# MAKING A BETTER TOMORROW

2024 Moorim Climate Action Report



# About This Report

## Report Overview

Moorim Paper, Moorim SP, and Moorim P&P (hereinafter referred to as "Moorim") recognize the corporate role and responsibility in responding to global climate change and are committed to systematically advancing climate change response activities throughout our business operations. This report aims to proactively share climate-related status and achievements in line with the IFRS S2 "Climate-related Disclosures" and TCFD requirements, which were established and published by the ISSB (International Sustainability Standards Board) under the IFRS (International Financial Reporting Standards) Foundation in June 2023, and to enhance communication with stakeholders.

## Reporting Entities and Scope

This report provides sustainability-related financial information of Moorim. The scope of the information within this report is based on the separate financial statements of Moorim Paper, Moorim SP, and Moorim P&P with data presented separately for each company.

## Reporting Standards

This report has been prepared with reference to the requirements of the IFRS S2 "Climate-related Disclosures," a standard established and published by the ISSB (International Sustainability Standards Board) under the IFRS (International Financial Reporting Standards) Foundation. The financial information in this report is based on annual reports prepared according to the K-IFRS (Korean International Financial Reporting Standards).

## Reporting Currency

The reporting currency of this report is the South Korean Won (KRW).

## Limitations

The sustainability-related financial information in this report includes numerous forward-looking statements based on assumptions made by the consolidated entities. These forward-looking statements are based on various assumptions, which are qualitatively disclosed within this report. Since this report is based solely on current facts, circumstances, and assumptions, the information may change if additional or revised matters arise. Furthermore, there is no obligation to disclose any modifications to forward-looking statements or to reflect events or circumstances occurring after the report's publication date. The consolidated entities bear no responsibility for any costs, losses, or damages resulting from changes to the information provided in this report due to unforeseen events.

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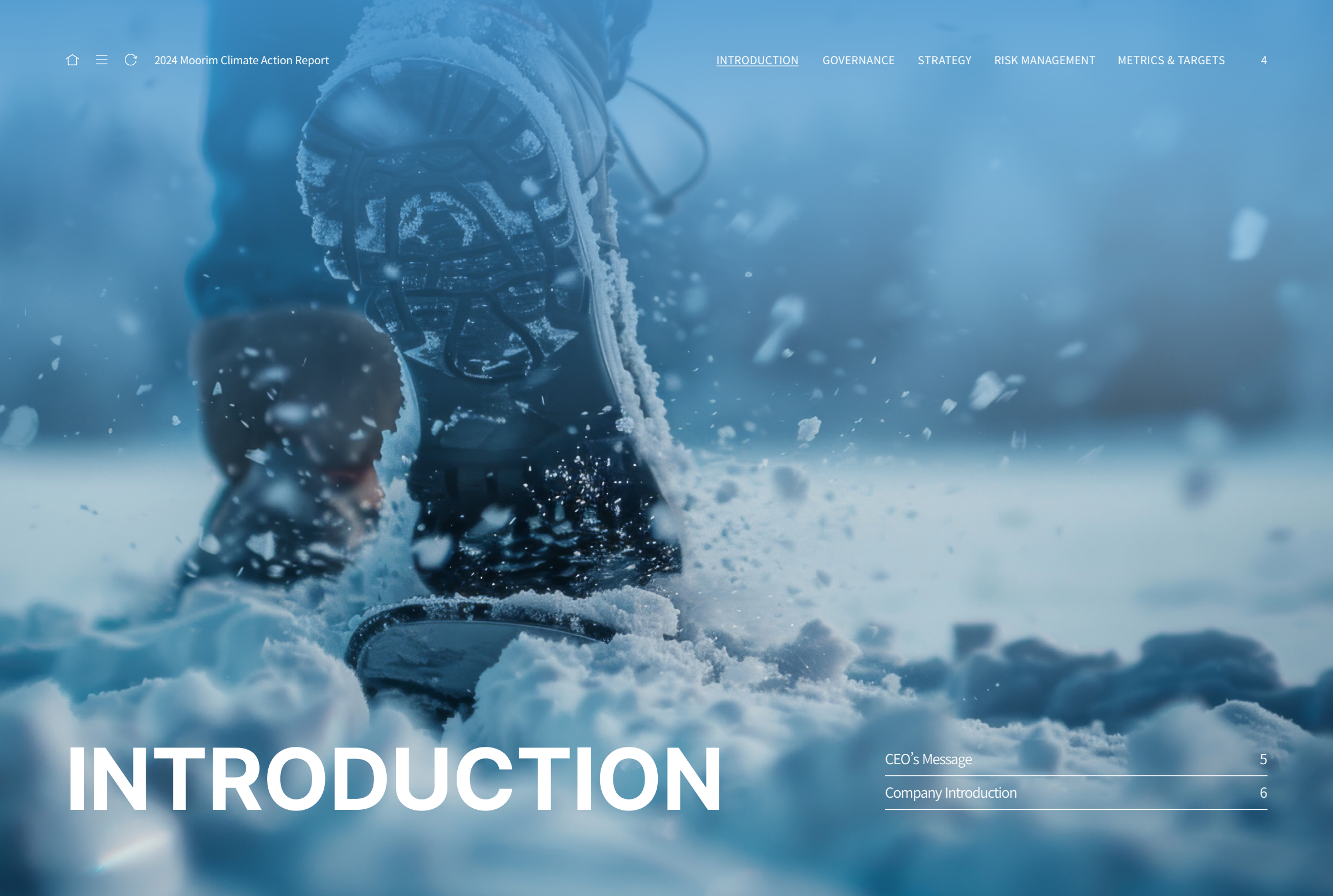
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# CEO's Message

