

C0. Introduction

C0.1

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

Hyosung TNC is the main company of Hyosung Group based on chemical fibers and trading. It was established in February 1957 as Hyosung Trading Co. Ltd. The fibers and trading divisions were spun off into a new company, Hyosung TNC in June 2018.

As of 2021, Hyosung TNC achieved KRW 4.5608 trillion in sales and KRW 324.1 billion in operating profit.

Hyosung TNC is separately involved in the fibers division and the trading division and intends to optimize customer value through innovative fiber technology and global trading networks.

The fiber division supplies yarns, textiles, and dyeing product such as spandex, nylon, polyester, and so on, and manufactures and sells a variety of products as well as 'Creora', the No. 1 brand in the global spandex market shares based on the original production technology and R&D. It has grown as a globally leading company. The fiber division developed and sold Bio-based spandex from natural resources, released Regen firstly developed in Korea, and developed eco-friendly fiber materials such as Mipan Regen, a recycled nylon product by recycling by-products in the process of fiber product production, and Creora Regen, a recycled spandex product.

In the trading division, the steel and chemistry sectors import and export steel products and petrochemical and fine chemistry products, and raw materials. It leads the steel product trade by enhancing the partnership with global customers.

(Responses to climate change)

Hyosung TNC is a company that considers the industry's sustainable growth and GHG reduction at the same time. It actively promotes ESG management for the better sustainable management system by establishing sustainable management system.

Hyosung TNC made 4 strategies and detailed tasks for Hyosung's Green Management Vision 2030, 'the realization of an eco-friendly company leading a better human life,' and has implemented green management.

(ESG Management)

In addition, Hyosung TNC newly established ESG Management Vision, 'completing the circular economy model through the world's best technology for fiber materials and trade networks and building a happy tomorrow' which reflects its management competencies and business characteristics. It has implemented corporate social responsibility through the establishment of management goals and detailed strategies focusing on the 4 core values, 'circular economy,' 'carbon reduction,' 'health and safety,' and 'win win growth'

Hyosung TNC has actively committed to the efforts of GHG reduction through the participation in the 'textile and paper industry council for carbon neutrality to release a joint declaration on the carbon neutrality of the industry, and so on. It pushes ahead carbon footprint calculation to verify product excellence. Also, Hyosung TNC obtained externally authorized environment certifications (GRS, OEKO-TEX, et cetera) for resource circulation and harmful substance reduction.

(GHG reduction targets)

The Korean government presented upward 2030 national GHG reduction targets and determined to reduce industrial sector GHG by 14.5 % compared to 2018' in October 2021. To comply with it, Hyosung TNC also set GHG reduction targets in the reporting year as '2030 GHG emissions reduction by 14.5% compared to 2018'. It has implemented GHG reduction activities to achieve each annual reduction target.

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	KR7298020009

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
Chief Executive Officer (CEO)	As the attention to environmental management has increased in the world and Hyosung TNC is also implementing sustainability management to manage and solve the issues related to climate change in step with the global trend. Hyosung TNC runs an ESG management system on the board of directors to fulfill positively sustainability management. The existing 'EHS committee and CSR committee run as individual bodies. To manage them comprehensively and to enhance their authority and responsibility, Hyosung TNC established an exclusive organization, 'ESG Management Committee' and appointed the CEO as the top decision maker in 2021. In the ESG Management Committee, the members are heads from ESG related department, the committee manager consists of directors of management strategy. The committee makes main decisions about the following ESG promotion agenda; ESG management directions, strategies, and goals, and budget establishment on the company-wide level. Also, it monitors the promotion process of the main implementation works and the performance of each business area and emission reduction activities from the ESG strategic viewpoint. The committee plays the role of the top decision-making body by making sure ESG management implemented. The ESG Management Committee also monitors climate change issues, establishes strategies, reports quarterly climate change issues and risk assessment activities to the board of directors, and then makes the top decisions. Issues such as environment, energy, and climate change are closely related to the comprehensive management strategy and business management so that the board of directors deals with the proper issue in consideration of critical issues in the comprehensive management including financial design. The board of directors quarterly makes strategies for main management activities. It includes financial and investment designs for enhancing the existing business capability and diversifying business as well as climate change issues. The board of directors, particularly, made the following main decisions on climate change in the reporting year. - first quarter of 2021 : ESG management missions and system establishment. - 2nd - 4th quarter : making 4 MOUs related to eco-friendly products (Regen Seoul, Regen Ocean, Pleatsmama, Jeollanam-do Province, Posco-Yeosu Gwangyang Port Authority).

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 annual budgets Reviewing and guiding business plans Setting performance objectives	<Not Applicable>	The climate change issue is one of the critical issues in the company-wide management in Hyosung TNC. The climate change agendas are firstly reported to ESG Management Committee and then to the board of directors. The board makes decisions about the agenda through the final approval. 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 TNC’s ESG management vision, business strategies, business plans, and budget and investment plans. Sustainability management activities are always reported in the regular meeting (on schedule after reviewing reporting system). As a rule, each decision-making agenda shall be approved by a majority. In 2021, the board of directors reviewed and approved the following major business plans. - Establishment of Hyosung TNS’s ESG Management Vision System - Review and approval of activities and promotion plans of ‘ESG Management Committee’ - MOU of recycling waste PET bottles as resources (production and distribution of ‘eco-friendly uniforms’ from yarn by recycling waste PET bottles) - LCA (Life Cycle Assessment) of recycled Polyester yarn - MOU with a startup company that produces fashion goods from regen yarn.

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	No, but we plan to address this within the next two years	<Not Applicable>	Important but not an immediate priority	Hyosung TNC is aware of the importance of ESG management including climate change issues and established an ESG management mission and an exclusive promotion body in the reporting year. As of the reporting year, there are no members with expertise on climate change issues yet, but Hyosung TNC will constructively drive ESG management and green management in the future and put together board members with expertise on climate change.

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	<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).

The existing sustainability management committees were the EHS Committee and the CSR Committee. They were merged into the ESG Management Committee of the CEO.

The ESG management team was newly established in 2021 for running the ESG Management Committee and is exclusively in charge of management. This team implements various activities for the ESG Management Vision.

The ESG Management Committee is a subcommittee of the CEO. It consists of the CEO as the chairperson, chiefs from the departments related to ESG (heads of each department, directors in charge, plant managers from each plant) as committee members, and the head of a management strategy department as a secretary.

(And it established and runs the SHE Committee of the ESG Management Committee, a subcommittee in charge of health and safety)

The CEO is the chairperson and makes the final decision by calling and managing a committee meeting, adopting the agenda, the progress of proceedings, adjustments, and so on. The CEO is exclusively in charge of all responsibilities.

The ESG Management Committee is in charge of monitoring, reporting, and measuring environmental issues including climate change on the company-wide level. It runs an ESG management team consisting of the main relevant departments for implementing them.

(ESG management team: green management division) establishment of a strategy for climate change (responses to climate change, environmental management strategy, environmental risk management)

(ESG management team: general affairs team) establishment and implementation of eco-friendly transition strategies and plans, management, and responses to related regulatory risk

(ESG management team: purchasing team) establishment of management strategy for supply chains like green procurement and risk management

(ESG management team: environmental safety team) management of safety risk and establishment of environmental improvement goals detailed promotion plans

Each department analyzed how climate change issues influence on itself and then established and reported responding strategies to the ESG Management Committee. The committee decided on priorities in the importantly urgent agenda after the reports and determined on such decision matters.

The ESG Management Committee distinctively holds the regular meeting (twice a year) and provisional meetings and decides when a majority of the current directors are present and approve by majority approval.

Matters for decision and main facts in the ESG Management Committee are quarterly reported to the board of directors.

Apart from the ESG Management Committee, management committee is quarterly held to evaluate and to make public Hyosung TNC's operation situations with stockholders and stakeholders. The 'ESG management' is one of the main reports at the meeting. It quarterly monitors response activities for climate change.

In 2021, the following main items were reported to the board of directors.

1. Establishing the Hyosung TNC's ESG Management Vision System
2. Sharing ESG assessment results (CDP, KCGS, Sustainvest)
3. MOU on eco-friendly business
4. Promoting energy companion business for small and medium business
5. Promoting regen LCA

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 TNC 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 project Emissions reduction target Efficiency project Behavior change related indicator Supply chain engagement	Hyosung TNC sets KPI by reflecting contents of ESG management promotion of committee members (the board member level) related ESG issues(including climate change issues) to promote actively ESG management. Their performance is assessed based on it and affects monetary incentives such as yearly pay raise rates and performance-based bonuses. The degree of improvement in specified risk factors in management plans is set as KPI. The accomplishment is assessed and reflected in personnel evaluation. When constructing assessment items of KPI, it reflected the requirements related to ESG management promotion including climate change issues in Hyosung TNC, and also included contents about the diagnostic items scheme in ESG management guidelines for companies released by the Ministry of Trade, Industry and Energy in Korea. For actively promoting ESG management, climate change related indexes are 'achieving targets through management of GHG emissions and reduction,' 'management of energy consumption and reduction,' and 'climate change education for employees' in workplaces that are directly run by Hyosung TNC. KPI index contains 'collection of management strategies for supply chain' for engagement management of supply chain and 'eco-friendly purchasing activities' as well.

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 TNC considers 1~3 years as 'short-term'.
Medium-term	3	5	Hyosung TNC considers 3~5 years as 'medium-term'.
Long-term	5	10	Hyosung TNC considers 5~10 years as 'long-term'.

C2.1b

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

When defining 'a real financial risk or a strategic risk' about the company-wide operation including climate change issues, Hyosung TNC keeps and manages financial impact and non-financial impact separately, and applies the following criteria.

- financial materiality: Considering financial impacts in each business including climate change issues, Hyosung TNC operates the company-widely exclusive delegation provisions such as responsibility and authorization. It defined a criterion for materiality based on them. Exclusive delegation provisions are separated into managed investment in a budget and investment out of budget. The proper provision becomes a criterion for the decision-making on the company-wide budget establishment and investment activities including risks and opportunities caused by climate change.

(Investment in a budget) in the case of more than KRW 1 billion, the investment is dealt with in a management meeting in regulation

(Investment outside of budget) in the case of KRW 0.5~1 billion, the investment is dealt with CEO level in regulation. In case of more than 1 billion, the investment is dealt with in a management meeting in regulation

Considering the top decision-making steps about climate change, Hyosung TNC defines the criterion for a really important financial impact assessment. This means that each financial investment should be dealt with at the CEO level above if it needs 'more than KRW 500 million per case'.

- non-financial materiality : Hyosung TNC separates and analyzes climate change risks and opportunities by using non-financial items such as reputational risk and management risk. Among them, it considers reputational risk has a real influence on finance or strategy. It is difficult to convert reputational risk into quantitative numbers definitely, but Hyosung TNC decided that the reputational risk is most likely to affect customer churn, worsening sales, revocation of contracts, divestment, and so on. Therefore, it considers the reputational risk as a criterion that has a real influence on financial and strategic aspects.

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

[Direct operations] Hyosung TNC 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 TNC 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. The financial department regularly supervises the measurement of financial risk, assessment, and hedging through cooperation with domestic and foreign suppliers. Non-financial risk is managed by the following bodies: the ESG management team of the CEO and the strategy division, the company-wide risk management body centered in the support center and the working body for responding to the workplace environment, safety, litigation risk and so on which led by chiefs in PU and plant managers. The process for specification, assessment, and responses to company-widely possible risks including climate change issues is like the following. (Risk specification) Understanding the current status inside and outside by investigating the requirements from inside and outside stakeholders → specifying risk through SWOT, and 3C analysis in each specified issue (Risk assessment) Assessing the seriousness of each risk after considering the possibility and occurrence time of the specified risk and the extent of financial and non-financial impacts, (Risk responses) Making responses to each risk and implementing the response activities (among them, the achievement of responses to main risks is assessed) Specified items as main risks in the proper process are reported to the board of directors and the CEO and the CEO's decision-making on the responses for the risk management is shared company-widely and applied through the ESG management teams. The non-specified items are also managed by constant monitoring. The current status of risk is yearly updated and managed, and the proper data is reflected when the ESG Management Committee makes decisions on climate change issues. [Upstream] 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 TNC established behavior rules of suppliers and criteria for ESG assessment for all the suppliers. They allow Hyosung TNC to understand generally the current status in management including climate change and to manage it systematically. [Downstream] Hyosung TNC is a B-to-B company to produce not end products but intermediate ones. Hyosung TNC analyzes the risks of client companies and then actively manages downstream issues such as client companies and end consumers. Because the issues could be linked to new business opportunities for product and technology development to lessen the client risks. To grasp and manage the current risk status systematically, and to manage systematically VOCs (Voice of the customer) to catch the customer and market trend internally, Hyosung TNC developed GBIS (Global Business Information System) and used the system company-widely. The regular improvement of the GBIS system allows it to manage risk management systematically by catching up with clients' valuable information and core needs. The main risks from VOC analysis are reported at the regular VOC meeting (weekly in the VOC Committee, monthly in the VOC meeting) and are used for seeking new business opportunities.

