution to business sites were calculated. For activity data, third-party verified greenhouse gas emission specification data were applied to all domestic business sites, and emission factors for each raw material production stage were applied for emission factors. In 2021, emissions decreased due to the latest emission factor update. - Emission calculation: \sum (annual fuel consumption X greenhouse gas emission factor by fuels) -Purchased fuels(kg) X GHG Emission Factor by fuels in production(kgCO2-eq/kg) (Ministry of Environment LCI DB) - [Electricity Consumption(kWh) + Loss electricity in transmission(kWh)] X Emission Factor of purchased Electricity(kgCO2-eq/kWh, Ministry of Environment LCI DB) - [Electricity Consumption(kWh) X manufacturing steps Emission Factor of purchased Electricity(ETS Emission Factor)] Emissions were calculated for each item based on the emission calculation methodology, and the final total was calculated as the emission of the relevant category. In addition, third-party verification was carried out of GHG emissions calculated through the process.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

755

Emissions calculation methodology

Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Emissions generated during the transportation of raw materials purchased for production in the reporting year (2021) were calculated. For activity data, data on the amount of key raw and secondary materials of carpet and BCF yarn including PET, NYLON, PP, latex, LLDPE, HDPE, calcium carbonate, color M/B, transportation distance from suppliers, and transportation means were used. Emission factors per unit distance for each transportation method were applied. In 2021, emissions increased due to the expansion of raw and secondary materials calculation items. - Emission calculation: \sum (annual purchase amount of raw and secondary material(PET, NYLON, PP, latex, LLDPE, HDPE, calcium carbonate, color M/B) (ton) X transportation distance (km) X GHG Emission Factor by transportation type(Ministry of Environment LCI DB) (kgCO2/ton.km) Emissions were calculated for each item based on the emission calculation methodology, and the final total was calculated as the emission of the relevant category. In addition, third-party verification was carried out of GHG emissions calculated through the process.

Waste generated in operations

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

343

Emissions calculation methodology

Waste-type-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Hyosung applied the emission factors depending on the type of waste and the treatment method when calculating emissions from wastes generated. For activity data, data on the amount of waste reported through the system was used. In 2021, emissions increased due to an increase in waste caused by an 11% increase in production. - Emission calculation: \sum (annual waste emission(kg) X GHG Emission factor by waste treatment method(Ministry of Environment LCI DB) (kgCO2/kg) - [General Waste discharged by landfill (ton) X Landfill Emission Factor]+ [General Waste discharged by Incineration X Incineration Emission Factor]+ [Designated Waste discharged by landfill (ton) X Landfill Emission Factor]+ [Designated Waste discharged by Incineration (ton) X Incineration Emission Factor]+ [General Waste discharged by Recycle (ton) X Recycle Emission Factor]+ [Designated Waste discharged by Recycle (ton) X Recycle Emission Factor(Ministry of Environment LCI DB)] Emissions were calculated for each item based on the emission calculation methodology, and the final total was calculated as the emission of the relevant category. In addition, third-party verification was carried out of GHG emissions calculated through the process.

Business travel

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

131

Emissions calculation methodology

Spend-based method
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Emissions resulting from domestic and overseas business trips of employees were calculated. In 2021, business trips fell sharply due to covid-19. 1) Overseas business trip - Emission calculation: $\sum(\sum(\text{Overseas business trip length per employee}(\text{km/person})) \times \text{GHG emission factor}(\text{kg-CO}_2/(\text{person} \times \text{km})) - \text{Emission factor: WRI}(\text{World Resource Institute}) \text{ and World Business Council for Sustainable Development, Calculating CO}_2 \text{ emission form mobile sources, Version 2.0 (middle distance)})$ 2) Domestic business trip - Emission calculation: $\sum \text{Annual individual usage of fuel}(\text{kg}) \times \text{Individual GHG emission factor}(\text{kgCO}_2/\text{kg}) - \text{Emission factor: Use of Ministry of Environment's carbon labeling emission factor, Ministry of Environment LCI DB}$ Emissions were calculated for each item based on the emission calculation methodology, and the final total was calculated as the emission of the relevant category. In addition, third-party verification was carried out of GHG emissions calculated through the process.

Employee commuting

Evaluation status

Relevant, not yet calculated

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Hyosung Anyang plant operate commuter buses for employees, which are already included in Scope 1 emissions. Therefore, there is no need for a separate calculation of emissions in this category. But the transportation type(bus, Train, etc) and distance for employees of Head office to commute not be calculated.

Upstream leased assets

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

70

Emissions calculation methodology

Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Hyosung already reports the amount of leased assets (buildings) emissions in scope 1, 2 under the K-ETS. Therefore, there is no need for a separate calculation of emissions in this category. Emissions were calculated for rental printers and cars. Emission factors were calculated using emission factors of 'pre-manufacturing and manufacturing steps' in each product life cycle stage. If there is no carbon emission factor, the emission factor of a similar model was applied. In 2021, the number of vehicle rental units tripled, increasing emissions. - Number of rental Printers X [Pre-process Stage Emission Factor of Printers (Ministry of Environment LCI DB) + Process Stage Emission Factor of Printers (Ministry of Environment LCI DB)] - Number of rental cars X [Pre-process Stage Emission Factor of cars (Ministry of Environment LCI DB) + Process Stage Emission Factor of cars (Ministry of Environment LCI DB)] Emissions were calculated for each item based on the emission calculation methodology, and the final total was calculated as the emission of the relevant category. In addition, third-party verification was carried out of GHG emissions calculated through the process.