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## MAKING A BETTER TOMORROW



Dear Respected Stakeholders,

The year 2023 was pivotal, marked by global climate agreements and technological innovations driving the shift to a low-carbon economy. Particularly in advanced economies, the transition to a low-carbon economy has gained momentum, making environmental regulations in major export countries a crucial factor for sustainable corporate growth. In response to these changes, Moorim prioritizes environmental responsibility, identifying the risks and opportunities brought about by climate change to create new value. Our goal is to promote sustainable growth and establish ourselves as a leading company in pulp, paper, and advanced materials, driving this transition.

### Designing Climate Resilience Strategy

Under the environmental management vision of becoming an "Eco-friendly Global Pulp & Paper Company," Moorim recognizes climate change as a central challenge to corporate management and has developed a "2050 Carbon Neutrality Roadmap." We aim to strengthen systems that manage greenhouse gas emissions across the entire corporate value chain. Furthermore, we disclose TCFD report and transparently share our carbon neutrality goals to successfully implement our medium- to long-term climate change strategy. Through these efforts, Moorim will fulfill its responsibility in addressing climate change and play a leading role in shaping a sustainable future.

### Driving Sustainable Innovation

In alignment with the growing global demand for eco-friendly products and the diversification of the market, Moorim advances our transition towards an eco-friendly business portfolio. Leveraging Moorim's pulp and paper philosophy, we are designing innovative eco-friendly products that consider the entire product life cycle, including post-consumer responsibility, using our unique circular economy model that utilizes natural resources. Our recently launched eco-friendly brand "moohae" contributes to realizing ESG values in daily life. We plan to expand our molded pulp and eco-friendly advanced material businesses continuously, preparing for the free plastic era. In export markets, we will proactively meet the stringent certification requirements and secure our product's competitiveness, ensuring that we meet the expectations and trust of our domestic and international customers through a sustainable business model that allows us to maintain market leadership.

### Developing Eco-Efficient Operations

Moorim is steadily progressing towards our 2050 carbon neutrality goal. In the short term, we will operate eco-friendly business sites, such as using black liquor—a byproduct of the pulp production process—as biomass fuel to generate electricity and steam. In the long term, we plan to develop various strategies including the procurement of renewable energy (direct PPA), transitioning to low-carbon fuels, and implementing carbon offset programs. We aim to build sustainable operations that responsibly address climate change. Additionally, Moorim will encourage stakeholder participation in ESG practices throughout the supply chain, particularly within our core business areas, to establish a sustainable value chain that grows together with all stakeholders.

Our goal is not just carbon neutrality but leading the changes necessary for a sustainable future. We ask for your continued interest and support.

Thank you.

Moorim Paper • Moorim SP • Moorim P&P
**President & CEO** Lee. Dokyun

# Company Introduction

## Introduction of Moorim

## Moorim Paper

### High Value-Added Paper Specialist Company

Moorim Paper produces high-quality coated paper, premium digital paper, high value-added printing & writing paper, and industrial paper based on excellent facilities and quality competitiveness. It is recognized globally for its high productivity through the best facilities, such as hybrid former paper machines and coaters with high production speeds, and is leading the way in producing environmentally friendly products by becoming the first in the paper industry to obtain FSC® certification and the Environmental Product Declaration certification. In addition, as a leading local company in Jinju, the company is strongly dedicated to the development of local culture through various cultural and arts support projects such as Moorim Mecenat and Paper Airplane Competition.

| Category | Description |
|---|---|
| Company Name | Moorim paper |
| Establishment Date | December 1975 |
| Capital | KRW 104 bilion |
| Location | 1003 Namgang-ro, Jinju-si, Gyeongsangnam-do, 52809, Republic of Korea |
| Production Volume | 319,609 tons |
| Sales Volume | 324,605 tons |
| Revenue | KRW 514.3 bilion (separate disclosure criteria) |




### Moorim Paper's Business Area

| Printing & Writing Paper | Industrial Paper | Specialty Paper | Specialty Paper |
|---|---|---|---|
| Coated Paper | Digital Paper | Board Paper | Shopping Paper |
| Uncoated Paper | Label Paper | | Rough gloss Paper |
| | Release Paper | | |
| | Transfer Paper | | |

# Company Introduction

## Introduction of Moorim

# Moorim SP

### Eco-friendly Specialty Paper Specialist Company

Moorim SP, the first company in Korea to usher in the era of mass production of uncoated paper, is renowned as a leading eco-friendly specialty paper company. Leveraging its advanced and differentiated specialty paper technology, it produces Neo CCP, which holds the largest market share, as well as security paper, ballot paper, and more. The company holds patents for a variety of high-quality specialty papers. Additionally, through its eco-friendly paper products (Neoforêt), which are biodegradable, recyclable, and have passed the tests of the US Food and Drug Administration (FDA) and the German Federal Institute for Risk Assessment (BfR), Moorim SP collaborates with companies seeking alternatives to plastic and leads the development of related technologies.

| Category | Description |
|---|---|
| Company Name | Moorim SP |
| Establishment Date | July 1956 |
| Capital | KRW 11 billion |
| Location | 205 Chimsan-ro, Buk-gu, Daegu, 41550, Republic of Korea |
| Production Volume | 72,378 tons |
| Sales Volume | 72,844 tons |
| Revenue | KRW 161.1 bilion (separate disclosure criteria) |