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	The Hyosung TNC's compliance team regularly monitors risks in the domestic and foreign regulations, assesses the impact on risks, and implements the responding activities. Currently, Korea runs GHG Emissions Trading Scheme. Hyosung TNC has been subject to yearly mandatory reporting of GHG emissions and regulations since 2015. The government allocated GHG emission allowances to the ETS subjected companies. When the companies exceed the allowances, the government requires the regulated companies to purchase the allowance deficiency. In addition, allowance prices are expected to rise due to stricter regulations like the EU's carbon border tax. Hyosung TNC set the goal to reduce GHG emissions by 14.5 % by 2030 compared to 2018 and implements activities to reduce GHG emissions for the yearly goal. Financial risks for purchasing allowances may occur when the emissions exceed the ETS allocations, and non-financial reputational risks may also occur when it doesn't meet the regulatory requirements. Therefore, the compliance team manages ETS regulations as risks, and it understands and reports calculation and analysis of GHG emissions, yearly deficiency, and financial impacts to minimize the risks. In 2021, it implemented energy reduction activities by investing a budget of KRW 506 million in the new efficient facilities and improvement of environmental facilities. It finally reported to the board of directors that it will continue energy reduction activities by establishing a budget of approximately KRW 893 million in 2022.
Emerging regulation	Relevant, always included	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 TNC directly so that it assesses the impacts by including the impacts in the company-wide risk assessment process. In July 2021, the European Commission announced that it will implement 'a carbon border tax'. This tax imposes a carbon tax on imported goods emitting much carbon for the target of a 55% reduction by 2030. It will start from the trial introduction in 2023 and settle down to the tax from 2026. It is, therefore, expected that the carbon border tax would affect directly exports of Hyosung TNC, a global company. Hyosung TNC's ESG Management and Planning Team judged the EU carbon border tax as a risk, it analyzed its impacts on each PU. 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 TNC's products to respond to carbon border tax and invested about KRW 17 million in the system construction to respond to the demand for information disclosure on carbon emissions from products through system construction in 2022.
Technology	Relevant, always included	The customers' interest in 'eco-friendly goods' grows. Particularly, in the fashion clothes sector, customer sentiment on sustainability in fashion (eco-friendly and value-centered consumption) continuously becomes higher. Due to the trend of eco-friendliness in the fashion industry, technology for eco-friendly products and the production of various eco-friendly products become prominent issues. Without attention to technology development of eco-friendly products in the trend, Hyosung TNC could face the risk of a decrease in sales. So that it implements technology development through continuous R&D. In particular, Hyosung TNC developed technologies related to eco-friendly production by applying a recycling method to minimize product impacts on the environment. Additionally, it developed technology to expand the area into bio-based eco-friendly products of non-edible and biological raw materials. It also develops technologies for biodegradable yarn to accomplish Nature to Nature circular economy. Hyosung TNC made efforts to improve the marine environment and to realize a model for resource circulation by finally developing the original NY depolymerization/refinement technology (yarn technology to recycle waste fishing nets) in the reporting year which started in 2019~2020. Hyosung TNC invested about KRW 2.608 billion as the eco-friendly R&D cost to implement the following tasks: development of technology for Bio-degradable yarn and technology for recycled polyester and industrialization of technology for NY Chemical Recycle and so on. Hyosung TNC is actively implementing R&D for developing original technology for recycled materials and bio raw materials from plants to assure eco-friendliness in the raw material phase of eco-friendly products and makes an annual budget for the investment cost of eco-friendly tasks for the leading technology development. In 2022, it drew up a budget of KRW 1.765 billion for eco-friendly technology R&D.

	Relevance & inclusion	Please explain
Legal	Relevant, always included	The government operates a GHG emissions trading scheme. The ETS is implemented based on 'the Law on Allocation and Trading of GHG Emissions ('ETS law'),' and Hyosung TNC has been a subject of annual mandatory reporting of its GHG emissions since 2018. When the relevant company in the system has problems due to 'omission of the emissions reporting,' 'no submission of the verification results of allowances', no submission of allowances, and so on, a fine of less than KRW 10 million is imposed depending on each case (Article 43, ETS Law). 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 equivalent to a deficiency when settling allowances (Article 33, ETS Law). These troubles may lead to such direct financial losses and also bring about non-financial important risks, increasing the negative reputation of stakeholders at home and abroad, due to lawsuits related to climate change. In Hyosung TNC, the Legal Compliance Team conducts legal reviews to minimize such risk occurrence and the ESG Management Team minimizes risk occurrence through preemptive responses like regularly monitoring requirements related to regulations and changes. Meanwhile, all types of decision-making including climate change lawsuits are determined by the arbitrary delegation of authority according to the amount. If the cost is more than KRW 300 million and if the compensation is more than KRW 100 million when an agreement was concluded, the final approval will be made at the level of the CEO or higher.
Market	Relevant, always included	Consumers' needs and behavior changes work as possible opportunities or risk factors in markets. If we do not understand changes in markets immediately, negative reputational risk of stakeholders may occur and promptly bring about financial risks like a decrease in sales so that they are managed as a critical risk. Hyosung TNC continuously monitors rapidly changing market situations and needs of client companies and consumers to minimize risks. It introduced and operated the VOC system to maximize opportunities. Hyosung TNC developed and company-wide introduced 'GBIS (Global Business Information System)' to systemically manage VOC and operate 'VOC Committee', a regular meeting group, to discuss VOC professionally. The VOC Committee makes regularly discussions, shares issues, and processes feedback every month. The dealt issues are shared with the board of directors in each division and the customers' needs are reflected in the final decision-making. As the results of the recent operation and analysis of the VOC system, we can find out that the demand for recycled plastic yarn from buyers gradually increases. Particularly, the demand for recycled plastic materials has recently grown. This relates to the regulations on plastic usage which have begun in earnest since the EU introduced plastic taxation in 2021 and to the announcement that Korea will reduce 20 % of plastic usage by 2050. Hyosung TNC already developed a technology for yarn to use recycled plastics and then launched the brand called REGEN 10 years ago. In the reporting year, Hyosung TNC signed an MOU with local governments such as Jeju, Seoul (Gangnam, Geumcheon, Yeongdeungpo) and fashion brands. It launched 'Regen Jeju' and 'Regen Seoul' using waste PET bottles and developed recycled plastic yarn using waste PET bottles from Yeosu Gwangyang Port Authority and ships entering and clearing. Hyosung TNC acquired the OBP (Ocean Bound Plastic) Certification for the first time in Korea. Hyosung TNC has introduced the eco-friendliness of regen in markets. These results can be confirmed in REGEN sales. It has shown about twice the annual growth in sales since 2017 and Hyosung TNC achieved about 10 times sales in 2021 compared to 2017. Hyosung TNC will sell Bio-based spandex yarn as well as recycled plastic in the future. In addition, it will continuously develop biodegradation technologies for yarn and hold the technologies in the long term.
Reputation	Relevant, always included	The major customers of Hyosung TNC are global fashion brands, and they require disclosure of information on climate change as well as sustainability management at the international level. If Hyosung TNC does not actively respond to the demand from abroad, non-financial risk called reputational risk may occur and additionally, financial risk like a decrease in operating profit may occur as well. The 'reputation' of stakeholders is one of the items which are managed as critical risks by Hyosung TNC. The Promotional Team, therefore, continuously analyzes and manages reputational risk and implements various activities to prevent Hyosung TNC's reputational risk through active responses. Global fashion companies, major clients of Hyosung TNC made plans to use 100% of raw materials for clothes as 'recycled fiber' and 'renewable fiber' and began to demand fiber suppliers to develop and supply 'eco-friendly products' and to acquire certifications related to product's eco-friendliness. Hyosung TNC acquired the international GRS (Global Recycled Standard) Certification of 8 eco-friendly products (4 polyester yarn regens from waste PET bottles, 2 recycled nylon yarn of Mipan Regen, 1 recycled spandex yarn of Creora Regen and 1 eco-friendly yarn product) based on recycling to respond to the demand. One of the products(Regen Ocean) obtained OBP (Ocean Bound Plastic) product certification for the first time in Korea. It separately establishes a budget for acquisition and updating certifications every year. Hyosung TNC also makes efforts to respond to climate change by registering Bio-Based Spandex in MIS (Material Sustainability Index) of 'Higg Index,' an index for environmental impact assessment developed by SCA (Sustainable Apparel Coalition). Apart from these, Hyosung TNC was asked for information on climate change (strategy for climate change, quantitative data about GHG, carbon emission data of each product) from 4 client companies (drylock, BASF, etcetera). Hyosung TNC answered all the requirements. In addition, Hyosung TNC 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. And Hyosung TNC voluntarily participates in CDP programs, released sustainability management, reports, and discloses information on climate change.
Acute physical	Relevant, always included	The frequency of abnormal climates such as typhoons and heavy rainfall increases in East Asia including Korea due to climate change and the strength also gets higher. In Korea, 8 of the 10 typhoons with the strongest speed occurred after 2000. China accounts for the largest number of foreign suppliers to provide the local plants with raw materials. Due to the typhoon named Lekima in 2019, China experienced the second-largest damage (economic losses of about KRW 10 trillion) in history and the heavy rainfall brought about economic losses of KRW 53 trillion in total in 2020 and 2021. Such large typhoons and heavy rainfalls may cause not only production problems in the domestic plants and workplaces but also problems in the buyer's production and product distribution at home and abroad. These problems may decrease production efficiency and generate property loss in sales. In Hyosung TNC's domestic workplaces, Hyosung TNC judged the frequency of physical environment change (acute physical change) in the short term increases every year and establishes management rules (emergency measurements) for the emergency of environmental safety in each workplace. Facilities are regularly checked by each team in charge. And to minimize monetary damage when damage occurs due to physical environment change, Hyosung TNC annually renews disaster insurance. In the supplier case, physical environment change may go far beyond raw materials supplies to Hyosung TNC. Particularly, the possibility of the relevant risk can become high in China, one of the main suppliers. So, Hyosung TNC plans behavior rules for suppliers to check the status of responding to climate change in suppliers at home and abroad, and urges them to make measures. Particularly, it demands that suppliers in China should make management rules for emergencies like domestic workplaces, check preemptive responses (inspection of drainage facilities, management of retaining walls, electronic facilities check) to abnormal climates such as typhoons and heavy rainfalls, and then strengthen the weak points.
Chronic physical	Relevant, always included	The rise of average temperature and sea level is one of the changing factors in the physical environment due to climate change in the long run. According to Meteorological Administration's report, the average temperature in the 2010s rose by about 0.8 °C compared to the 1980s and the average annual precipitation rose by about 7.4 % during the same period. In particular, rise rates of ocean temperatures and sea level around Korea are predicted to be approximately twice or three times higher than the average rise rate of the global maritime. These changes may cause risks in the operating cost rise to Hyosung TNC having one main production plant on the coasts (Ulsan) to manufacture fiber yarn. Fiber yarn, the main product, requires the plant to maintain the internal average temperature at 25~30°C to keep a desirable product quality so that heating and cooling facilities work when the temperature exceeds a certain level. According, to rise in the average temperature, particularly intense heat in summer may lead to a direct increase in heating and cooling facilities to bring about a rise in the operating cost. Also, the production plant on the coast (Ulsan) recognizes that the rise in sea level may cause flood hazards in the future. To prepare for the situation, Hyosung TNC consistently assesses the physical risks in the coastal area by using '26~82cm' which means rising sea level height at the end of the 21st century in an IPCC report and Climate Central's 'Coastal Risk Screening Tool: By Water Level.'