Downstream transportation and distribution

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

408

Emissions calculation methodology

Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Emissions generated during the transportation of products produced in the reporting year (2021) were calculated. For activity data, data on sales amount of car mat, carpet, roll carpet, BCF yarn, Tile fabrics, transportation distance to customers, and transportation means were used. Emission factors per unit distance for each transportation method were applied. In 2021, emissions increased due to increased product sales amount. - Emission calculation: $\sum (\text{annual sales amount of products (car mat, option mat, roll carpet, BCF yarn, Tile fabrics)} (\text{ton}) \times \text{transportation distance (km)} \times \text{GHG Emission Factor by transportation type}(\text{Ministry of Environment LCI DB}) (\text{kgCO}_2/\text{ton.km})$ Emissions were calculated for each item based on the emission calculation methodology, and the final total was calculated as the emission of the relevant category. In addition, third-party verification was carried out of GHG emissions calculated through the process.

Processing of sold products

Evaluation status

Relevant, not yet calculated

Emissions in reporting year (metric tons CO₂e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Hyosung's products are BCF yarns and carpets which are intermediate materials, and are made into final materials through several steps. The additional processing process for the sold products is diverse, and the processing process that each partner company goes through is different. Therefore, it is difficult to assume emissions for that category. In addition, the additional processing process of the sold products has relatively little relevance as it is judged that it is difficult for Hyosung to exercise its influence in the future and it is difficult to proceed with greenhouse gas reduction activities.

Use of sold products

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO₂e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

There is no emission generated at the stage of use of our products(carpets, BCF yarns).

End of life treatment of sold products

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

9620

Emissions calculation methodology

Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

Please explain

Emissions generated during the transportation of products produced in the reporting year (2021) were calculated. For activity data, data on sales amount of car mat, carpet, roll carpet, BCF yarn, Tile fabrics was used. Statistical ratio, emission factors were applied depending on the type of waste and the treatment method. In 2021, emissions increased due to new calculations in this category. - Emission calculation: \sum (annual sales amount of products (car mat, option mat, roll carpet, BCF yarn, Tile fabrics) (kg) X Statistical ratio of waste treatment method (Korean Statistical Information Service)) X Waste GHG Emission Factor by waste treatment method (kgCO₂/kg, Ministry of Environment LCI DB) Emissions were calculated for each item based on the emission calculation methodology, and the final total was calculated as the emission of the relevant category. In addition, third-party verification was carried out of GHG emissions calculated through the process.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO₂e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Hyosung already reports the amount of Downstream leased assets(buildings) emissions in scope 1, 2 under the K-ETS. Therefore, there is no need for a separate calculation of emissions in this category.

Franchises

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Not applicable, since Hyosung does not own franchises.

Investments

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

341438

Emissions calculation methodology

Investment-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

\sum (Emissions (scope1+scope2) of Investment company (tCO2-eq) X Investment ratio (%)) - Emissions (scope1+scope2) of Hyosung TNC Corp. X 20% (Investment ratio) - Emissions (scope1+scope2) of Hyosung Heavy Industries Corp. X 32% (Investment ratio) - Emissions (scope1+scope2) of Hyosung Advanced Material Corp. X 21% (Investment ratio) - Emissions (scope1+scope2) of Hyosung Chemical Corp. X 20% (Investment ratio) - Emissions (scope1+scope2) of Hyosung TNS Corp. X 54% (Investment ratio) - Emissions (scope1+scope2) of Hyosung Goodsprings Corp. X 100% (Investment ratio) - Emissions (scope1+scope2) of Hyosung Holdings USA, Inc.. X 100% (Investment ratio) - Emissions (scope1+scope2) of GST Safety Textiles Mexico S. de R.L. de C.V X 100% (Investment ratio) It was calculated for four companies (Hyosung TNC corp., Hyosung Heavy Industries corp., Hyosung Advanced Materials corp., Hyosung Chemical corp.) that are divided from Hyosung and has been participating in K-ETS as it became a subject company to mandatory reporting of its GHGs emissions each year. In 2021, it also calculated the emissions of Hyosung T&S corp., Hyosung Good Springs corp., Hyoseong Holdings USA, Inc. (Decatur), and GST Safety Textiles Mexico S. de R.L. de C.V (Torreon), which are not subject to the emission trading system. Emissions were calculated for each item based on the emission calculation methodology, and the final total was calculated as the emission of the relevant category. In addition, third-party verification was carried out of GHG emissions calculated through the process.

Other (upstream)

Evaluation status

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Other (downstream)

Evaluation status

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.032

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

33367.08

Metric denominator

unit total revenue

Metric denominator: Unit total

1053086

Scope 2 figure used

Location-based

% change from previous year

71

Direction of change

Decreased

Reason for change

In 2021, sales revenue of Hyosung, a holding company, increased by 256.4% due to the improvement in the performance of its equity method subsidiaries. In 2021, total greenhouse gas emissions increased by 4.1% due to an increase in production due to the recovery of COVID-19. Product production increased by 11.6% compared to the previous year. Reduction activities reduced 1,549 tCO2e of greenhouse gas by replacing compressed air manufacturing facilities and control facilities, which is 5% of the 2021 emissions. Emissions compared to production did not increase significantly due to reduction activities. Also, compared to the increase in sales revenue, the size of the increase in emissions was small, so intensity figure decreased.