### Moorim SP's Business Area

| Neoforêt | Neoforêt | Industrial Paper | Specialty Paper | Specialty Paper |
|---|---|---|---|---|
| Neoforêt PACK | Neoforêt FLEX | Release Paper | Board Paper | Food packaging Paper |
| Neoforêt STRAW | Neoforêt Aircushion | | Information Paper | Fancy Paper |

# Company Introduction

## Introduction of Moorim

# Moorim P&P

### Korea's Only Comprehensive Pulp Materials Company

Moorim P&P, through the country's only natural pulp production facility, produces bleached kraft pulp with excellent formation, smoothness, and bulk. An integrated system from pulp to paper ensures the highest quality paper with intact fibers. Additionally, using natural pulp, the company has developed eco-friendly molded pulp, paper wet tissues, and other products, demonstrating the diverse applicability of pulp. Furthermore, based on unique domestic pulp technology, Moorim P&P is creating new value through research and development of pulp and advanced materials such as nanocellulose, bioplastics, and lignin.

| Category | Description |
|---|---|
| Company Name | Moorim P&P |
| Establishment Date | January 1974 |
| Capital | KRW 155.9 billion |
| Location | 3-36 Ubonggangyang-ro, Onsan-eup, Ulju-gun, Ulsan, 45011, Republic of Korea |
| Production Volume | Pulp 424,261 tons<br>Paper 458,717 tons |
| Sales Volume | Pulp 198,351 tons<br>Paper 458,757 tons |
| Revenue | KRW 719.2 bilion (separate disclosure criteria) |



### Moorim P&P's Business Area

| Pulp | Molded Pulp | Molded Pulp | Printing & Writing Paper | Industrial Paper |
|---|---|---|---|---|
| Bleached Kraft Pulp | Product Aircushion-ing/Packaging | Takeout Container | Coated Paper | Label |
| | Other Household Items | Coffee Shop/Bakery | Uncoated Paper | |
| | | | MFC | Specialty Paper |
| | | | | Fancy Paper |

# Company Introduction

## Introduction of Moorim

### Global Network




### Moorim's Affiliated Companies

#### Moorim Powertech

**Leader in the Future Energy Business**

Moorim Powertech is leaping forward as an eco-friendly energy company by mainly engaging in businesses that contribute to the decarbonization of the existing energy industry through combined heat and power generation, district heating and cooling, and new and renewable energy power generation businesses.

| | | | |
|---|---|---|---|
| **Establishment Date** | March 1995 | **Revenue** | KRW 64.8 billion |
| **Capital** | KRW 16 billion | **Location** | 24 Namgang-ro 1317beon-gil, Jinju-si, Gyeongsangnam-do |

#### Moorim Capital

**Financial Institution Specializing in Credit**

Moorim Capital is focusing its operational efforts on core financial sectors such as leasing, installment sales, and project financing (PF), providing financial services by creating stable cash flows through investments.

| | | | |
|---|---|---|---|
| **Establishment Date** | May 2009 | **Revenue** | KRW 53.7 billion |
| **Capital** | KRW 65 billion | **Location** | 17th floor, Building D-1, D Tower, 17 Jongno 3-gil, Jongno-gu, Seoul |

#### Mirae Development

**Comprehensive Resort with Great Accessibility**

Mirae Development operates a comprehensive resort, including a golf course and lodging business near the city center, providing leisure services and recreational culture that take into account the daily lives of customers.

| | | | |
|---|---|---|---|
| **Establishment Date** | March 1971 | **Revenue** | KRW 30.4 billion |
| **Capital** | KRW 133 billion | **Location** | 112 Nampyeong-ro, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do (Namgok-ri, Yangji Pine Resort) |

# Company Introduction

## Introduction of Main Products

### Pulp

Moorim produces and sells natural pulp with fresh wood fibers from the only pulp and paper integrated mill in Korea. In addition, based on this unique pulp production technology, we launched the eco-friendly molded pulp 'moohae'. Recently, we developed 'real' paper wet wipes made from 100% natural pulp, and were recognized for our eco-friendliness by being selected as 'Superior Sustainability' at the '2023 Seoul Cafe Show'. Moorim plans to continue promoting the sustainable value of pulp by developing various eco-friendly products using pulp.

**Pulp**

Moorim P&P produces top-quality bleached hardwood kraft pulp with intact fibers. Moorim P&P's pulp is a broad-leaved tree pulp where acacia is blended to oaks and is characterized by excellent formation, smoothness, and high bulk.




**Wet Tissue**

'moohae Wet Tissue' is made of 'paper fabric', a natural biodegradable material that replaces synthetic fibers such as existing non-woven fabrics and polyester, allowing it to be used without concerns about microplastics. It is an eco-friendly product that can be separated and disposed of as paper after use.

**Molded Pulp**

'moohae molded pulp' is manufactured in state-of-the-art facilities by sending slurry-form raw pulp through a sealed transfer pipe, ensuring hygienic production free from contamination by foreign substances. In addition to being certified as biodegradable, it is also the only product in the domestic molded pulp industry to obtain Food Safety System Certification (FSSC 22000), proving its world-class food safety standards.