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

In October 2021, the Korean government determined the upgrade plan for the 2030 national GHG emissions reduction targets, a '40 % reduction in national GHG emissions by 2030 compared to 2018'. It implements the GHG emissions trading scheme to achieve the national GHG reduction target. Hyosung TNC became a subject of ETS in 2018 and its allocation has been allocated every year. It implements GHG reduction activities to achieve the targets. Now depending on the relevant business, the paid allocation in the 3rd ETS phase uses 10 % of the total allocation. Hyosung TNC is not the corresponding type of business so it is allocated 100 % free allocation. The consequent GHG free allocation of Hyosung TNC is '416,524tCO2 eq' in the reporting year (2021). It is higher than the '365,136.44tCO2 eq' of the annual emissions in total in the reporting year and makes earned surplus by selling allowances. However, the EU recently introduced the carbon border tax and announced abolishing the free allocation of allowances by steps. The Korean government is also expected to show the same trend so that free allocation will be reduced in the future. The 4th phase of the emission trading system will start in 2026. Hyosung TNC is also expected to be a subject company of paid allocation. Considering the global trend, it becomes higher than 10 % of the paid allocation ratio in the 3rd planning phase. Based on this expectation, the paid allocation in the 4th planning phase is expected to be 15 %, the general expectation from Korea government and industries, or 60 % equivalent to the EU level. So, Hyosung TNC internally analyzes risks to comply with the expectation. Considering the reduction status of ETS free allocation with the increase of internal production (the results of analyzing economic growth announced by the Bank of Korea in 2021). It seems that deficiency in GHG allowances due to business growth and a decrease in free allocation since 2026 (the 4th ETS phase) occur. The deficiency is expected to be 63,718tCO2 at least and 210,929tCO2 at most. (Assumptions) - Increase in production and emissions uses 3.0 % of economic growth announced by the Bank of Korea in November 2021. - In the 4th phase of Korea's emissions trading scheme, 15 % ~60 % in paid allocation is applied. - Predictions of free allocation consider a coefficient of the average emissions in the recent 3 years after except that of the last year (5 % of reduction value).

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)

1975258000

Potential financial impact figure – maximum (currency)

6538799000

Explanation of financial impact figure

Based on the 3% economic growth announced by the Bank of Korea in November 2021, Hyosung TNC analyzes the increasing trends of internal business growth in the future. Considering emissions increase due to business growth, the emissions are expected to be 355,431tCO2 in 2026. In addition, Hyosung TNC is expected to have paid allocation obligations. As ETS paid allocation increases, the expected ETS free allocation is 291,713tCO2 in the case of 15% paid allocation and 144,502tCO2 in the case of 60 % paid allocation equivalent to EU. Considering the internal business growth and the operation details of ETS, deficiency in emissions is expected to be 63,718~210,929tCO2 as of 2026. This situation may bring about purchasing deficiency in allowance. Based on the internal carbon price, the financial impact is estimated at approximately KRW 1,975,258,000~6,538,799,000 when applying approximately KRW 31 thousand per ton as the allowance price.

Cost of response to risk

519000000

Description of response and explanation of cost calculation

Hyosung TNC calculates GHG emissions, externally verifies the results, and then submits the results to the government. In addition, it makes and implements preemptive plans through reduction activities to prevent deficiency in GHG allowance. - Third-party verification of emissions reports: KRW 13 million - Investment cost for GHG reduction activities: KRW 506 million

Comment

Identifier

Risk 2

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 TNC is a B-to-B 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 TNC 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 TNC is relevant to an 'upstreaming' stakeholder, client companies' management object. The main client companies demand disclosing Hyosung TNC's sustainability management (in particular, environmental management including climate change). The demand for eco-friendliness of supply products (Hyosung TNC'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 TNC recognizes it as a critical risk to generate a direct decrease in sales such as transaction suspension and contract cancellation. In the reporting year (2021), 4 client companies in total including BASF, drylock demanded Hyosung TNC for disclosing information on climate change. The increasing demand means quantified data as well as general management related to climate change such as business strategies and management status. Particularly, BASF asked for information on carbon footprints by product and detailed data on the implantation of LCA by product. Hyosung TNC has annually provided relevant information to all client companies who ask for information

disclosure. Additionally, the demand for the production and supply of 'products from eco-friendly fiber yarn' grows from the main client companies (Nike, Adidas, Lululemon, Osprey, etcetera.) of Hyosung TNC. To deal with the demand, Hyosung TNC develops and produces eco-friendly products through sustainable R&D, acquired authorized certifications (GRS, OEKO-TEX, OBP certifications), and implements product LCA to verify the eco-friendliness of products. Hyosung TNC consistently makes efforts to minimize reputational risk by promptly responding to the increasing demand from client companies.

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)

46222000000

Potential financial impact figure – maximum (currency)

61630000000

Explanation of financial impact figure

When Hyosung TNC 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 TNC's sales from eco-friendly products were about KRW 77,037 million. Considering the decline in sales (60~80%) from eco-friendly product supply, as of 2021 potential financial impact was estimated at KRW 46,222 million at least and KRW 61,630 million at most.

Cost of response to risk

2734000000

Description of response and explanation of cost calculation

Hyosung TNC manages client companies' demand as a critical risk and primarily responds to the demand through various activities to minimize negative reputational risk. To provide clients with information on the results of carbon emissions., LCA consulting was conducted for the main production products and will construct a management system for CO2 emissions through LCA for all products in the future. Additionally, Hyosung TNC implements R&D for eco-friendly products and continues the acquisition and renewal of eco-friendly certifications. Apart from these activities, Hyosung TNC voluntarily implemented the production of sustainability reports and consulting for CDP participation to respond to the request for disclosing information on climate change issues. - LCA consulting (regen) cost: KRW 15 million - Cost for constructing LCA calculation system of products: KRW 17 million - R&D cost for eco-friendly products: KRW 2.608 billion - Costs for eco-friendly certification acquisition (GRS, OEKO-TEX, OBT certifications) and renewal: KRW 45 million (GRS: KRW 23 million, OEOK-TEX: KRW 9 million, OBP: KRW 13 million) - Writing sustainability reports and verification costs: KRW 26 million - Consulting cost for CDP: KRW 23 million

Comment

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Acute physical	Cyclone, hurricane, typhoon
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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

With the frequency of heavy rainfall, typhoon, and heavy snow due to the speedy climate change, the possibility of distribution problems grows not only in Hyosung TNC's workplaces but also in workplaces for the supply chain at home and abroad. The physical risks of climate change can cause damage to the physical assets of manufacturing plants. When these problems occur directly in production facilities, plants may shut down to generate risks to decline in production and supply capabilities. Due to the characteristics of the 'yarn' product, floods and water leaks can cause quality decline (deteriorating dyeing) to result in additional losses in sales. From the distribution aspect in the supply chain, problems such as port shutdown and distribution delays due to typhoons or localized heavy rains disrupt production. This disruption may generate losses in sales. It is difficult to predict physical changes in the short term. When it occurs, this leads to losses in product supply capability and sales. So, it is considered and managed as a critical impact on direct financial risk. In response, Hyosung TNC manages to minimize physical risk by establishing environment, safety, and emergency management regulations in each workplace. According to the regulations, it includes proactive inspection items and a situational response manual. It takes action to recover damage immediately following the risk management manual when a physical risk occurs. Each team in charge monthly implements regular facility inspection to improve safety requirements. In 2021, Hyosung TNC completed a total of 610 improvements. To minimize losses due to monetary damage and recovery, additionally, it bought comprehensive disaster insurance. The coverage includes all kinds of abnormal climates like the followings: typhoons, heavy rainfall, wind and waves, floods, and tsunamis. Hyosung TNC makes efforts to minimize damages. It made its own behavior rules including responses to climate change, provided suppliers with the rules, specified risks due to physical changes, and immediately responds to the risks.

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)

45608000000

Potential financial impact figure – maximum (currency)

136824000000

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 TNC, however, calculated the expected damage due to operation suspension of production facilities and losses if 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 total sales. In 2021, the total sales of Hyosung TNC were approximately KRW 4.5608 trillion and possible damage was tentatively estimated at KRW 45.608 billion at least ~ 136.824 billion in the next 1 year.

Cost of response to risk

3949880000

Description of response and explanation of cost calculation

Hyosung TNC established management regulations for emergencies and spread the emergency instructions to prevent damages caused by climate change, abnormal climate in the whole domestic workplaces. Emergency exit routes and emergency shelters are noticeably marked in the plants. Each team itself carries out safety inspection in every month and comes up with improvements to minimize facility damage in emergency. In 2021, safety inspection was implemented in accordance with the emergency regulations for emergency and Gumi Plant invested approximately KRW 332 million in a total of 610 cases for facility maintenance. In addition, Hyosung TNC bought and has maintained comprehensive disaster insurance to minimize physical damage and recovery due to abnormal climate. As distribution risk could occur in suppliers so that Hyosung TNC reserves approximately 8 % surplus (equivalent to one month surplus) of annual raw material usage. In 2019, particularly, localized heavy rain largely damaged suppliers in China. Hyosung TNC made efforts to minimize risks to production when the similar risk occurs in the future by purchasing surplus of raw materials in advance from the damaged Chinese suppliers since then. - Premium of annual comprehensive accident insurance: KRW 107 million - Improvement costs for safety inspection and facility maintenance at Gumi Plant in the reporting year: KRW 332 million - 8 % of KRW 43.886 billion in total purchasing cost for additional raw materials from suppliers in China: KRW 3.51088 billion

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?

Direct operations

Opportunity type

Markets

Primary climate-related opportunity driver

Other, please specify (Creating surplus profit by participating in ETS)

Primary potential financial impact

Other, please specify (Creating surplus profit by participating in ETS)

Company-specific description

The Korean government operates the GHG emissions trading system. Hyosung TNC has become a subject of allocation since 2018. It has been allocated allocation every year. It implements the allocation. Hyosung TNC has begun to apply ETS since 2018. After that it has conducted various GHG reduction activities to meet allocation requirements every year during the 4-year transition period to 2021. Consequently, it has implemented ETS without deficiency in allowances (GHG emissions less than allocation). As the results, Hyosung TNC traded 26,000 tons of GHG surplus allowances at KRW 21.5 thousand per ton and gained a total of KRW 559 million in profits in 2020 and then sold 27,000 tons of allowances at KRW 20.736 thousand per ton and earned a total of KRW 560 million in 2021. Hyosung TNC estimated the expected emissions, allocations in the 3rd Planning Phase (2021 ~ 2025) and emissions targets to analyze annual deficiency. As the results, it is estimated that Hyosung TNC makes GHG emissions less than the allocation for 4 years until 2025 before the 4th Planning Phase begins. And if Hyosung TNC implements GHG reduction activities in each workplace, it could make surplus in profit during the 3rd Planning Phase (2021 ~ 2025) through the participation in ETS.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

2658064000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The followings are the Hyosung TNC's assumptions on allocation during the 3rd Planning Phase (2021 ~ 2025), the expected emissions and GHG reduction activities in accordance with business plans. - (GHG emissions in workplaces) When applying the 3% economic growth rate announced by the Bank of Korea in November 2021, the production and emissions increase is a total of 1,573,423tCO₂ during the period of 2022~2025. - (Allocations in workplaces) Allocation during the 3rd Planning Phase 2022~2025 is a total of 1,657,719tCO₂. - (GHG reduction activities in workplaces) In the current plan and implementation the expected reductions from 3 GHG reduction activities in 2022 are about 362tCO₂. Provided GHG reduction activities equivalent to the 2022 level during the period of 2023~2025, 1,448tCO₂ can be reduced. Depending on the results of annual deficiency in 2022 to 2025, a total of 85,744tCO₂ (allocation – GHG emissions + expected GHG reductions) in surplus allowances is expected to occur. Basing on the internal carbon price, the results of converting financial impacts is 85,744tCO₂ X 31,000 won (internal carbon price) = 2,658,064,000 won.