Intensity figure

53.82

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

33367.08

Metric denominator

full time equivalent (FTE) employee

Metric denominator: Unit total

620

Scope 2 figure used

Location-based

% change from previous year

1

Direction of change

Decreased

Reason for change

FTE increased by 5.1% and emissions increased 4.1%.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	9744.309	IPCC Second Assessment Report (SAR - 100 year)
CH4	5.752	IPCC Second Assessment Report (SAR - 100 year)
N2O	16.059	IPCC Second Assessment Report (SAR - 100 year)
HFCs	0	IPCC Second Assessment Report (SAR - 100 year)
PFCs	0	IPCC Second Assessment Report (SAR - 100 year)
SF6	0	IPCC Second Assessment Report (SAR - 100 year)
NF3	0	IPCC Second Assessment Report (SAR - 100 year)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
Republic of Korea	9766.119

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By activity

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Stationary combustion	9409.48
Mobile Combustion	356.639
Process Emissions	0

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Republic of Korea	23600.958	0

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By activity

C7.6c

(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Electricity	23282.082	0
Steam	318.876	0

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Increased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	
Other emissions reduction activities	1549	Decreased	4.83	1,549 tCO2eq of GHG was reduced through the replacement of compressed air manufacturing facilities and control facilities. Total GHG emissions (scope1+scope2) in 2020 are 32,061 tCO2eq. $1,549/32,061 * 100 = 4.83\%$
Divestment	0	No change	0	
Acquisitions	0	No change	0	
Mergers	47	Increased	0.15	Hyosung Transworld Corp. was merged into Hyosung on January 29, 2021. Hyosung Transworld Corp. 's emissions in 2021 are 47 tCO2eq. Total GHG emissions (scope1+scope2) in 2020 are 32,061 tCO2eq. $47 / 32,061 * 100 = 0.15\%$
Change in output	3709	Increased	11.57	Production increased by 11.6% year-on-year and would be 3,709tCO2eq considering the increase in output in 2020, based on production unit costs in 2020. Total GHG emissions (scope1+scope2) in 2020 are 32,061 tCO2eq. $3,709 / 32,061 * 100 = 11.57\%$
Change in methodology	0	No change	0	
Change in boundary	27	Increased	0.08	HYOSUNG HEAVY INDUSTRIES's HVDC test facility has been moved to Anyang, HYOSUNG. GHG emissions increased because Anyang HVDC test facility was included from the organizational boundary. The completion date is 29 November 2021. GHG emissions increased because Anyang HVDC test facility was included from the organizational boundary. Anyang HVDC test facility's emissions in 2021 are 27 tCO2eq. Total GHG emissions (scope1+scope2) in 2020 are 32,061 tCO2eq. $27 / 32,061 * 100 = 0.08\%$
Change in physical operating conditions	0	No change	0	
Unidentified	0	No change	0	
Other	0	No change	0	

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	52985.57	52985.57
Consumption of purchased or acquired electricity	<Not Applicable>	0	50678.16	50678.16
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	0	2462.5	2462.5
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	0	106126.23	106126.23

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	No
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Sustainable biomass

Heating value

Please select

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Not use

Other biomass

Heating value

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Not use

Other renewable fuels (e.g. renewable hydrogen)

Heating value

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Not use

Coal

Heating value

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Not use

Oil

Heating value

HHV

Total fuel MWh consumed by the organization

1497.48

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

1497.48

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Motor Gasoline, Diesel, kerosene Sum value

Gas

Heating value

HHV

Total fuel MWh consumed by the organization

51488.1

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

6050.07

MWh fuel consumed for self-generation of steam

45438.03

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

LNG, LPG, Propane Gas Sum value

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Not use

Total fuel

Heating value

HHV

Total fuel MWh consumed by the organization

52985.57

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

7547.54

MWh fuel consumed for self-generation of steam

45438.03

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Motor Gasoline, Diesel, kerosene, LNG, LPG, Propane Gas Sum value

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	0	0	0	0
Heat	6076.57	6076.57	0	0
Steam	45438.03	45438.03	0	0
Cooling	0	0	0	0

C8.2g

(C8.2g) Provide a breakdown of your non-fuel energy consumption by country.

Country/area

Republic of Korea

Consumption of electricity (MWh)

50678.16

Consumption of heat, steam, and cooling (MWh)

2462.5

Total non-fuel energy consumption (MWh) [Auto-calculated]

53140.66

Is this consumption excluded from your RE100 commitment?

<Not Applicable>

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description

Waste

Metric value

1957.5

Metric numerator

ton

Metric denominator (intensity metric only)

N/A

% change from previous year

16.5

Direction of change

Increased

Please explain

In 2021, emissions increased due to an increase in waste caused by an 11% increase in production

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

220715 2021 GHG emissions Third Partys Verification Statement(Hyosung)_scope1&2.pdf

Page/ section reference

1p

Relevant standard

Korean GHG and energy target management system

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

220715 2021 GHG emissions Third Partys Verification Statement(Hyosung)_scope1&2.pdf

Page/ section reference

1p

Relevant standard

Korean GHG and energy target management system

Proportion of reported emissions verified (%)

100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category

- Scope 3: Purchased goods and services
- Scope 3: Capital goods
- Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)
- Scope 3: Upstream transportation and distribution
- Scope 3: Waste generated in operations
- Scope 3: Business travel
- Scope 3: Upstream leased assets
- Scope 3: Investments
- Scope 3: Downstream transportation and distribution
- Scope 3: End-of-life treatment of sold products