# Company Introduction

## Introduction of Main Products

### Paper

Moorim, the top company in the domestic printing & writing paper market, is leading the domestic paper market by utilizing its unrivaled technology and expertise to produce a wide range of papers, including printing & writing paper, industrial paper, information paper, and specialty paper. In addition, Moorim is presenting the eco-friendly value and potential of paper through the development of eco-friendly papers that can be used in various fields such as food and beverage, parcel delivery, and cosmetics.

### Printing & Writing Paper

Moorim produces a variety of papers to meet customer needs, ranging from high-quality printing & writing paper such as Uncoated paper, Coated Paper, and rough gloss paper used in publications such as books, magazines, and brochures to industrial printing & writing paper such as digital paper and labels.




### Eco-friendly Paper (Neoforêt)

Moorim is leading the domestic eco-friendly market by developing a variety of eco-friendly paper products, including biodegradable paper cups, recyclable paper straws, paper inner frames and paper tubes used in cosmetic packaging, and paper packaging for frozen foods.

### Specialty Paper

Moorim adds various values to life with high-quality, high-value specialty papers incorporating advanced technologies such as Neo CCP for premium cosmetic packaging, giro paper, ballot paper, lottery paper, etc.

# Company Introduction

## Introduction of Main Products

**Advanced Materials**

Moorim practices ESG management through research and development of next-generation eco-friendly advanced materials such as nanocellulose and bioplastics using natural pulp. Furthermore, Moorim utilizes the biomass generated during the pulp production process, known as 'black liquor', as a source of energy for factory operations, producing products in an eco-friendly manner.

### Nanocellulose (CNF)

Nanocellulose is an eco-friendly advanced material made by dividing cellulose fibers extracted from pulp into nanometer sizes (about one billionth of a meter). Although it has a low density, it has excellent strength, thermal stability, hydrophilicity, and water retention properties. Nanocellulose has many useful properties, making it suitable for applications such as composite materials, gas barrier films, paints, paper additives.

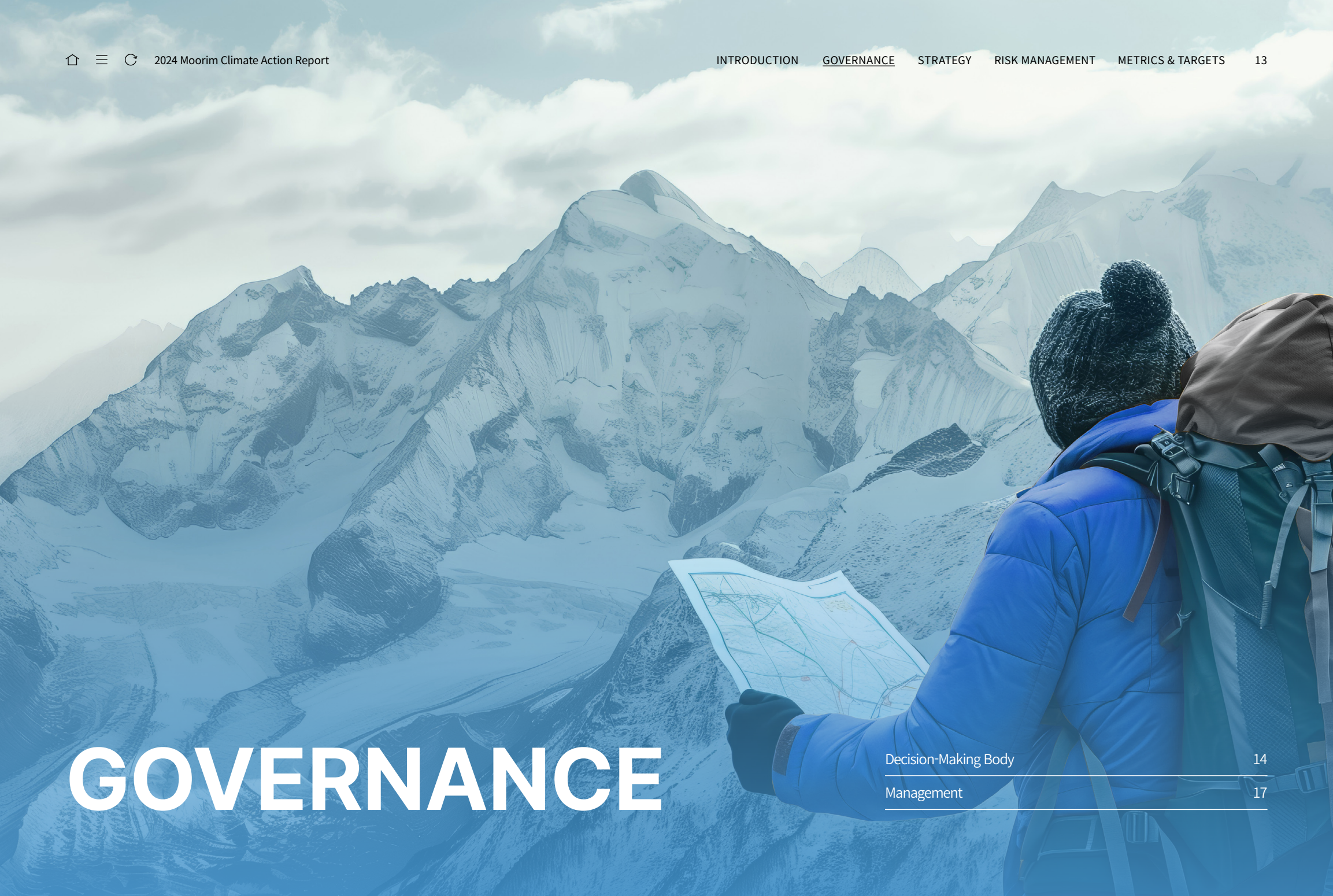



### Lignin (Black Liquor)

We are establishing an eco-friendly energy circulation system utilizing the pulp production process. During the pulp production process, fibers (pulp) are separated through the digestion process, and the remaining lignin and other extracts and digesting chemicals create black liquor, a form of renewable energy source. The black liquor is converted into steam and electricity required for the process through combustion.