Cost to realize opportunity

519000000

Strategy to realize opportunity and explanation of cost calculation

Hyosung TNC is transferring to the relevant system as a participant company in Emissions Trading System. It carries out the external verification to submit the monitoring plan of each workplace and the statement for the regulatory transition and then submits them to the government. At the same time, it promotes various GHG reduction activities to achieve GHG reduction targets and to reduce emission within ETS allocation. Hyosung TNC works hard to achieve its own GHG reduction targets and to generate maximum surplus in profit within ETS by minimizing GHG emissions through various activities. Provided that Hyosung TNC uses the same verification cost and implements GHG reduction activities during the period of 2022-2025, opportunity costs were calculated as a total of KRW 2.076 billion. - Third party verification of annual emissions reporting: KRW 13 million - Annual investment in GHG reduction activities: KRW 506 million (Assumptions) Hyosung TNC invests the same cost in the above two items, 'third party verification of GHG emissions reporting,' 'investment in GHG reduction activities' during the period of 2022-2025.

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Other, please specify (Reputational benefits resulting in increased demand for goods/services)

Primary potential financial impact

Other, please specify (Reputational benefits resulting from responses to stakeholders' demands, and increased demand for goods / services resulting from it.)

Company-specific description

The attention to eco-friendly consumption and value-centered consumption in the global fashion fiber market rises in the ESG management times. Hyosung TNC actively participates in eco-friendly campaigns of global fashion manufacturing companies. It declared the goal to increase the global rPET ratio (recycled polyester fiber production in the polyester production) by 45 % until 2025. Particularly, Nike, Lululemon and H&M, Hyosung TNC's main client companies, participate in the campaigns. To achieve the goal, the main client companies require Hyosung TNC, an upstream, eco-friendly fiber supply and to acquire eco-friendly certifications of supply products. Hyosung TNC develops and produces eco-friendly products to respond to the demand from client companies and to strengthen product competitiveness. It participated in promotion activities of product eco-friendliness through acquisition of authorized eco-friendly certifications. In 2019, Hyosung TNC started to acquire the GRS (Global Recycle Standard) certification for the first time in the fiber industry, currently got and renews (maintains) GRS certification of recycled spandex (Creora Regen), nylon (Mipan Regen) and polyester regen. In addition, Hyosung TNC's recycled polyester from sea plastics acquired OBP (Ocean Bound Plastic) Certification of Dutch Control Union for the first time in Korea in the reporting year. Hyosung TNC also annually renews OEKO-TEX[®] STANDARD 100 Certification issued by an international institute of textiles and leathers. As needs for eco-friendly fiber, particularly recycled polyester fiber grow, Hyosung TNC strengthens recycled and eco-friendly product lineup like the followings: 'Regen, a polyester yarn from waste PET bottles,' 'Mipan Regen, a recycled nylon yarn,' 'Creora Regen, recycled spandex yarn.' These active responses lead to annually growing sales of eco-friendly products (approximately 74 % increase compared to 2020, approximately 170 % increase compared to 2017).

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)

115554897696

Potential financial impact figure – maximum (currency)

154073196928

Explanation of financial impact figure

Hyosung TNC makes efforts for continuous R&D of various eco-friendly products and for production improvement to respond to demand from client companies and market trends and promotes eco-friendliness internally and externally through acquisition of certifications of eco-friendly products. Owing to these efforts, the sales of eco-friendly products continuously increase for the past 5 years. The average sales rose approximately 1~1.7 times compared to the previous year. So, Hyosung TNC internally expects

the rise of eco-friendly product sales to increase approximately 1.5–2 times compared to the last year. When using KRW '77,036,598,464' of 2021 as a criterion sale, the sales from eco-friendly product supply is expected to rise to approximately KRW '115,554,897,696 at least ~ 154,073,196,928 at most in 2022.

Cost to realize opportunity

2653000000

Strategy to realize opportunity and explanation of cost calculation

Hyosung TNC 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) various environment certifications. Hyosung TNC renewed GRS and OEKO-TEX certifications launched a 'Regen Ocean,' acquired the OBP certification for the first time in Korea, and registered Bio-based Spandex in MSI (Material Sustainability Index) of 'Higg Index,' an index for environmental effects evaluation developed by SAC (Sustainable Apparel Coalition) in the reporting year. - R&D cost of eco-friendly product in 2021: KRW 2.608 billion - Costs for eco-friendly certification acquisition (GRS, OEKO-TEX, OBT certifications) and renewal: KRW 45 million (GRS: KRW 23 million, OEKO-TEX: KRW 9 million, OBP: KRW 13 million)

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

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 through access to new and emerging markets

Company-specific description

As global fashion manufacturers (Adidas, Lululemon, H&M, etcetera.), Hyosung TNC's main client companies, actively demand 'recycled polyester yarn,' an eco-friendly product, Hyosung TNC implements continuous R&D to expand the production and supply of related products. Particularly, it makes efforts to introduce positively eco-friendly yarns by using recycled materials. It manufactures recycling-based products, and they are largely divided into 'polyester yarn Regen from waste PET bottles,' 'Mipan regen, a recycled nylon yarn' and 'Creora Regen, a recycled spandex yarn'. It positively drives R&D of recycled products to commercialize variously 'regen' every year. Hyosung TNC launched Regen, a recycled polyester yarn made from PET bottles for the first time in Korea in 2008. It developed and released Regen Ocean products, a polyester yarn, in 2021 through continuous R&D. 'Regen Ocean' is a product manufactured by recycling transparent PET bottles from entering and clearing ships Hyosung TNC developed it in cooperation with Yeosu Gwangyang Port Authority and acquired the OBP (Ocean Bound Plastic) Certification in the first time in Korea. In addition, Hyosung TNC developed 'Mipan Regen Ocean' through the development of technology to manufacture recycled nylon newly by using collected waste fishing nets in the ocean and technology to construct depolymerization facilities and to enhance quality. And Hyosung TNC is planning to commercialize this product in 2023. In 2021, Hyosung TNC implemented product LCA for the existing general products and the following 3 products: polyester regen recycling transparent waste PET bottles, Creora Regen recycling by-products from the production process, Bio-based spandex using nonedible food ingredients as raw materials. As a result, it confirmed effectiveness of reducing carbon emissions. Hyosung makes consistently efforts to become a leading company in eco-friendly fiber and yarn market in the future through development and supply of more eco-friendly products and through calculation of carbon reduction effects by conducting LCA.

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)

389997780000

Potential financial impact figure – maximum (currency)

1232585575000

Explanation of financial impact figure

The sales of Hyosung TNC's eco-friendly product consistently increases as much as approximately 1~1.7 times compared to the last year for the past 5 years. Hyosung TNC makes efforts to diversify eco-friendly products through R&D of production technology for eco-friendly products Accordingly, the increase range in sales is expected to be approximately 1.5–2 times in the future. When using KRW '77,036,598,464' in 2021 as a criterion sale, the sales from eco-friendly product supply is expected to rise to approximately KRW 389,997,780,000 at least ~ 1,232,585,575,000 at most in 2025. In 2023, Hyosung TNC will start officially selling 'MIPAN regen ocean' products, a yarn from recycled waste fishing nets which completed technology industrialization in the reporting year.

Cost to realize opportunity

17182000000

Strategy to realize opportunity and explanation of cost calculation

In 2021, Hyosung TNC invested a total of KRW 2.608 billion in R&D for eco-friendly products (Bio-degradable yarn technology, recycled polyester technology for reducing wastewater usage from dyeing processing, industrialization of NY Chemical Recycle technology). As the investment cost for constructing other facilities for eco-friendly yarn, the budget of KRW 14.574 billion was approved from the board of directors. - R&D cost for eco-friendly products ('Bio-degradable yarn technology, recycled polyester technology for reducing wastewater usage from dyeing processing, industrialization of NY Chemical Recycle technology'): KRW 2.608 billion - Cost for constructing other facilities for eco-friendly yarn: about KRW 14.574 billion

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 TNC promotes Green Management and ESG 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 TNC 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	No, but we anticipate using qualitative and/or quantitative analysis in the next two years	Important but not an immediate priority	Hyosung TNC considers climate change issues and possible risks as well as the consequent impact on its business. As of now, the establishment of management strategy through scenario analysis is not realized yet, but it will implement scenario analysis to respond to the expected climate change issues and regulations in the future. Considering the global trend that the direction moves to climate change risks and adaptation, Hyosung TNC internally reviews scenario analysis and application of such as RCP8.5 and PCP 4.5 bases presented in the IPCC guidelines.

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	Hyosung TNC is a global manufacturer of spandex. It understands the seriousness of urgent environmental problems and leads the introduction of eco-friendly yarns using recycled materials in cooperation with fashion companies in front industry to respond to them. Also, Hyosung TNC consistently invests in production to use eco-friendly biomaterials instead of fossil materials Hyosung TNC developed and manufactures recycled products using 3 fiber products (nylon, polyester, spandex) - Recycled nylon: 'Mipan,' a nylon yarn by recycling by-products in the production process - Recycled polyester: 'Regen,' 'Regen Ocean (production in2021),' 'Regen Jesu,' 'Regen Seoul (production in 2011),' polyester yarns, by recycling collected waste PET bottles (as the results of LCA, approximately 66.5 % of CO2 emissions compared to a regular yarn) - Recycled spandex: 'Creora Regen,' a spandex yarn by recycling by-products in the production process (as the results of LCA calculation, approximately it reduced 66.8 % of CO2 emissions compared to a regular yarn) Hyosung TNC, as one of members in charge of responding to climate change, makes continuous efforts to respond to climate change by registering Bio-Based Spandex in MIS (Material Sustainability Index) of 'Higg Index,' an index for environmental impact assessment developed by SCA (Sustainable Apparel coalition), It consistently implements development and sales of low-carbon based products. - Spandex using bio-based materials: a yarn from non-edible grain corn as raw materials - Eco-friendly textiles applying Mipan Regen: development of textiles using 'Mipan Regen' as a yarn The research funds supporting for eco-friendly product development annually rises and Hyosung TNC invested approximately KRW 2.6 billion in R&D in 2021. The research funds were invested in the following developments: spandex biodegraded by microorganism in landfilling (approximately KRW 450 million), cosmetic fiber products for innerwear and (approximately KRW 650 million), etcetera.
Supply chain and/or value chain	Yes	To construct the sustainable cooperative system, it is necessary for the 'suppliers' is an upstream and client company 'downstream' in the value chain to manage joint risks (related to climate change) and implement the joint risks management (related to climate change) for the need. (Upstream) They 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 TNC 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. After diagnosis of process and workplace environment was conducted, Hyosung TNC specified a factor to reduce annually energy by 39toe and GHG emissions equivalent to with 78.3tCO2. - Establishment of behavior rules for the suppliers: From the supplier selection phase to management, Hyosung TNC regularly reflected the criteria which includes not only quality, price, management performance but also environment, safety, regal requirements in evaluation items to establish behavior rules. Because the later criteria could be risks related to climate change. (Downstream) Hyosung TNC discloses information on products which acquired eco-friendly certifications and the results of carbon emission calculation of products which reduced carbon emissions in the production process. It develops and supplies customized low-carbon products for client company's demand. Hyosung TNC realizes green management through risk management of climate change and active responses to fulfill its own responsibility for environmental management and sustainable partnership with all stakeholders in the value chain. - To provide quantitative and qualitative information on climate change responses, Hyosung TNC acquired and maintains GRS Certification of spandex (Creora Regen), nylon (Mipan Regen) and polyester (Regen) and conducted LCA of 2 spandex products (Bio Based Spandex, Regen Spa) and recycled polyester. - Recycled polyester using sea plastics, Hyosung TNC acquired OBP Certification, and annually renews OEKO-TEX® STANDARD 100 Certification.
Investment in R&D	Yes	As the endeavor for GHG reduction and sustainable development like developing products using eco-friendly materials globally rises, client companies increasingly demand for more use of sustainable raw materials, development of low-carbon products and compliance with eco-friendly policy. Starting from recycled nylon products for the first time in the chemical fiber industry in 2007, Hyosung TNC succeeded in developing of recycled polyester and recycled spandex. It annually plans the budget for continuous development of eco-friendly products and implements R&D of recycled products and low-carbon products. The executed R&D cost was a total of KRW 10.857 billion in 2021. Cost for Eco-friendly research tasks was KRW 2.608 billion to account for approximated 24% in the total cost. The major eco-friendly research tasks were like the following: 'Bio-degradable yarn development,' 'PET Mechanical Recycle White dyed yarn development' and 'NY industrialization of technology for Chemical Recycle,' etcetera. Hyosung TNC has annually expanded the investment. The ration of eco-friendly was 6 % in 2019, 11 % in 2020 and 24 % in 2021 compared to the investment costs for all tasks. - 'Development of Bio-degradable yarn': Development of spandex biodegraded by microorganisms in landfilling - 'Development of dyed yarn for PET Mechanical Recycle White': Replacing the existing piece dyed products with eco-friendly Recycle white dyed yarn to reduce wastewater from dyeing processing - 'Industrialization of technology for NY Chemical Recycle': Hyosung TNC 'Mipan Regen Ocean' products, a recycled nylon, through technology to raise purity degree after excluding impurities from collected waste fishing nets. Based on 2021 base year, Hyosung TNC set the goal to raise its market shares twice until 2025 and plans to implement continuous R&D. Hyosung TNC continuously conducts R&D to manufacture eco-friendlier and various eco-friendly products by expanding the product range through its leading technology in the eco-friendly fiber market. It allocated approximately KRW 1.765 billion of the budget to R&D of eco-friendly technology in 2022.
Operations	Yes	Hyosung TNC pointed out 'circular economy,' 'carbon reduction,' 'health and safety' and 'Win Win Growth' as the 4 important keywords for sustainable management in the reporting year. Workplaces set the long-term target to achieve 14.5 % carbon reduction by 14.5 % by 2030 compared to 2018 to realize 'carbon reduction'. Hyosung TNC drives a facility investment plan for GHG emissions reduction (replacement into highly efficient facilities and LED with lower electricity consumption, prevention activities of energy losses) in each workplace and reduction activities to achieve the target. It will plan to reduce carbon emissions annually by 493tCO2eq. Hyosung TNC independently allots a budget for investment in environmental facilities. In 2021, it made a plan of GHG emission reduction (replacement of old facilities, supplement of facilities by introducing highly efficient facilities and so on) through process improvement in manufacturing plants. The board of directors finally approved a total of KRW 555 million of investment cost and KRW 506 million was executed. - Energy reduction due to introduction of highly efficient facilities: Gumi, Gwangju Frozen Storage Warehouse, Ulsan Plant - Conversion into fuels with low GHG emissions per thermal unit: Company-widely applied - Replacement of steam with unused waste heat: Ulsan and Gumi Plant - Process improvement and operation optimization for energy reduction: Company-widely applied - Constructing smart energy platform: for efficient energy management: Daegu Plant (participation in the reporting year, plans to discover and to manage energy reduction factors through installation of 20 measuring instruments into electric power facilities using large rated power and construction of energy management system (FEMS)) Additionally Hyosung TNC manages physical risks (typhoons, floods, etcetera) due to climate change as important risks. Hyosung TNC established management regulations for emergency in each plant to minimize physical impacts on workplaces due to physical risks and implements internal safety inspection (emergency response training, driving improvements, etcetera) every month according to the relevant regulation. Gumi Plant carried out safety inspection and implemented facility maintenance in a total of 610 cases. It will plan to conduct preemptive facility inspection and emergency response training hereafter.