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

220725 2021 GHG emissions Third Partys Verification Statement(Hyosung)_scope3.pdf

Page/section reference

1~2p

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C6. Emissions data	Year on year change in emissions (Scope 1 and 2)	Korean GHG and energy target management system	If the amount of carbon emission (scope1,2) by facilities by more than 10% compared to last year, the third party shall verify the reason. 220715 2021 GHG emissions Third Partys Verification Statement(Hyosung)_scope1&2.pdf 220630 2021 GHG Emission report(Hyosung).pdf
C7. Emissions breakdown	Year on year change in emissions (Scope 1 and 2)	Korean GHG and energy target management system	If the amount of carbon emission (scope1,2) by facilities by more than 10% compared to last year, the third party shall verify the reason. 220715 2021 GHG emissions Third Partys Verification Statement(Hyosung)_scope1&2.pdf 220630 2021 GHG Emission report(Hyosung).pdf
C8. Energy	Energy consumption	Korean GHG and energy target management system	Energy consumption is verified by third party based on purchase receipt. 220715 2021 GHG emissions Third Partys Verification Statement(Hyosung)_scope1&2.pdf 220630 2021 GHG Emission report(Hyosung).pdf

220715 2021 GHG emissions Third Partys Verification Statement(Hyosung)_scope1&2.pdf
220630 2021 GHG Emission report(Hyosung).pdf

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

Korea ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

Korea ETS

% of Scope 1 emissions covered by the ETS

100

% of Scope 2 emissions covered by the ETS

100

Period start date

January 1 2021

Period end date

December 31 2021

Allowances allocated

47985

Allowances purchased

0

Verified Scope 1 emissions in metric tons CO₂e

9766.12

Verified Scope 2 emissions in metric tons CO₂e

23600.958

Details of ownership

Facilities we own and operate

Comment

In 2021, the allocated emission of Hyosung was 47,985 tons and the final emissions was 33,364 tons and 4,900 tons were sold so that 9,721 tons were transferred to next year. (* The total emissions of each site are conservatively rounded down in the first decimal place, resulting in a difference from the total emissions.)

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

1) Establishment of GHG reduction strategy and strengthening governance

Hyosung has established its Green Management Vision 2030 to become an eco-friendly company that pioneers a better life for mankind. We have established four goals: reducing greenhouse gas emissions, developing eco-friendly technologies and expanding markets, creating an eco-friendly corporate culture and enhancing stakeholder trust. A company-wide climate change response strategy has been established based on specific tasks for each goal.

To meet the industry sector goal of South Korea's Nationally Determined Contribution (NDC) announced in 2021, we have updated our quantitative GHG reduction target of the Green Management Vision 2030 from 20.5% reduction compared to 2017 emission to 14.5% reduction compared to 2018 emission. In addition, we aim to realize green management in all our domestic business sites.

Every year, Hyosung establishes and operates facility investment plans for saving energy. In 2021, all relevant departments, including planning, research, production and power management established mid- to long-term GHG reduction plans to achieve the 2030 reduction goal, and the top management and the board of directors approved it. In the case of a reduction target that is difficult to achieve through internal energy saving efforts, we plan to implement the target over the long term through the purchase of renewable energy certificates from domestic third-party PPAs, as well as the purchase of green electricity, and to gradually increase our proportion of renewable energy use.

In April 2021, Hyosung expanded and restructured its existing Transparent Management Committee, which was in charge of governance sector in the BOD, into the ESG Management Committee, which integrates the environmental and social sectors. This committee discusses and decides on ESG-related policies, targets, risk management, investments, and action plans, and also covers climate change-related issues. Hyosung's Board of Directors (ESG Management Committee) is chaired by the former Minister of Environment, a climate change expert. In 2021, the Board of Directors dealt with a variety of issues, such as modifying the Green Management Vision 2030 policy, setting reduction targets, introducing internal carbon pricing, and excessive and shortage carbon credits in accordance with the emission trading system.

In addition, since July 2021, the existing EHS (Environment, Health, Safety) Committee and CSR Committee were integrated and expanded into the ESG Management Promotion Committee under the CEO to promote not only the environment, safety, and health, but to also address issues in Social Responsibility and Governance. The ESG Management Promotion Committee is held once a quarter to select major issues to be presented or reported to the BOD. The R&D Committee consists of the CEO and management representatives and is convened once every half year to establish R&D strategies based on the opinions of related departments such as sales, marketing, product development, and research.

As a dedicated organization, Hyosung has the ESG Management Department under the direct control of CEO and the Green Management Team under the Strategy Headquarter to establish climate change strategies, manage implementation, and disclose performance. Onsite power management teams and production departments are charged with reducing energy usage and GHG emissions.

2) Monitoring and sharing K-ETS policy trends

The Green Management Team participates in government briefings and meetings related to K-ETS, while expressing opinions through related industry associations to ensure the emission trading system can operate smoothly. Major details related to K-ETS are shared with the Environmental Safety Teams of each plant and are reported to the ESG Management Committee.

The Green Management Team report GHG emissions ever year complying with K-ETS, while analyzing allowances in surplus or shortage and establishing corresponding policies. In addition, the company regularly monitors price trends in the emission allowances market so that purchases can be made if necessary.