### Bio Plastic (CellRim®)

Biodegradable and eco-friendly bioplastic products are produced through the addition and extrusion of plastic resin to Wood Particles (WP) and Pulp Flakes (cellulose) generated during the pulp production process. These materials are used as substitutes for petroleum-based resins and glass reinforcements in products such as hangers, toothbrushes, and tableware.



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# Decision-Making Body

## (1) Policies on Decision-Making Bodies and Responsibilities

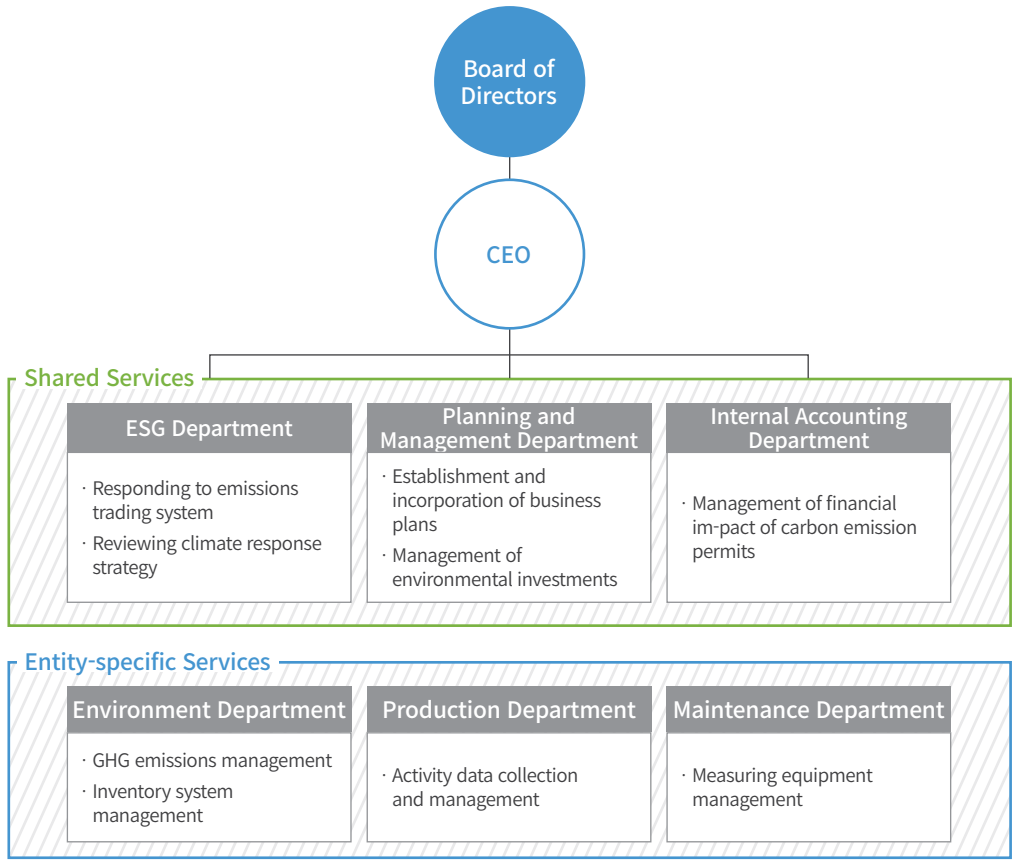
Each Board of Directors (BOD) of Moorim is the highest decision-making body related to sustainability, including climate change, and has the authority to establish strategies for promoting sustainable management and to manage and supervise the approval and implementation of policies. Moorim stipulates significant sustainability-related matters as agenda submitted for the BOD and regularly monitors related risks and opportunities at the board level. If actual or potential risks and opportunities identified based on the ESG risk management regulations enacted in August 2022 are discovered, they are immediately reported to the CEO, and if they are major issues, they are submitted to the BOD based on the Board regulations. In addition, Moorim reviews the company-wide overall risk management status, including climate-related risks, on a quarterly basis through the regular Board of Directors meetings. Through this, Moorim strives to ensure that ESG issues, including climate-related issues, are essentially incorporated in its overall strategy establishment, governance, and corporate responsibility.

### (A) Roles and Authorities of Management and Supervision

In the BOD operating regulations, under the section 5. Other Matters > (d). significant issues related to non-financial risks (ESG) are included, and these major matters are resolved by the board of directors.

### (B) BOD's Management and Supervision System

Moorim has established the BOD and the governance system at a company-wide level to responsibly respond to climate change. While supervising issues and risks related to ESG and climate change, the BOD reviews the Company's response strategies and policies, and monitors management performance and progress. The ESG Department practically implements the climate change response strategy. Additionally, each dedicated organization makes various efforts such as proactive legal compliance, climate factor reviews in cases of establishing business direction and investing in large-scale facilities, management of financial impacts of carbon credit, and systematic management of emissions through an inventory system.