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	Direct costs	To respond to the main changes in the industrial structure of the fiber materials industry, a representative of industries, Hyosung TNC drives portfolio changes in business area. When promoting these portfolio changes, Hyosung TNC set "Clean Environmental Energy Society" and "Product Development for Customers" as the goals and responds to climate change by focusing on R&D in priority sectors. Hyosung TNC leads to develop eco-friendly technologies by positively investing in R&D as such a response, reduces GHG emissions by introducing smart factory technology and simultaneously constructs safe and efficient working environments. Particularly, Hyosung TNC annually increases investment cost and ratio to develop eco-friendly technology. Hyosung TNC executed 24 % of R&D cost to implement eco-friendly tasks based on 2021 base year.

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)

101501.7

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

305124.26

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)

406625.96

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]

347665.1958

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

94751.32

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

270385.12

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)

365136.44

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

70.3680160237815

Target status in reporting year

Replaced

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

Target ambition

<Not Applicable>

Please explain target coverage and identify any exclusions

Hyosung TNC 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.

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

<Not Applicable>

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 CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	0	0
Implementation commenced*	3	362
Implemented*	1	6
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	Compressed air
---	----------------

Estimated annual CO2e savings (metric tonnes CO2e)

6

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)

3945700

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

9000000

Payback period

1-3 years

Estimated lifetime of the initiative

11-15 years

Comment

Gumi Plant applied Q6-2 radiant heat per P/P Inv. to make electricity consumption lessen and that resulted in GHG emission (Scope2) reduction.

C4.3c

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

Method	Comment
Compliance with regulatory requirements/standards	Hyosung TNC annually appropriate investment cost for GHG emission reduction and higher energy efficiency. This investment cost includes facility efficiency and maintenance activities in each workplace like the following: facility replacement, energy source change and energy efficiency including process improvement. Particularly, GHG emissions due to electricity use accounts for approximately 90 % of overall emissions. Hyosung TNC concentrates on activities for electricity use reduction.

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

Product or service

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 (Product produced using waste PET bottles)
------------------------	--

Description of product(s) or service(s)

Hyosung TNC succeeded in developing recycled nylon, polyester and spandex for the first time in the chemical fiber industry. Hyosung TNC carried out LCA of the polyester yarn 'Regen' recycling waste PET bottles as raw materials. Then it adopted ISO 14067 Greenhouse gases - carbon footprint method. In addition, it confirmed the reduction effect on carbon emission in the production process through comparison to general goods. [Polyester yarn 'Regen' recycling waste PET bottles as raw materials] Hyosung TNC produces eco-friendly polyester yarn, Regen through the technology for recycling waste PET bottles like extracting effective ingredients from waste PET bottles for the first time in Korea in 2008. Using 100 % recycled materials in the production process, Regen has two effects. Landfill amount dramatically declines, and carbon emission also decreases. Recognizing such eco-friendliness, Dutch Control Union, a global eco-friendly certification agency, issued Hyosung TNC the GRS (Global Recycle Standard) Certification for the first time in the fiber industry recycling polyester in the world. Hyosung TNC annually passes verification of quality and production process to renew the certification. In the reporting year, Hyosung TNC conducted LCA of the relevant product to calculate carbon emission in the production process. The results confirmed that Regen (recycled PET) has an effect to reduce carbon emission by approximately 66.5 % compared to general Regular PET.

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

Yes

Methodology used to calculate avoided emissions

Other, please specify (ISO 14067 Greenhouse gases - carbon footprint)

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

Cradle-to-gate

Functional unit used

kgCO2/kg (carbon emission per kg from production)

Reference product/service or baseline scenario used

Polyester Regen was used to calculate avoided emissions of general products (general products using no recycled materials) with the same function and role. [Polyester Regen] Hyosung TNC calculated carbon emission in the production process of general yarn per kg using general Regular PET and carbon emission in the production process of polyester regen per kg using 100 % recycled PET. The results confirmed eco-friendliness of 'polyester regen.'

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

Cradle-to-gate

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

1.842

Explain your calculation of avoided emissions, including any assumptions

Polyester Regen referenced products of each product based on an international standard, ISO 14067 Greenhouse gases - carbon footprint methodology to implement LCA of products with specialization coefficient of IPCC 2013. The products are 'production goods (intermediate goods)' and conducted LCA including the preproduction stage and the production stage according to ISO 14067. [Polyester Regen] In the general Regular PET case, carbon emissions in all production stages (the preproduction stage and the production stage) were calculated as approximately 2.772kgCO2/kg. And in the polyester Regen case, carbon emissions in all production stages (the preproduction stage and the production stage) were calculated as approximately 0.930kgCO2/kg. The calculations confirmed the effect to reduce carbon emission by approximately 1.842kgCO2 (66.5%) when manufacturing 1 kg compared to the existing regular products. Particularly, the reduction ratio of carbon emission was highest in the preproduction stage because of using recycled materials. Hyosung TNC.

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

0.04

Level of aggregation

Product or service

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 (goods recycling by-products)
------------------------	---

Description of product(s) or service(s)

Hyosung TNC succeeded in developing recycled nylon, polyester and spandex for the first time in the chemical fiber industry. Hyosung TNC named Recycled nylon as 'Mipan Regen (developed in 2007),' recycled polyester as 'Regen (developed in 2008)' and recycled spandex as 'Creora Regen (developed in 2019).' It released low-temperature setting 'Creora Eco-Soft (in 2014).' Among them, Hyosung TNC carried out LCA of the Creora Regen' using recycled spandex yarns as raw materials. [Recycled spandex yarn 'Creora Regen'] Hyosung TNC developed a technology to reuse waste yarn in the manufacturing process of spandex as materials. This technology allows it produce 'Creora Regen,' a 100 % recycled spandex and a yarn using recycled waste. As manufacturing recycle spandex, Hyosung TNC became the newer company to produce eco-friendly yarn recycling all polyester, nylon and spandex. The eco-friendliness of the relevant products was recognized that Hyosung TNC acquired the GRS Certification from Dutch Control Union. The results of LCA implementation in the reporting year confirmed that Creora Regen (recycled spandex) has an

effect to reduce carbon emission by approximately 66.8 % compared to general spandex.

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

Yes

Methodology used to calculate avoided emissions

Other, please specify (ISO 14067 Greenhouse gases - carbon footprint)

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

Cradle-to-gate

Functional unit used

kgCO2/kg (carbon emission per kg from production)

Reference product/service or baseline scenario used

Creora Regen was used to calculate avoided emissions of general products (general products using no recycled materials) with the same function and role. [Creora Regen] Hyosung TNC calculated and compared carbon emission in the production process of general spandex per kg and carbon emission in the production process of spandex Creora Regen per kg using 100 % waste yarn from the production process. The results confirmed eco-friendliness of 'Creora Regen.'

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

Cradle-to-gate

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

5.869

Explain your calculation of avoided emissions, including any assumptions

Creora Regen and all referenced products of each product based on an international standard, ISO 14067 Greenhouse gases - carbon footprint methodology to implement LCA of products with specialization coefficient of IPCC 2013. The products are 'production goods (intermediate goods)' and conducted LCA including the preproduction stage and the production stage according to ISO 14067. [Creora Regen] The LCA results of general regular spandex confirmed carbon emission was approximately 8.776kgCO2/kg in the production process. When applying the same calculation methodology and calculation coefficient to LCA, the LCA results of Creora Regen derived the result value as approximately 2.907kgCO2/kg. In other words, Creora Regen has the effect to reduce carbon emission by approximately 5.869kgCO2 (approximately 66.8%) in the production process of Creora Regen per kg compared to general regular spandex with the same function. Creora Regen reuses waste (waste thread) in the production process. The emission reduction effect was highest in the preproduction stage.

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

0.09

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?

No

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

<Not Applicable>

Details of structural change(s), including completion dates

<Not Applicable>

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	Hyosung TNC additionally calculated emissions of Scope 3 category 8 (Upstream leased assets) and category 15 (Investments) in the reporting year. Hyosung TNC calculated emissions of 9 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 - 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 operations acquired or divested did not exist in the base year	Hyosung TNC is a company regulated by Korean ETS. It should comply with 'the Administrative Guideline for the Greenhouse gas Target Management System. 'The Guideline defined the criteria of emissions recalculation in a base year as the following. (Emissions recalculation policy a base year) - when cause of rights and duties succession occurs such as merge, division and operating assets transfer - when change in GHG emission source or absorption source occurs inside and outside the organizational boundaries - change in calculation methodology for GHG emissions When conforming to the relevant guideline, Hyosung TNC calculated emissions in a base year and then reported it to Ministry of Environment. But emissions were not recalculated because it did not conform to the recalculation criteria in a base year. Hyosung TNC added Scope 3 emission calculation category to calculate emissions in the reporting year. CDP 2021 had 7 categories but, emissions in the additional 2 categories in the reporting year were calculated. Hyosung TNC calculated emissions in the 9 categories in total and implemented the CDP reporting. Scope 3 emission data, however, is not managed yet so that Hyosung TNC 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)

101501.7

Comment

Hyosung TNC sets the target for all domestic workplaces to reduce 14.5 % by 2030 compared to 2018. Hyosung TNC's Scope 1 emissions in total in a base year (2018) were calculated as '101501.70 tCO2eq'.

Scope 2 (location-based)

Base year start

January 1 2018

Base year end

December 31 2018

Base year emissions (metric tons CO2e)

305124.26

Comment

Hyosung TNC sets the target for all domestic workplaces to reduce 14.5 % by 2030 compared to 2018. Hyosung TNC's total Scope 2 emissions in a base year (2018) were calculated as '305124.26tCO2eq'.