3) Implementation of greenhouse gas reduction activities, performance measurement

Each plant is carrying out facility replacement, energy efficiency and process improvement activities to reduce carbon emissions. The required budget is reflected in the annual financial plan of related operational departments, and KRW 455 million was invested in installing compressed air facilities for higher operation efficiency, and 1,549 tCO₂e of carbon emissions were reduced in 2021.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

Yes

C11.2a

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.

Credit origination or credit purchase

Credit origination

Project type

N2O

Project identification

N2O Abatement Project of Capro Corporation(CDM Project 4665)

Verified to which standard

CDM (Clean Development Mechanism)

Number of credits (metric tonnes CO2e)

33206

Number of credits (metric tonnes CO2e): Risk adjusted volume

33206

Credits cancelled

No

Purpose, e.g. compliance

Voluntary Offsetting

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Navigate GHG regulations

GHG Scope

Scope 1

Scope 2

Application

Cost Calculation and Performance on each division (performance unit).

Actual price(s) used (Currency /metric ton)

31000

Variance of price(s) used

uniform pricing. The internal carbon price set by Hyosung is based on the closing price of the first business day of the first week of October of the domestic carbon emission allowances.

Type of internal carbon price

Internal fee

Impact & implication

Internal carbon pricing has been introduced and implemented to manage risks and identify opportunities relating to climate change for strategic decision-making, such as business directions and investments. We distribute greenhouse gas emission calculators and guidelines for carbon emission calculations and economic feasibility evaluations throughout the company to conduct economic analyses based on accounting for the costs of excess and insufficient emission allowances, energy use plans for workplaces, and carbon prices according to greenhouse gas emissions. When selling or purchasing emission allowances due to surplus or lack of allocation emission allowances, it is reflected in cost according to the contribution of each Performance Unit and applied to establish provision for the expected shortage of emission allowances. This is affecting the promotion of greenhouse gas reduction activities for the relevant Performance Units.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, our customers/clients

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Engagement & incentivization (changing supplier behavior)

Details of engagement

Run an engagement campaign to educate suppliers about climate change
Climate change performance is featured in supplier awards scheme
Offer financial incentives for suppliers who reduce your operational emissions (Scopes 1 & 2)

% of suppliers by number

17.36

% total procurement spend (direct and indirect)

17.29

% of supplier-related Scope 3 emissions as reported in C6.5

0

Rationale for the coverage of your engagement

Hyosung Group selects our engagement target among its raw materials suppliers, taking into account the purchasing costs and impact

Impact of engagement, including measures of success

In 2021, they account for 17.29% of the total purchasing costs, and evaluation was completed for 50 raw and secondary materials suppliers. The cost of inspection and guidance for evaluating and responding to risks of suppliers is about KRW 1.0 million, which is included in the annual budget of Hyosung. Since 2016, Hyosung has been conducting consulting with suppliers to save energy and funding investments in energy efficiency facilities. We provided a total of 4.5 million won to one supplier in 2021. Also, the purchase of recycled NY chips, recycled PET chips and Bio PET chips is increasing for eco-friendly purchases. In 2021, Hyosung purchased eco-friendly products about KRW 319.8 million.

Comment

Hyosung Group reduces supplier risks and provides opportunities for suppliers to check their own sustainability status through annual diagnosis of supplier social responsibility management. The annual evaluation of suppliers consists of four parts, and the environmental part verifies the implementation of usage management and reduction activities for energy sources and water. After the evaluation via questionnaire, some partners are checked for facts and added points to their evaluations. The payment conditions are improved when selected as excellent partners through the evaluation of the purchasing team, and the monetary reward is provided when receiving the first prize of excellent supplier. Hyosung pursues green management to contribute to saving resources and to minimize environmental effects. In order to accomplish it, it made and implements own 'green purchase guidelines'. Main contents of green purchase guidelines is like the following, "purchases considering recourse saving", 'preferences to eco-friendly products (eco labelling, excellent recycled products)', 'continuous eco-friendly products R&D for the expansion of green purchase', and 'sharing with partner companies about green purchase guidelines and promoting improvement activities for product eco-friendliness', and Hyosung keeps the principles to participate in green purchase activities. Hyosung implements engagement activities to announce the proper guidelines to all supplier and leads suppliers to produce and to provide eco-friendly products by applying the principle to receive eco-friendly products first. It reduced the total carbon emissions from all production processes due to the cooperation through the engagement. Hyosung persistently implements green purchase activities every year and makes efforts to complete its social responsibility to end users and society. In 2021, Hyosung purchased eco-friendly products about KRW 319.8 million.

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement & Details of engagement

Education/information sharing	Share information about your products and relevant certification schemes (i.e. Energy STAR)
-------------------------------	---

% of customers by number

100

% of customer - related Scope 3 emissions as reported in C6.5

100

Please explain the rationale for selecting this group of customers and scope of engagement

Hyosung have been voluntarily responding to CDP Supply Chain since 2010, respectively, participating in CDP, and are publishing sustainability report every year. Hyosung has calculated and verified the carbon emissions of Scope 1 and Scope 2 to provide carbon information to customers. In addition, Hyosung provide information about the GRS(global recieved standard) certification obtained from 2020.

Impact of engagement, including measures of success

Hyosung has calculated and verified the carbon emissions of Scope 1 and Scope 2 to provide carbon information to customers. From 2017 to 2020, emissions decreased every year. In 2021, through various efforts to reduce greenhouse gas emissions, the greenhouse gas emissions were reduced by about 4.9% compared to the base year of 2018. In 2020, greenhouse gas emissions have decreased due to reduced production due to COVID-19 in 2020. Therefore, the year 2021 was up 4.1 percent from the previous year.