# Decision-Making Body

## (2) Competency Assessment and Development for Management and Supervision

### (A) BOD's Composition

Moorim's BOD, as the highest decision-making body, is composed with consideration for diversity and expertise, including members' ESG-related backgrounds, to strategically respond to climate-related risks and opportunities across all areas of management.

### (B) Competency Enhancement Plan

Moorim has established relevant regulations to allow external trainings for external directors to enhance their expertise. In 2023, internal training was conducted for external directors. This training was held twice to ensure that the BOD can make appropriate and rational decisions and execute tasks smoothly, covering the corporate's structure, industry trends, and long-term vision for future management initiatives. The training conducted on August 3, 2023, included an explanation of eco-friendly products.



Internal Director

| Competence | Name | Position | Career Highlights | Competence |
|---|---|---|---|---|
| Moorim Paper, Moorim SP, Moorim P&P | Do-kyun Lee | CEO/BOD Chairman | Head of Strategy, Head of the Management Division, Head of the Paper Business Division | Leadership, Pulp & Paper Industry, Management & Accounting |
| | Jong-chul Rhee | Planning/ Strategy | Strategic Planning Department Head, Planning Management Department Leader, Public Relations Department Leader, ESG Department Leader, Current Management Planning Director | Leadership, Pulp & Paper Industry, Management & Accounting, ESG |

External Director

| Competence | Name | Position | Career Highlights | Competence |
|---|---|---|---|---|
| Moorim Paper | Seung-tae Sohn | Audit Committee | Senior Deputy Secretary General of the Board of Audit and Inspection, Auditor of Small and Medium Business Bank, Adviser to Yulchon LLC,currently an internal director of Daeil Industrial Co., Ltd. | Risk Management, Legal |
| | Si-jong Park | Audit Committee | Auditor of the Board of Audit and Inspection, Auditor of Hana USB Asset Management, Adviser of Yulchon LLC, Auditor of Daesang, Inc | Risk Management, Legal |
| | Cheol-in Mo | Audit Committee | CEO of KEMPOL CORP. | Leadership |
| Moorim SP | Se-do Lee | Audit Committee | Auditor General of the Board of Audit and Inspection, Standing Auditor of Korea Rural Community Corporation, Vice President of Korea Audit Association | Risk Management |
| | Chul-hwan Kim | Audit Committee | Currently a Professor of the Department of Environmental Forestry at Gyeongsang National University, President of the Korea Pulp Paper Engineering Society | Pulp and Paper Industry, ESG |
| | Man-sik Seo | Audit Committee | Busan Regional Labor Office Commissioner, Welfare Director of Korea Workers' Compensation and Welfare Service, Technical Director of Korea Industrial Safety Association (Industrial Accident Prevention Work), Operating industrial accident prevention work consulting service | Risk Management, ESG |
| Moorim P&P | Jae-duk Lee | Audit Committee | Director of the Board of Audit and Inspection, Full-time Audit Committee member of KDB Life, Currently, Part-time Auditor of Hyundai Asset Management, Inc. | Risk Management, Business and Accounting |
| | Dong-hyun Lee | Audit Committee | An accountant at Samjeong Accounting Firm, an accountant at Daesung and Hankyung Accounting Firm, currently an accountant at Shinhan Accounting Firm, a Tax Accountant | Risk Management, Business and Accounting |
| | Il-tae Kim | Audit Committee | Auditor General of the Board of Audit and Inspection, Financial Supervisory Service Auditor, Currently, full-time auditor of Nuriplan | Risk Management, Management and Accounting |

# Decision-Making Body

## (3) Methods and Frequency of Obtaining Information Related to Risks and Opportunities

The BOD primarily obtains the necessary information from the ESG Department to manage and supervise climate-related risks and opportunities. The ESG Department supports the BOD sufficient understanding and judgment by providing preliminary reports and various materials. Specifically, the ESG Department analyzes the environmental performance of each business site and reports related environmental performance, including climate, water quality, air, water consumption, wastewater, waste, and sales of environmentally certified products, to the BOD four times a year (quarterly). Consequently, the BOD is well-informed about climate-related risks and opportunities and can make key decisions efficiently.

### (A) Key Status of Obtaining Related Information within the Reporting Period

*Same for Moorim Paper, Moorim SP, and Moorim P&P

| Meeting Date | Agenda | Approval/ Report | Related Information |
|---|---|---|---|
| 2023.02.08 | Establishment of 'Greenwashing Prevention Guidelines' | Report | Review risk management criteria in response to increased legislation to sanction greenwashing (reckless green marketing and promotion) |
| 2023.11.02 | 2023 Q3 ESG Environmental Indicator Performance Report | Report | Performance report on quantitative evaluation factors in environmental fields such as greenhouse gases/energy, air/water quality, waste, etc. |
| 2023.11.30 | 2024 Sustainability Report Publication Plan Report[1] | Approval | Approval of the performance scope of issuing a Sustainability Report containing the corporate's ESG management activities, including climate-related issues |
| 2024.02.15 | Report on the Establishment and Promotion of Climate Change Response Strategies[2] | Approval | Approval of the performance scope of issuing a TCFD report based on the carbon neutrality strategy/goal establishment and climate disclosure framework |
| | 2023 Q4 ESG Environmental Indicator Performance Report | Report | Performance report on quantitative evaluation factors in environmental fields such as greenhouse gases/energy, air/water quality, waste, etc. |
| 2024.05.02 | Report on the Results of Double Materiality Assessment | Report | Derivation of mid-to-long-term ESG issues and ESG areas requiring proactive response in the future |

1) Moorim SP
2) Moorim Paper, Moorim P&P

## (4) How to Consider Climate-Related Risks and Opportunities in Major Decision-Making Processes

Moorim deliberates and resolves material issues stipulated in the articles of incorporation and regulations of the BOD, such as business planning and operations, budget/settlements, and major new investment plans, through the BOD with the goal of continuous growth. During the process of deliberating on important management matters, climate-related risks and opportunities are considered.