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

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year, In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 2: Capital goods

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year, In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

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

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year, In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 4: Upstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year, In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 5: Waste generated in operations

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year, In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 6: Business travel

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year, In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 7: Employee commuting

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year, In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 8: Upstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year, In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 9: Downstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year, In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 10: Processing of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year. In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 11: Use of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year. In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

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

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year. In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 13: Downstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year. In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 14: Franchises

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year. In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3 category 15: Investments

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year. In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year. In the future, we plan to set Socpe 3 base year and reduction targets through more reliable data management.

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

0

Comment

The calculated result value of Scope 3 emissions does not exist in 2018 and emissions calculation began from 2019. Currently, Scope 3 emission data is not yet managed at a complete level, so it has not been set for the base year. In the future, we plan to set Scope 3 base year and reduction targets through more reliable data management.

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)

94751.32

Start date

<Not Applicable>

End date

<Not Applicable>

Comment

Hyosung TNC's total scope 1 emissions in the reporting year were calculated as '94751.320 tCO2eq.'

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

270385.122

Scope 2, market-based (if applicable)

<Not Applicable>

Start date

<Not Applicable>

End date

<Not Applicable>

Comment

Hyosung TNC's total Scope 2 emissions in the reporting year were calculate as '270385.122 tCO2eq'.

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)

1819737.38

Emissions calculation methodology

Average data method

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

0

Please explain

Hyosung TNC included the annual main raw materials (TPA, MEG, CPL, PTMG, etcetera) and water used in all domestic workplaces into the range of emission calculation. Based on the annual purchase amount, the upper 98.7 % of the relevant items was calculated. Activity data (amounts of purchasing products) adopted the real purchase amount data managed in a system and emission coefficient employed primarily the national LCI DB of Ministry of Environment by purchased raw material and was calculated by using foreign LCI DB (ecoinvent) when no local DB exists. - Emission calculation: $\sum (\text{yearly amount of purchasing raw materials (kg)} \times \text{GHG emission coefficient (kgCO}_2\text{-eq) by raw material})$ Hyosung TNC conducted the third-party verification to raise credibility in emissions calculation in the relevant category.

Capital goods

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

6.09

Emissions calculation methodology

Average data method

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

0

Please explain

Hyosung TNC calculated emissions due to the purchase of 'printers, all-in-one printers, personal computers, monitors and main computers' in the reporting year (2021). Activity data adopted the real purchase amount data managed in the internal capital goods purchase data, and emission coefficient was calculated by using the result value of carbon emissions in 'the preproduction stage,' and 'production stage' of all stages by product - Emission calculation: $\sum (\text{purchase amounts of printers, all-in-one printers, personal computers, monitors (ea)} \times \text{an individual GHG emission coefficient (kgCO}_2\text{-ea) by product})$ Hyosung TNC conducted the third-party verification of GHG emissions in the capital goods category calculated in the relevant process.

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

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

41681.39

Emissions calculation methodology

Average data method

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

0

Please explain

Hyosung TNC calculated emissions in the production process using purchased fuel in the reporting year (2021) and emissions due to electricity losses (electricity transmission and distribution) in the distribution process. Activity data adopted the detailed statement data managed in a system and emission coefficient employed upstream emission coefficient by material. - Emission calculation: $\sum (\text{annual fuel usage} \times \text{GHG emission coefficient by year})$ Based on 'mean-data calculation method' of emission calculation methodology, emissions were calculated by item, and the final total was calculated as emissions in the relevant category. Hyosung TNC conducted the third-party verification of GHG emissions in the relevant process.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

17663.28

Emissions calculation methodology

Distance-based method

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

0

Please explain

Hyosung TNC calculated emissions in the transportation process of purchased raw materials for production in the reporting year (2021). Activity data adopted data on the purchase amount, addresses of suppliers (transportation distance) and means of transportation (trucks, ships, etcetera) in the internal purchase system and emission coefficient employed emission coefficient per unit distance by means of transportation in Environmental Product Declaration of Ministry of Environment - Emission calculation: \sum (annual transportation distance (km) X supply and demand amounts (ton) X GHG emission coefficient by means of transportation (kgCO₂/ton.km) Based on 'distance-based calculation method' of emission calculation methodology, emissions were calculated by item, and the final total was calculated as emissions in the relevant category. Hyosung TNC conducted the third-party verification of GHG emissions in the relevant process.

Waste generated in operations

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

8660.61

Emissions calculation methodology

Waste-type-specific method

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

0

Please explain

Hyosung TNC calculated waste in the management process of its own and operational facilities and emission in the 3rd party entrustment processing process in the reporting year (2021). Activity data adopted data on the reported waste amount (waste emission) which each workplace reported in the government's reporting system, waste type and processing method were checked in entrustment processing. Emission coefficient used the emission coefficients by waste type and processing method from LCI DB of Ministry of Environment - Emission calculation: \sum (annual waste emission (kg) X GHG emission coefficient by waste processing method (kgCO₂/kg) Based on 'calculation method using data by waste type' of emission calculation methodology, emissions were calculated by item, and the final total was calculated as emissions in the relevant category. Hyosung TNC conducted the third-party verification of GHG emissions in the relevant process.

Business travel

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

111.1

Emissions calculation methodology

Fuel-based method
Distance-based method

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

0

Please explain

Hyosung TNC calculated emissions in the overseas and domestic business travels of executives and staff members in the reporting year (2021). Activity data adopted data on the record of overseas and domestic business travels (number, place, transportation, expenses) in the system in each workplace. Data on business travel expenses was converted into fuel usage, distance movement amount, movement number, etcetera, and the relevant emission coefficient (1person.km, kg-CO₂/number, etc.) was applied. - Emission calculation: \sum ((\sum (overseas business travel distance by employee/fuel usage in business travel X business travel number) X GHG emission coefficient by means of transportation (kg-CO₂/person.km)/(kgCO₂/L) / (kgCO₂/number) Hyosung TNS used 'Distance based calculation method' and 'fuel-based calculation method' simultaneously. Based on emission calculation methodology, it calculated emission by item. The final total off emissions due to overseas and domestic business travel was calculated as emissions in the relevant category. Hyosung TNC conducted the third-party verification of GHG emissions in the relevant process.

Employee commuting

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

Most domestic workplaces of Hyosung TNC run commuter buses for employees included in Scope 1 already. The commuter bus was excluded from the range of emission calculation because there is no need to separately calculate emission in the relevant category.

Upstream leased assets

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

50.75

Emissions calculation methodology

Average data method

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

0

Please explain

Hyosung TNC calculated emissions from long-term rent vehicles in the reporting year (2021). Activity data applied the purchase data managed in the internal data on purchase capital goods in the system. emission coefficient used the result value of carbon emission in 'the preproduction stage' and 'the production stage' in the whole production states by product. Some purchased products without carbon emission coefficient applied emission coefficient of the similar model. - Emission calculation: \sum (long-term rent vehicles (ea) X GHG emission coefficient by vehicle type (kgCO2/kg) Based on 'calculation method using mean-data' of emission calculation methodology, emissions were calculated by item, and the final total was calculated with emissions in the relevant category. Hyosung TNC conducted the third-party verification of GHG emissions in the relevant process.

Downstream transportation and distribution

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

27517.15

Emissions calculation methodology

Distance-based method

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

0

Please explain

Hyosung TNC calculated emissions in the transportation process of all products sold in the domestic workplaces in the reporting year (2021). Activity data applied data on product sales, addresses of client companies (transportation distance) and means of transportation (trucks, ships, airlines, etcetera) in the internal ERP system, and emission coefficient used emission coefficient per unit distance by means of transportation in Environmental Product Declaration of Ministry of Environment - Emission calculation: \sum (annual transportation distance of sold products (km) X amount of sold products (ton) X GHG emission coefficient by means of transportation (kgCO2/kg) Based on 'distance-based calculation method' of emission calculation methodology, emissions were calculated by item, and the final total was calculated with emissions in the relevant category. Hyosung TNC conducted the third-party verification of GHG emissions in the relevant process.

Processing 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

Hyosung TNC's products are fiber yarns (spandex, nylon, polyester, etcetera) belonging to intermediate materials, and the end products (shoes, clothes, bags, etcetera) are manufactured through the various stages. The additional processing process of sold products varies and suppliers operate different processing process from each other. Considering these situations, it is difficult to assume emissions in the relevant category. Additionally, the additional processing process of sold products is considered to be difficult to implement GHG reduction activities through Hyosung TNC's influence. So, it is a category with relatively so low relevancy. In this case, it belongs to the exclusion based on section 6.4 "corporate value chain (scope 3) accounting and reporting standard" of GHG Protocol. So, Hyosung TNC did not report GHG emissions in the production process of sold products

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

Hyosung TNC manufactures fiber yarns (spandex, nylon, polyester, etcetera), intermediate materials. They are used as raw materials for various products such as clothes, bags and shoes. The sold products go through many stages in upstream in the value chain. Therefore, various end products are manufactured. It is considered to belong to 'sold intermediate products are unknown' in the GHG Protocol. In this case, it is difficult to reasonably predict emission from the end users. Therefore, the emission should be excluded from the GHG calculation in each product's using stage because the final products are various and different from each other in hours of use and life.

End of life treatment 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

Hyosung TNC's fiber yarns are intermediate materials. They are finally used to manufacture clothes, shoes and bags. In Korea, sold products such as clothes, bags and shoes are discarded not by each family, but through nearby collection boxes for clothes. The collected clothes through the collection boxes go through sorting process and are exported as secondhand clothes. As the sold products are recycled after collecting through companies and export, it is difficult to calculate emissions in the disposal process of products. In this case, it belongs to the exclusion based on section 6.4 "corporate value chain (scope 3) accounting and reporting standard" of GHG Protocol. So Hyosung TNC did not report GHG emissions in the final disposal process of sold products.

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 TNC does not operate downstream leased assets, so it is impossible to calculate emissions for 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

Due to the characters of the business, we do not own franchises, so cannot calculate emissions for this category.

Investments

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

873934.03

Emissions calculation methodology

Investment-specific method

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

100

Please explain

Hyosung TNC calculated GHG emissions which are not belonging to Scope 1 & 2 in the reporting year (2021). Activity data used data on collected actual fuel usage. To calculate Scope 1 & 2 emission data of investment companies, Hyosung TNC collected actual fuel usage and then calculated GHG emission (Scope 1 & 2). - Emission calculation: \sum (annual Scope 1 & 2 emissions of an investment company X ratio share of a reporting company (%)) Based on 'calculation method using actual investment data' of emission calculation methodology, emissions were calculated by item, and Hyosung TNC conducted the third-party verification of GHG emissions in the relevant 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?

Yes

C6.7a

(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment
Row 1	1803	Emissions occurred in Ulan Plant by 1,584tCO2 and in Gumi Plant 219tCO2. The annual emissions were a total of 1,803tCO2 due to biogas usage.

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

8e-8

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

365136.44

Metric denominator

unit total revenue

Metric denominator: Unit total

4560800000000

Scope 2 figure used

Location-based

% change from previous year

28.57

Direction of change

Decreased

Reason for change

Hyosung TNC set sales as a denominator and GHG emissions as a numerator. GHG emissions per KRW declined compared to the last year. The reasons are as follows: 1. (denominator) sales, a denominator, increased by approximately 45 % in 2021 compared to 2020. 2. (numerator) GHG emissions (Scope 1 +2) increased by approximately 13 % in 2021 compared to 2020. GHG reduction activities lessened Scope 2 GHG emissions by approximately 6ton. Although Hyosung TNC invested a total of KRW 506 million to implements various facility improvement and GHG reduction activities, quantified data on the reduction amount by reduction activity is absent because it is difficult to quantify the amount of GHG reduction before and after facilities improvement. In other others, the total reduced emissions would increase largely because Hyosung TNC implemented various reduction activities aside from GHG emissions (6tCO2) through actually recognizable reduction activities. Also, the rise in product price in the reporting year affected the decline in GHG emissions per KRW based on sales. A total of emissions per KRW decreased due to these situations.