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?

Yes, climate-related requirements are included in our supplier contracts

C12.2a

(C12.2a) Provide details of the climate-related requirements that suppliers have to meet as part of your organization's purchasing process and the compliance mechanisms in place.

Climate-related requirement

Complying with regulatory requirements

Description of this climate related requirement

To implement green management, Hyosung knows the need to manage GHG emissions and Scope 3 emissions. Accordingly, when evaluating suppliers, whether each supplier engages in environmental management activities and manages energy use is taken into consideration as the supplier evaluation criteria. Hyosung has established the evaluation criteria for supplier registration. This includes traditional criteria such as quality of supplied products, delivery time, price, and business performance. It also includes environmental, safety and ethical business standards. Supplier evaluation is also carried out based on the same criteria. Evaluation of supplier is basically conducted once a year, and evaluation surveys or on-site visits are conducted. According to the evaluation result grade, measures such as giving priority to the contract are being taken. In addition, Hyosung includes the contents of four management areas, 'ethics, environment, labor/human rights, and safety/health', which are essential elements of ESG management in the Supplier Code of Conduct. By presenting the code of conduct for each area in detail, it induces suppliers to comply with the code of conduct. Hyosung presents behavioral rules for environmental impact improvement activities on energy use reduction, and encourages partner companies to practice eco-friendly management. Hyosung applies these behavior rules to all suppliers.

% suppliers by procurement spend that have to comply with this climate-related requirement

100

% suppliers by procurement spend in compliance with this climate-related requirement

0

Mechanisms for monitoring compliance with this climate-related requirement

Supplier scorecard or rating

Response to supplier non-compliance with this climate-related requirement

Retain and engage

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

Direct or indirect engagement that could influence policy, law, or regulation that may impact the climate

Yes, we engage directly with policy makers

Yes, we engage indirectly through trade associations

Yes, we engage indirectly by funding other organizations whose activities may influence policy, law, or regulation that may significantly impact the climate

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?

Yes

Attach commitment or position statement(s)

Sustainability with Stakeholders report : Green Management Vision 2030(18p)

220729 2021 Sustainability with Stakeholders report(Hyosung).pdf

Describe the process(es) your organization has in place to ensure that your engagement activities are consistent with your overall climate change strategy

Hyosung is strengthening cooperation in the entire levels of value chain including the government, supply chain and client company in order to effectively respond to K-ETS. In order to achieve the national emissions reduction target, it is necessary to improve K-ETS efficiently, and Hyosung is providing information about the industry and suggesting opinions on policy implementation through the Korea Chemical Fibers Association. Internally, Hyosung is monitoring K-ETS policy trends, establishing strategies to reduce emissions, strengthening the relevant governance system, and implementing reduction activities for each plant. As the risk management of climate change in the supply chain becomes more important, the company has added additional items about energy use in the supplier evaluation and gives additional points to suppliers enhancing their capacity for climate change. We provide reliable information related to our carbon emissions through annual business report, sustainable management report and environmental information disclosure portal site. Hyosung's green management aims to reduce carbon emissions and includes detailed action plans such as reducing the use of raw materials, including water and power, and facilitating recycling and reuse. Government policy along with engagement activities with supply chain and customers are important elements of green management of Hyosung and are integrated in the green management system keeping up with changes in policies and markets

Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

C12.3a

(C12.3a) On what policy, law, or regulation that may impact the climate has your organization been engaging directly with policy makers in the reporting year?

Focus of policy, law, or regulation that may impact the climate

Emissions trading schemes

Specify the policy, law, or regulation on which your organization is engaging with policy makers

The Korean government made the Act on the Allocation and Trading of Greenhouse Gas Emission Permits based on the Framework Act on Low-carbon Green Growth and has implemented since January 2015. This system allows the government to allot yearly base allowance to workplaces to emit GHG within the allocation range, assesses actual GHG emissions of allotted workplaces and permits trading surplus and deficiency of allowances between workplaces. Now the 3rd Planning Phase (2021~2025) is ongoing. The government applies increasingly enhanced reduction criteria to induce active reduction. Hyosung has been a subject of K-ETS since 2015. Also, for system improvement and efficient operation, the government has annually held presentations and hearings about system management. Hyosung has participated in them to suggest various opinions.

Policy, law, or regulation geographic coverage

National

Country/region the policy, law, or regulation applies to

Republic of Korea

Your organization's position on the policy, law, or regulation

Support with minor exceptions

Description of engagement with policy makers

Hyosung provides data needed for K-ETS operations when requested by the government. In the reporting year, ban on gathering became effective due to covid-19 issues. As a result, Public hearings and presentations were not held, so Hyosung could not directly attend. Instead, Hyosung expressed its opinions on greenhouse gas policies through the Korea Chemical Fibers Association, which functions as a channel to government.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation

In the reporting year, public hearings and presentations were not held inevitably due to Covid-19. Hyosung presented its opinion on policies related to climate change through the industrial association which it belongs to. 1. Difficulties in GHG reduction Hyosung already introduced most reductions (replacement with highly efficient equipment) which can be used in workplaces so that it is difficult to reduce when product production and GHG emissions increase due to company growth. It is necessary for Hyosung to find out external reduction business or to purchase allowances for further reduction. However, it is difficult to discover external reduction business. The current policy does not recommend using offset allowance (given use period of allowances, decline in using ratio (%), etc. These matters cause difficulties. 2. Opinion on consulting programs for supporting tasks related to climate change in workplaces - Investing in energy reduction projects, government support or education is often not opened for the major companies. Most companies, however, are major companies which are subjects of emission trading scheme. - Know-how consulting support for recognition as GHG reduction business corresponding to ETS external business (Advance preparation to meet to the requirements: installation measurement equipment for monitoring emissions before and after business, training of endurance period for economic additionality, etc.) - Know-how consulting of energy reduction plan by changing operational system without facility replacement 3. Comments on 2030 South Korea's Nationally Determined Contribution (NDC) upgrade plan and 2050 Carbon Neutrality Plan For carbon neutrality, it needs more support for efficiency enhancement of facilities in companies and for expansion of renewable energy usage. Additionally, in the participation process in the related policy management and system, Hyosung will present actively its opinions and to be reflected in government policy in the future.

Have you evaluated whether your organization's engagement is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Focus of policy, law, or regulation that may impact the climate

Low-carbon, non-renewable energy generation

Specify the policy, law, or regulation on which your organization is engaging with policy makers

After the Korean government announced the 'Road Map for Invigorating Hydrogen Economy', the Korean government built an institutional foundation for the implementation of the hydrogen economy such as ① Enactment of the world's first hydrogen law, ② R&D, infrastructure, hydrogen vehicle, charging station, safety, and standards for each of the six areas, ③ the establishment of the Hydrogen Economic Committee. The 'Hydrogen Act' was implemented in February 2021. The purpose of this system is to contribute to the development of the national economy and securing public safety by creating a foundation for promoting the implementation of the hydrogen economy and promoting the systematic development of the hydrogen industry. As of May 2022, Hyosung Group has the largest share of hydrogen charging stations in Korea and operates 23 out of 104 units nationwide. The production and sales of hydrogen, one of Hyosung Chemical's new growth engines, have something in common with the 'Road Map for Invigorating Hydrogen Economy' presented by the government in January 2020, are prospected to make large commitments to vitalize the domestic hydrogen economy and are expected to reach to KRW 25 trillion in 2030. Hyosung Group will invest a total of KRW 1.3 trillion by 2031 to build a value chain covering the production(green hydrogen plants with the capacity of 200,000 tons/yr and a liquid grey hydrogen plant with the capacity of 13,000 tons per year), transportation and charging facilities.

Policy, law, or regulation geographic coverage

National

Country/region the policy, law, or regulation applies to

Republic of Korea

Your organization's position on the policy, law, or regulation

Support with no exceptions

Description of engagement with policy makers

Hyosung participated in the 'Hydrogen Economic Performance and Hydrogen Leading National Vision Report' held in Incheon on October 7, 2021 as part of the 'Road Map for Invigorating Hydrogen Economy' and the 'Hydrogen Act'. This event was prepared to review the past achievements to advance the hydrogen economy and to strengthen the will of companies. Key government officials, including the Deputy Prime Minister of Economy and the Minister of Industry, and major companies leading the hydrogen industry, such as Hyosung Vice Chairman Cho Hyun-sang, attended. President Moon Jae-in, who promised full support, said he would convert gray hydrogen, which emits a lot of carbon, to 100% clean hydrogen by 2050, and set up more than 2,000 hydrogen charging stations across the country.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation

<Not Applicable>

Have you evaluated whether your organization's engagement is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

C12.3b

(C12.3b) Provide details of the trade associations your organization engages with which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association

Other, please specify (Korea Chemical Fibers Association)

Is your organization's position on climate change consistent with theirs?

Consistent

Has your organization influenced, or is your organization attempting to influence their position?

We publicly promote their current position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)

The Korea Chemical Fiber Association seeks to rationalize management for technological development, quality improvement, productivity improvement, and international competitiveness reinforcement in the Korean chemical fiber industry. In addition, KCFA aims to contribute to the promotion of the industry and the sound development of related industries by promoting friendship and common interests among member companies. The members of Korea Chemical Fibers Association are the major domestic chemical fiber manufacturers. The sustainable activities of Korea Chemical Fibers Association are as follows. 1. It delivers contents of regulations related domestic, foreign climate change and environment. It hears opinions from companies. As a channel to government, it presented the opinions to Ministry of Environment, Ministry of Trade, Industry and Energy, Ministry of Strategy and Finance, etcetera. After then the Carbon Neutrality Commission was established last year, it presented opinions on chemical fiber. 2. It holds explanation meetings and seminars about sustainability management for companies. In 2021, sustainability management education was provided to two companies. 3. It shares technology trends by sharing technologies for sustainable eco-friendly products / energy reduction and market trends. Companies regularly gathered to present each energy reduction activities. Hyosung joins Korea Chemical Fibers Association to share information on climate change with the domestic chemical fiber companies and to present unified opinions of the industry. Korea Chemical Fibers Association supports the domestic chemical fiber companies to meet these Hyosung's needs. At first, Korea Chemical Fibers Association provides a forum for sharing information on responses to climate change with domestic chemical fiber companies. Hyosung participates in the meeting which Korea Chemical Fibers Association arranged. Domestic chemical fiber companies share energy reduction activity there. Hyosung shares the contents with other companies. In addition, Hyosung is presenting industry opinions on domestic greenhouse gas policies and reduction support programs to the Chemical Fiber Association to create a unified industry opinion and propose them to the government. When the Presidential Carbon Neutral Green Growth Committee was created in 2021, the Korea Chemical Fiber Association led the industry as a representative of the chemical fiber industry to express the opinions of the industry.