## (5) Management and Supervision of Target Setting and Progress

Moorim manages and supervises the target setting and implementation status for responding to climate-related risks and opportunities through the BOD. In addition, based on the environment management policies, continuous improvement activities are carried out through monitoring and evaluating environmental management activities and performance, and a regular monitoring system has been established by reporting quarterly environmental performance against relevant indicators to the BOD. In the second half of 2024, Moorim plans to report its climate-related targets to the BOD, and related information can be referenced in the metrics and targets section for climate-related targets. Moorim links carbon emission-related activities to the remuneration of internal directors based on the remuneration regulations to clarify the responsibility of top management for responding to climate change.

### (A) Results of Management and Supervision for Target Setting and Progress

| Category | Date | Description |
|---|---|---|
| Progress Management and Supervision | 2023.11.02 | 2023 Q3 ESG Environmental Indicator Performance Report |
| Progress Management and Supervision | 2024.02.15 | 2023 Q4 ESG Environmental Indicator Performance Report |

# Management

## (1) Delegation of Climate-Related Management and Supervision Roles

The CEO oversees the establishment and execution of detailed plans, evaluation of environmental performance, and monitoring and decision-making on major climate change-related issues, in line with eco-friendly management strategies and policies, including climate risks.

### (A) ESG Department and Execution Organization

Moorim's management operates an ESG Department to support the supervision of climate-related risks and opportunities. The ESG Department aggregates and manages the company-wide environmental performance in line with mid- to long-term environmental management goals, such as response to climate change and establishment of strategies to respond to greenhouse gas emissions trading system. In addition, the environment, production, maintenance, and sales departments collaborate to efficiently execute the establishment and implementation of detailed strategies, such as improving energy efficiency, recycling wastewater, and expanding sales of environmentally certified products.

## (2) Management Control and Procedure

The management manages and oversees 1) compliance with laws and regulations, 2) declaration of environmental management policies, 3) establishment of environmental management system and adoption of management regulations, 4) environmental performance and data inspection, 5) identification of risks and promotion of improvement activities and 6) continuous improvement of environmental performance through the Environmental Management System (EMS) according to the internationally recognized standard ISO 14001. Moorim Paper and Moorim P&P obtained ISO 14001 in 2010 and 2011, respectively. The business site that has obtained ISO 14001 certification undergo annual post-certification reviews by a third-party external professional organization and renewal reviews every three years. Apart from certification acquisition, internal auditors independently check whether the environmental management system is functioning correctly and receive audits and assurance on the environmental management system.



# STRATEGY

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# Types of Climate-Related Risks and Opportunities

Moorim referred to the disclosure topics from the SASB Pulp & Paper Products industry during the stage of identifying climate-related risks and opportunities that could reasonably be expected to affect its outlook.

## (1) Expected Impact of Risks and Opportunities by Timeline

| Category | | | Risk and Opportunity | Description | Expected Impact |
|---|---|---|---|---|---|
| Transition | Risk | Strengthening Policies and Regulations for Climate Change Mitigation | Tightening Regulations on Greenhouse Gas Emissions Trading | The emissions trading system allocates an annual emission allowance to facilities emitting greenhouse gases, allowing them to sell surplus or purchase deficit based on their actual emissions. As the revision of the emission trading system is being considered to reduce the total emission allowance and expand contributions to achieving national reduction targets, the proportion of free allocations is expected to decrease after the third phase of the emission trading system. This may lead to a mid- to long-term burden of costs for purchasing emission permits or investment costs related to reduction activities. | Mid- and long-term |
| | | | Implementation of the U.S. Clean Competition Act (CCA) and EU Carbon Border Adjustment Mechanism (CBAM) | The U.S. Clean Competition Act (CCA) is a proposed bill aimed at encouraging 'climate crisis response' and 'fair competition' by imposing a carbon tax (USD 55 per ton) on developing countries with carbon intensity levels 3 to 4 times higher than the global average. The tax will apply to 12 items (based on the 6-digit HS Code), including the paper industry, and the applicability will be determined based on item code classification. The implementation date is scheduled for January 2025, which is earlier and broader in scope compared to the EU CBAM, potentially burdening the corporate's export activities. The Carbon Border Adjustment Mechanism (CBAM) is a system that imposes emission costs on imports to reduce the carbon emission cost gap between products produced in the EU and imported products. In case where products are imported from regions with lower emission costs than the EU, an importer shall purchase CBAM credits, which could impact the competitiveness of exporting companies in the EU market when it becomes mandatory. | Mid- and long-term |
| | | | Adoption of the European Union's Deforestation Regulation (EUDR) | The EUDR is a regulation designed to minimize deforestation during the product production process, ultimately contributing to biodiversity conservation and climate change mitigation. If a country exporting raw materials is classified as a high-risk country under the EUDR, it could face restrictions on exporting products to the EU, weakening its market competitiveness. | Short-, mid- and long-term |
| | Opportunity | Expansion of the Market with Ecofriendly Products | Expansion of the Market with Ecofriendly Products | With the global trend towards eco-friendly consumption expanding, the demand for eco-friendly products in the packaging market is also increasing, and it is predicted to grow by 7.7% annually until 2030. In particular, the non-eco-friendly plastic and paper market, which can be considered a potential market, is estimated to be worth about KRW 548 trillion, presenting an opportunity to enhance corporate profitability. Not only in the packaging market but also in various industries such as the cosmetics industry related to wood-derived materials, the demand for the development of eco-friendly products is increasing. This trend can provide corporations with opportunities to diversify their business portfolios from mid- and long-term perspectives. | Short-, mid- and long-term |
| Physical | Risk | Abnormal Weather | Average Temperature Rises Caused by Climate Change | Climate disasters such as strong winds, wildfires, floods, hailstorms, thunderstorms, and heavy rain can cause damage to corporate assets (buildings, facilities, inventory) and ultimately result in a decrease in sales due to increased restoration costs and production interruptions. | Short-, mid- and long-term |