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	94148.43	IPCC Second Assessment Report (SAR - 100 year)
CH4	543.42	IPCC Second Assessment Report (SAR - 100 year)
N2O	59.48	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	94751.32

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 Sources	94314.38
Mobile Combustion	436.941

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	270385.122	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	263866.882	0
Steam	6518.24	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	1802.702	Decreased	0.56	In Hyosung TNC, consumption of renewable energy increased in 2021 and emissions decreased by approximately 1802.7tonCO2. Therefore, variable ratio of emissions was $\{(1802.702/323539.652) \times 100\} = 0.56\%$.
Other emissions reduction activities	6	Decreased	0.002	Hyosung TNC reduced a total of 6tCO2 through GHG reduction projects in 2021. The ratio of 6ton compared to GHG Scope 1 + 2 emissions = 323,539.652 in 2020 was confirmed as approximately 0.002 %. This was calculated like the following: $\{(6/323539.652) \times 100\} = 0.002\%$.
Divestment	0	No change	0	No change due to divestment in 2020 and 2021.
Acquisitions	0	No change	0	No change due to acquisitions in 2020 and 2021.
Mergers	0	No change	0	No change due to mergers in 2020 and 2021.
Change in output	36273	Increased	11.21	Hyosung TNC calculated changes in GHG emission in the facilities (Daegu Plant, Ulan Plant, Gumi Plant) directly related to production activities among the domestic workplaces. The emission of GHG Scope 1 + 2 from the production activities in 3 workplaces in 2020 was a total of 324,026tCO2, and GHG emission based on the same criteria was a total of 360,299tCO2 in 2021. It means GHG emission increased by a total of 36,273tCO2. As Hyosung TNC's production increases in 2021 compared to 2020, GHG emissions also increased. The change ratio of emission was $\{(36273/323539.652) \times 100\} = 11.21\%$.
Change in methodology	0	No change	0	No change due to calculation methodology change in 2020 and 2021.
Change in boundary	0	No change	0	No change due to change in boundary in 2020 and 2021.
Change in physical operating conditions	0	No change	0	No change due to change in physical operating conditions in 2019 and 2020.
Unidentified	0	No change	0	No change due to unidentified activities in 2019 and 2020..
Other	7145.492	Increased	2.21	GHG emissions increased by a total of 41,596.79tCO2 in 2021 compared to 2020. Hyosung TNC partly reduced GHG emission through renewable energy consumption and reduction activities, but GHG emission partly increased due to a rise in production. (Various reduction activities were carried out, but understandable reduction activity through quantified data on before and after the amount of reduction is one activity. It reported only approximately 6tCO2 of reduction.) And Hyosung TNC confirmed GHG emissions partly increased due tow warehouses, building management, etcetera. Namely, besides activities showing understandable change in emissions, numerous factors affected partly increase or decrease in emissions. (Confirmed the increase through change in total GHG emissions in 2020 and in 2021) The change ratio of emissions was $\{(7145.492/323539.652) \times 100\} = 2.21\%$

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	No

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)	10077.79	483717.05	493794.84
Consumption of purchased or acquired electricity	<Not Applicable>		574311.94	574311.94
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>		293229.12	293229.12
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total energy consumption	<Not Applicable>	10077.79	1351258.12	1361335.91

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	No
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

HHV

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

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Other biomass

Heating value

HHV

Total fuel MWh consumed by the organization

10077.79

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Other renewable fuels (e.g. renewable hydrogen)

Heating value

HHV

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

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Coal

Heating value

HHV

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

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Oil

Heating value

HHV

Total fuel MWh consumed by the organization

4961.12

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Gas

Heating value

HHV

Total fuel MWh consumed by the organization

478755.94

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

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

Heating value

HHV

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

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Total fuel

Heating value

HHV

Total fuel MWh consumed by the organization

493794.85

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

<Not Applicable>

Comment

Since Hyosung TNC uses fuel for transportation, industrial processes, and facilities, it is only consuming fuel for the generation of heat.

C8.2g

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

Country/area

Republic of Korea

Consumption of electricity (MWh)

574311.94

Consumption of heat, steam, and cooling (MWh)

293229.12

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

867541.06

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

Other, please specify

Metric value

Metric numerator

.

Metric denominator (intensity metric only)

.

% change from previous year

0

Direction of change

No change

Please explain

Hyosung TNC has no additional indicators.

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

AS_GHG_Hyosung TNC_EN2021.pdf

Page/ section reference

1page

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

AS_GHG_Hyosung TNC_EN2021.pdf

Page/ section reference

1page

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

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

AS_GHG_00000_Er_2021_TR.pdf

Page/section reference

page 1~2

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?

No, but we are actively considering verifying within the next two years

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

416524

Allowances purchased

0

Verified Scope 1 emissions in metric tons CO₂e

94751.32

Verified Scope 2 emissions in metric tons CO₂e

270385.12

Details of ownership

Facilities we own and operate

Comment

The Korean government operates 'GHG Emission Trading Scheme' for the national target of GHG reduction target. Hyosung TNC is also a subject of ETS and regulated by the relevant regulations. The government allocates GHG allocation to Hyosung TNC. It annually reports emissions and apprehends the current situation of deficiency. Hyosung TC's GHG allocation and actual emission in the reporting year are as follows. - GHG emission allocation of Hyosung TNC in 2021: 416524ton - GHG emissions of Hyosung TNC in 2021: 365136.442ton Hyosung TNC emits lower GHG than allocation through various reduction activities in the reporting year. It does not purchase additional allowances.

C11.1d

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

As Hyosung TNC is a subject of the government's GHG ETS, it promotes three strategies for analyzing risks and opportunities.

1) Establishment of GHG reduction strategies and enhancing governance

In Korea, Carbon Neutrality Act was enacted to follow Korea's 2050 Carbon Neutrality Policy. As the industrial sector target of the National Greenhouse Gas Reduction Target (NDC) improved, Hyosung TNC also updated the GHG target from 20.5% reduction compared to 2017 emission to 14.5% reduction compared to 2018 emission in order to meet announced new NDC. Hyosung TNC also revised the target in the Green Management Vision 2030 to '14.5% emissions reduction by 2030 compared to 2018' and reestablished reduction plans such as process improvement and facilities replacement in each PU (Project Unit).

In addition, Hyosung TNC newly established 'the ESG Management Committee' to deal with climate change issues to promote actively ESG management in the reporting year. The CEO is the chairperson to run the committee as the board-level influencing body. It discussed the following agenda: company-wide responses to climate change, monitoring risks and opportunities in climate change, monitoring and assessment of environmental effect, etcetera. The ESG Management Committee made direct decision about the agenda to deal with ETS issues (analysis of the expected emissions and deficiency in allowances)

2) Monitoring and sharing the trends of K-ETS policy

Hyosung TNC regularly communicates with diverse stakeholders (government and Ministry of Environment, industry associations, etcetera) to apprehend the trend of policy about 'emissions trading scheme.' Hyosung TNC actively participates in many public hearings about the ETS management and operation to communicate with the government and Ministry of Environment, to understand the trends and to present its opinion. Issues relating to various system comes in these processes. The ESG Management Committee adopts the issues as an agenda at the regular meeting and the issues are company-widely shared.

Hyosung TNC as a participant in ETS implements management of and monitoring detailed data on energy usage and GHG emissions and reports the relevant data to Ministry of Environment after the third-party verification.

3) Establishing GHG reduction plan, implementing reduction activities and measuring performance

GHG allocation is annually allotted to Hyosung TNC. It established and managed the detailed reduction target in each plant to achieve it. Hyosung TNC uses the internal carbon price of the reporting year to set the target in each plant by reflecting carbon cost through economic analysis when it makes reduction targets such as facility investment and fuel conversion to reduce GHG emissions.

Hyosung TNC actively implements GHG reduction activities to achieve the reduction target and also conducts performance analysis of achievements and reductions through regular monitoring. The details of GHG reduction performance are managed as annual KPI of each plant manager and employee. Based on KPI, Incentives are given. GHG reduction activities are actively and company-widely implemented.

In addition, each PU monitors and apprehends annual allowances and expected deficiency to confirm emissions allocation and achievements and then reports to the board of directors.

Gumi Plant of spandex PU implemented a GHG reduction activity through energy reduction, 'reduction in electricity costs through the application of a radiant heat pump inverter' in 2021.

C11.2

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

No

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
Identify and seize low-carbon opportunities

GHG Scope

Scope 1
Scope 2

Application

Hyosung TNC has used the internal carbon price system when reviewing new expansion of workplaces and facility investment and applies it to active decision-making. It understands validity of investment through additional analysis of carbon costs according to GHG emission with economic analysis of the existing business by introducing the internal carbon price system. Also, Hyosung TNC as a workplace of ETS uses it for GHG reduction and management of deficiency in allowance. Hyosung TNC uses the internal carbon price system for strategic decision-making, additionally intends to specify risks and opportunities in the process of transition to a low-carbon economy and then finally to minimize risks and to utilize opportunities through management of the internal carbon price system.

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

31000

Variance of price(s) used

Hyosung TNC operates the internal carbon price. This price is set as the same price to the KAU emissions trading amount and is applied to all domestic workplaces. To set the internal carbon price, Hyosung TNC annually analyzes the carbon trading market. When establishing management strategy, the results are shared company-widely by the decision of the strategic headquarter and the board of directors To expand it in the future, Hyosung TNC plans to conduct a systemic scenario analysis and to construct a pricing mechanism of the internal carbon price considering factors such as markets, prices and time.

Type of internal carbon price

Implicit price

Impact & implication

Hyosung TNC set the target to reduce GHG emissions by 14.5 % by 2030 compared to 2020 and will achieve it through various GHG reduction activities. Hyosung TNC analyzes carbon cost based on GHG emissions by using the internal carbon price in the plan establishing stage of energy facility investment and in the validity review stage of new business development in all domestic workplaces. 1. Hyosung TNC calculated energy reduction and carbon emissions through facility investment (facility replacement, fuel conversion, process improvement, etcetera), applied the internal carbon price for conversion into quantified value. It reflects the value in economic assessment. 2. Hyosung TNC uses it in investment review and in expense report for facility investment and then applies it as a criterion for economic assessment affecting the final decision-making. In addition, Hyosung TNC developed and uses a calculation tool for GHG emission to introduce the internal carbon price smoothly. The internal carbon price is used for purchasing cost analysis and responses except for the GHG reduction target. Hyosung TNC implemented economic assessment through the internal carbon price when replacing facilities in workplaces and energy conversion in the reporting year. As the result, it drew energy and GHG reduction in facility replacement (applying radiant heat pump inverters) in Gumi Plant and it also deduced the results of economic effect (Converting GHG reduction due facility replacement into the internal carbon price, KRW 31000 per ton. Provided the effect of the relevant facility replacement continues in the next 15~20 years, it brings about KRW 11 million or more.). Hyosung TNC, therefore, carried out an analysis of economic effect. The decision-making based on the economic factor analysis led to replacement of the relevant facilities to reduce GHG emissions by approximately 6tCO compared to 2020.

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

Directly work with suppliers on exploring corporate renewable energy sourcing mechanisms

% of suppliers by number

0.01

% total procurement spend (direct and indirect)

0.64

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

0

Rationale for the coverage of your engagement

Hyosung TNC promotes ESG management to minimize environmental impact and to complete circular economic model. It implements green management through 'development and sale of eco-friendly products,' a promotion work. For production and sale of eco-friendly products, Hyosung TNC thinks that carbon emissions reduction should be implemented in upstream (supply chain) in the value chain as well as through process improvement and recycling materials in its own workplaces. Hyosung TNC, therefore, conducts diverse engagement such as improving environmental characteristics of suppliers' products by sharing green purchase guidelines for supply chain and energy partnership programs for win-win growth with suppliers. Hyosung TNC implemented an energy partnership program with ECOTECH RM, an engagement activity, in the reporting year. The energy partnership program as an engagement activity organized an advisory group for energy management innovation. The advisory group set a goal of process improvement and energy reduction in the relevant company through production process in supply chain and understanding of the current situation, field diagnosis, technical training and authoring reports about diagnosis results. (Criteria for supplier selection) Among raw materials which Hyosung TNC purchases, it selected suppliers who manufacture eco-friendly raw materials. It also applied Environmental Management System (ISO 14001 Certification) as selection criteria. Considering the relevant selection criteria, Hyosung TNC selected ECOTECH RM as an engagement subject which manufactures 'recycled nylon resin' and acquired ISO 14001 certification for whole management. Hyosung TNC implemented engagement activities with ECOTECH RM, a raw materials supplier. It leads suppliers to produce and supply more actively eco-friendly products. Since then, Hyosung TNC applies the same selection criteria to make more suppliers supply eco-friendly raw materials and introduce environment management system. It will also make suppliers' response activities (energy savings, enhancing capabilities, etcetera) to climate change vigorous through more active engagement activities.