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)

0

Describe the aim of your organization's funding

<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Trade association

Other, please specify (Korea Federation of Textile Industries)

Is your organization's position on climate change consistent with theirs?

Consistent

Has your organization influenced, or is your organization attempting to influence their position?

We publicly promote their current position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)

As the core of the textile industry, the Korea Federation of Textile Industries presents a mid- to long-term vision and strengthening the competitiveness of the textile and fashion industry so that it can quickly respond to the rapidly changing global market environment and discover and strengthen new growth momentum. The Korea Federation of Textile Industries is engaged in various activities to strengthen competitiveness in response to changes in the external environment, to intensify knowledge, to establish a foundation for cooperation among textile industries, and to raise awareness of the textile industry. The Korea Federation of Textile Industries suggested 'Textile and Fashion Industry's Implementation Strategy for Korean New Deal' there. In order to be converted into the sustainable textile and fashion industry, the strategy set the transition to eco-friendly industry responding to enhancing global environmental regulations as the goal, and presented promotion works such as development of eco-friendly fiber materials, dyeing business's transition to green industry, promotion of ecosystem for resources recycling green textiles. The government announced a plan to invest a total of KRW 1.4 trillion by 2026. The vice chairperson of Hyosung took office as the 15th chairperson of the Korea Federation of Textile Industries. Hyosung plans to make eco-friendly ecosystem by developing eco-friendly materials and production technologies for the transition to the eco-friendly industry responding to strengthening global environmental regulations and climate change and constructing clean factories. The Korea Federation of Textile Industries held the 35th 'Textiles Day' event in November 2021 together with the Ministry of Trade, Industry and Energy. In his commemorative speech, the Chairman of the Korea Federation of Textile Industries said, "Uncertainties are increasing due to environmental changes caused by COVID-19 and global supply chain reorganization." he emphasized. In addition, the president of the Korea Federation of Textile Industries will work together to build a sustainable eco-friendly ecosystem of the textile and fashion industry and secure global capabilities through industrial structure innovation using digital technology and solidarity and cooperation between the government and textile fashion streams. Let's go," he urged.

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)

0

Describe the aim of your organization's funding

<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is not aligned

C12.3c

(C12.3c) Provide details of the funding you provided to other organizations in the reporting year whose activities could influence policy, law, or regulation that may impact the climate.

Type of organization

Trust or foundation

State the organization to which you provided funding

Jeonbuk Creative Economy Innovation Center

Funding figure your organization provided to this organization in the reporting year (currency as selected in C0.4)

780000000

Describe the aim of this funding and how it could influence policy, law or regulation that may impact the climate

Hyosung contributed KRW 30.9 billion from 2015 to 2021 as a company in charge of the Jeonbuk Creative Economy Innovation Center. Hyosung has built a carbon-specialized business incubation center, supports new start-ups (financial support, transfer of management know-how, commercialization of ideas), and supports business partners to develop markets and advance into overseas markets.

Have you evaluated whether this funding is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is not aligned

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

220310 2021 Business report(Hyosung).pdf

Page/Section reference

405-407p 21-119p 437-440p

Content elements

Governance

Strategy

Risks & opportunities

Emissions figures

Comment

Publication

In other regulatory filings

Status

Complete

Attach the document

220630 2021 Environmental Information Disclosure Report(Hyosung).pdf

Page/Section reference

3-4p 10-24p

Content elements

Emissions figures

Other metrics

Comment

Publication

In voluntary sustainability report

Status

Complete

Attach the document

220729 2021 Sustainability with Stakeholders report(Hyosung).pdf

Page/Section reference

50-51p 60p 30-31,37-40,18-19p 69-71p

Content elements

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

Comment

(Sustainability report) sustainability report including climate change related activities in 2021 completed in Korean and the English version will be released on the homepage within August.

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	No, but we plan to have both within the next two years	<Not Applicable>	<Not Applicable>

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	No, but we plan to do so within the next 2 years	<Not Applicable>	<Not Applicable>

C15.3

(C15.3) Does your organization assess the impact of its value chain on biodiversity?

	Does your organization assess the impact of its value chain on biodiversity?	Portfolio
Row 1	No, but we plan to assess biodiversity-related impacts within the next two years	<Not Applicable>

C15.4

(C15.4) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity-related commitments
Row 1	No, we are not taking any actions to progress our biodiversity-related commitments, but we plan to within the next two years	<Not Applicable>

C15.5

(C15.5) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	No, we do not use indicators, but plan to within the next two years	State and benefit indicators

C15.6

(C15.6) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
No publications	<Not Applicable>	<Not Applicable>

C16. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	CEO & President, Hyosung Corp.	Chief Executive Officer (CEO)

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

SC1.2

(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

Allocation challenges	Please explain what would help you overcome these challenges
Diversity of product lines makes accurately accounting for each product/product line cost ineffective	Installing detailed monitoring system for each product line would cost large amount of capital so that it is considered cost ineffective at this point especially because the particular business group only accounts for small portion of GHG inventory of Hyosung Corporation. In order to overcome this challenge, Hyosung Corporation is seeking Government funding to expand GHG monitoring systems.

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?

Please select

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below

I have read and accept the applicable Terms