Impact of engagement, including measures of success

Energy partnership is an engagement activity to deduce process improvements and reduction points, to quantify even reduction potential of real GHG emissions and to induce suppliers to reduce GHG emissions. Hyosung TNC implemented an engagement activity with 'ECOTECH RM' proper to the selection criteria among suppliers in the reporting year. (Details of engagement activities) 1. Investigation of the current status of energy management of companies (energy usage, current situation of process, etcetera) 2. Analysis of the current status of energy management (field measurement, analysis of measurement data by facility / process) 3. Implementation of technical training of energy management for companies two times (trainings for strengthening capabilities including energy management techniques) 4. Energy reduction technology and specification of expected effect, deduction of improvement points (Criteria for judging the success of engagement effects) Hyosung TNC judges whether the ongoing energy partnership is successful or not based on the criterion 'Did suppliers reduce GHG emissions through the relevant engagement activity?'. (Effects of engagement activities) Hyosung TNC drew improvements by understanding the current status (GHG emissions and electricity unit, consumption ratio by facility type, analysis of electricity consumption pattern, understanding the current status of plant operation) and examining improvement. It deducted 5 improvements in total (installation of insulation covers, change of heating system, replacement with premium grade motors, replacement with highly efficient lighting equipment, installation of solar power generation equipment) and also drew the following expected investment cost, reduction amount and reduction potential of energy and GHG After EMCOTHEC RM participated in engagement activities, it actually reflected the 5 improvements to reduce annual GHG emissions by 78.35tCO2 in total. GHG emissions was reduced by approximately 6 % more compared to 2020. This confirmed that Hyosung TNC's engagement activities in supply chain was successful.

Comment

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)
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% of customers by number

70

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

42.5

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

1) Client company group for engagement Hyosung TNC annually runs participative booths in various exhibitions at home and abroad so that it apprehends the trends in markets and consumers and shares various information on its technology and production products, particularly eco-friendly products. Hyosung TNC has annually participated in ISPO exhibition, the largest exhibition for outdoor sport goods in the world, since 2018 and participated in ISPO Munich in 2021. The relevant exhibition is one of engagement activities. The main client companies of Hyosung TNC, 'global fashion companies,' have participated in the exhibition every year so that it functions as a direct customer contact point. Hyosung TNC secures a contact point to hear customer voice through participation in the relevant exhibition so that it produces and supplies customized products through development of differentiated products reflecting customer needs. So, participation in exhibition is one of engagement activities. 2) Reasons for selecting engagement types Hyosung TNC provides the main clients with information on climate change. Hyosung TNC notices that this information sharing activity directly affects its sales and trading with customers. So, it considers a face-to-face engagement as the most direct and the most effective communication activity to specify customer needs among engagements with customers. One of them is a participation in the related exhibition. In particular, the ISPO exhibition is the largest in the world. The main client companies all participate in it so that Hyosung TNC actively promotes eco-friendliness of products. It participated in ISPO Munich in 2021 where introduced representative eco-friendly fibers, 'Creora Regen (spandex),' 'Mipan Regen (nylon)' and 'Regen (polyester),' promoted the acquisition status of GRS, an eco-friendly certification and the results of LCA calculation and shared information on recycled materials. Particularly, Hyosung TNC proposed the new sustainability expansion of Regen with multifunctional characteristics of regenerated fibers. Fashion brands such as Burberry, Coach and Osprey who participated in the exhibition suggested Hyosung TNC a strategic alliance to develop eco-friendly products.

Impact of engagement, including measures of success

(Criteria for judging the success of engagement effects) Hyosung TNS provides information on its eco-friendly products and technology through participation in exhibitions among engagement activities with customers. It tasks the question as the criterion for 'Did you make new contracts and transactions related to eco-friendly products and technology after the relevant engagement activity?'. (Effects of engagement activities) Hyosung TNC participated in ISPO Munich 2021 and provided information on LCA calculation and contents about acquisition of GRS certification to deliver information on eco-friendliness of its manufacturing yarn. Many brands who became to know the information recognized Hyosung TNC as a manufacturer of sustainable yarns. As a result, many global brands such as Burberry, Coach and Osprey (Hyosung TNC's main clients then) recommended Hyosung TNC strategic alliance for development of eco-friendly products so that it is establishing plans of production and supply. Osprey collected information in the 2019 ISPO exhibition and demanded Hyosung TNC development of eco-friendly products. Hyosung TNC completely developed and began to supply eco-friendly products to answer to the demand in 2020. It suggested newly strategic After then, Hyosung TNC has more than doubled the supply of eco-friendly yarn to Osprey every year. Hyosung TNC was suggested newly strategic alliance in the relevant exhibition and implements it. So, it judged that the engagement with customers achieved the successful effect in the reporting year. In the future, through active participation in the various related exhibition, Hyosung TNC shares information on its eco-friendly products and consistently expands the development and supply of customized eco-friendly products as well.

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 TNC knows the need to manage GHG emissions and Scope 3 emissions. Accordingly, when assessing suppliers, Hyosung TNC takes the followings as criteria for supplier assessment by considering whether they implement environmental management activities and whether their products reflect environmental factors. For supplier registration, Hyosung TNC made assessment criteria such as quality, deadline, price and management performance and environment, safety, ethic management level. Based on the same criteria, it conducts the regular assessment of suppliers. Hyosung TNC revised the behavior rules that include environments areas in the reporting year and suggests the behavior rules in the six items in total like the following: construction of environment management system, management of energy usage and GHG emissions, water resource management. Hyosung TNC demands the suppliers to respond actively to the related policy or system considering primarily the environmental aspect like climate change through management of environment management system when suppliers implement activities. It includes construction of data management system to monitor regularly energy usage and GHG emissions when they have manufacturing facilities. Also, Hyosung TNC suggests the behavior rules of improvement activities (energy usage and GHG emissions) like sustainable environmental impacts and urges suppliers to implement eco-friendly management.

% 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

100

Mechanisms for monitoring compliance with this climate-related requirement

Supplier self-assessment

First-party verification

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

Suspend 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

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

No, but we plan to have one in the next two years

Attach commitment or position statement(s)

<Not Applicable>

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

Hyosung TNC implements ESG management to achieve Group's 'Green Management 2030 Vision' and Hyosung TNC's 'ESG Management Vision.' It determines the directions of its climate change activities and policy participation base on ESG strategy and core value. The ESG Management Team collects information on climate change. Considering relation of various engagement activities with stakeholders and the future direction of ESG management, the ESG Management Committee deals the related issues and made decisions about whether activities proceed or not (Core values and main subjects of ESG management) 1. Development and sale of eco-friendly products, water management for promotion of 'circular economy' 2. Direct and indirect carbon reduction for 'carbon reduction' 3. Zero hazard rate for 'Safety and Health,' 4. Human rights management, improvements of environment surrounding plants and ecosystem, management of supply chain for 'Win-Win Growth' Hyosung TNC suggests various detailed promotional directions (tasks) of the ESG core value. For the achievement, it recognized engagement activities with stakeholders, 'supply chain, customers, government and industrial association,' in the whole value chain as crucial factors and continuously promote them. And Hyosung TNC pushes ESG management by reflecting situations such as policy and market change in ESG management.

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 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, assess actual GHG emissions of allotted workplaces and permit 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 TNC has been a subject of GHG emission scheme since 2018. It actively supports introduction and operation of the relevant system and participates in it. Also, for system improvement and efficient operation, the government has annually held presentations and hearings about system management. Hyosung TNC 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 TNC is a subject of emissions trading scheme and participates in diverse engagement activities for the involved system management. In 2020, particularly, Hyosung TNC recommended changing industrial criteria for free allocation of the fiber industry and collaborates with diverse industrial associations and industrial groups to suggest opinions by hearing opinions from the fiber industry continuously. And Hyosung TNC annually provides necessary data when the government demands for data for system management. In the reporting year, ban on gathering became effective due to covid-19 issues. Hearing and presentations were not held so that Hyosung TNC did not participate in them. Instead, Hyosung TNC presented its opinion on GHG policy through Korea Chemical Fibers Association which functions as a channel to government. When the Carbon Neutrality and Green Growth Commission was launched as a presidential commission, Korea Chemical Fibers Association indirectly stated opinions from companies.

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

In the reporting year, hearing and presentations were not held inevitably due to Covid-19. Hyosung TNC presented its opinion on policies related to climate change through the industrial association which it belongs to. 1. Difficulties in GHG reduction Hyosung TNC already introduced most reductions (recycling waste heating, fuel conversion, 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 TNC 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 (use period of allowances, decline in using ratio (%), etcetera). These matters cause difficulties. 2. Opinion on consulting programs for supporting tasks related to climate change in workplaces - In the case of energy reduction business investment, government support or training often is 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 reduction business corresponding to external business (Advance preparation to correspond to the requirements: installation measurement equipment for monitoring emissions before and after business, training of endurance period for economic addition, etcetera) - Know-how consulting of energy reduction plan by changing operational system without facility replacement 3. Comments on 2030 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 TNC 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

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)

Korea Chemical Fibers Association intends to contribute to promotion of the industry and desirable development of the related industry. It makes efforts to rationalize business for the Korean fiber industry' technical development, quality improvement, productivity improvement and better international competitiveness. It also tries to improve mutual interests among member companies. The members of Korea Chemical Fibers Association are the major domestic chemical fiber manufacturers. Based on polyester long fibers which account for the most output in Korea, the existing members' share exceeds 90 % in the domestic market. The sustainable activities of Korea Chemical Fibers Association are as follows. 1. It delivers contents of regulations related climate change and environment at home and abroad and 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 Economy 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 and conducted sustainability management trainings, two companies participated the sustainability management training in 2021. 3. it shares technology trends by sharing technologies for sustainable eco-friendly products / energy reduction and market trends at home and abroad. Companies regularly gathered to present each energy reduction activities and Hyosung TNC also announced its steam reduction technology.

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

125051000

Describe the aim of your organization's funding

Hyosung TNC 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 TNC's needs. At first, Korea Chemical Fibers Association provides a forum for sharing information on responses to climate change with domestic chemical fiber companies. Designating 'carbon reduction' as one of the Hyosung TNC's four values for sustainability management, Hyosung TNC actively participates in energy reduction activities. It participates in the meeting which Korea Chemical Fibers Association arranged and is monthly held in Gumi. Domestic chemical fiber companies share energy reduction activity there. Hyosung TNC shares the contents with other companies. Hyosung TNC announced steam reduction plan through adjustment of concentration of concentrators and GHG reduction effect through replacement with higher efficient refrigerators last year. In addition, the industry presents opinions about domestic GHG policy or reduction support programs to Korea Chemical Fibers Association. The presented unity opinions inside the industry are suggested to the government. When the Carbon Neutrality and Green Growth Commission was launched as a presidential commission in 2021, Korea Chemical Fibers Association as the representative initiatively indirectly stated opinions from the industry.

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

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

[REDACTED](2022.03.08).pdf

Page/Section reference

275~276pg

Content elements

Strategy

Emissions figures

Comment

Hyosung TNC's disclose management strategy and emission data through the business report. Since the published data of the business report (March of every year) is before the final conformity assessment is completed (June of every year), the data of the GHG emission verification report and the data of the business report may be different.

Publication

In voluntary sustainability report

Status

Underway – previous year attached

Attach the document

HyosungTNC2020Sustainabilityreport_En.pdf

Page/Section reference

pp.7~8, p.16, p.19, p.25, p.30, p.35, p p.69~74

Content elements

Governance

Strategy

Risks & opportunities

Emissions figures

Comment

Hyosung TNC publishes and discloses a sustainability report every year. It publishes a sustainability report in Korean and English between August and September every year, and the report includes data on chemical governance, strategies, risks and opportunities, and emissions.

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 Response 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	Hyosung TNC is submitting a report that is finally approved through the CEO report after compiling CDP data.	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
-----------------------	--

SC1.4

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

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