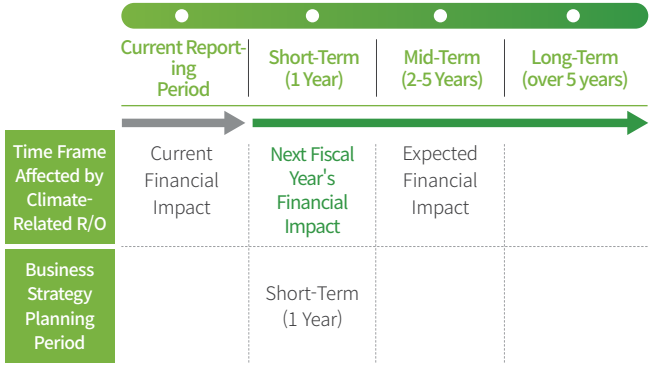
## (2) Timeline of Impact for Identified Risks and Opportunities

Moorim defines the time frame during which climate-related risks and opportunities are expected to arise as follows:

| Time Frame | Short-Term | Mid-Term | Long-Term |
|---|---|---|---|
| Target Period | 1 year | 2-5 years | Over 5 years |

## (3) Linkage among Strategic Decision-Making Planning Periods

Moorim's strategic decision-making is achieved through the establishment of annual business plans and the review of mid- to long-term prospects. This period takes into account the market change cycle of the business portfolio and the research and development period for new products. During the planning process, climate-related risks and opportunities are considered through the diagnosis of internal and external trends and current conditions.



# Business Model and Value Chain

## 1) Current and Expected Impacts on Business Model and Value Chain

Moorim categorizes its business model into paper, pulp, and finance based on the nature of its businesses. The value chain includes all activities and interactions that occur in the process of producing and supplying a product. The business model and value chain activities of paper and pulp categories defined by Moorim are 1) product and technology development, 2) raw material procurement, 3) production and manufacturing of products, 4) sales and marketing, 5) distribution and transport of raw materials and products, and 6) usage and disposal of sold products. Moorim has identified sustainability-related risks and opportunities, as detailed on the page 19, and the current and expected impacts of these risks and opportunities on the business model and value chain in the paper and pulp sector is as follows.




### (A) Transition risk: Strengthened Policies and Regulations to Respond to Climate Change

Globally, there is a trend of implementing national policies and strengthening carbon pricing-related regulations to transition to a low-carbon society. As a result, corporations may see an increase in operating costs across their business models and value chain activities depending on their greenhouse gas emissions. The risk of 'Strengthened Policies and Regulations to Respond to Climate Change' primarily impacts Moorim's business model and value chain activities, specifically in 2) raw material procurement, 3) production and manufacturing of products, and 4) sales and marketing.

| Activity | Risk and Opportunity | Current Impact | Expected Impact |
|---|---|---|---|
| Raw Material Procurement | Adoption of the European Union's Deforestation Regulation (EUDR) | There are no practical policy impacts at present since the implementation is scheduled for December 2024. | Due to the UK's withdrawal from the EU, Moorim, which has a sales subsidiary in the UK, is not subject to EUDR. However, we may be directly and indirectly affected by requests from customers who are subject to EUDR. Additionally, considering that the UK shares geographical, culture, and social commonalities with EU countries, carbon-related policies such as the implementation of CBAM are being established and implemented in line with the EU, taking into account the possibility from a mid- to long-term implementation. |
| Production and Manufacturing of Products | Strengthened Regulations on Greenhous Gas Emissions Trading System | There are no financial impacts such as incurring additional purchasing costs for emission permits during the third planning period for the emissions trading system. | Depending on future emission permit price forecasts and changes in the proportion of free allocations, liabilities may arise if existing emission levels are maintained. |
| Sales and Marketing | Implementation of the U.S. Clean Competition Act (CCA) and EU Carbon Border Adjustment Mechanism (CBAM) | (CCA) There are no practical policy impacts as the adoption timing has not been confirmed after its proposal.<br>(CBAM) There are no practical policy impacts since it is still in transition period. | (CCA) Given that the taxation method considers both the industry average emission intensity by country of origin and the carbon emissions per product, an additional tax of $55 per metric ton will be levied for each product, accounting for the difference between the industry average emissions intensity of the United States and that of the country of origin. Accordingly, additional carbon taxes may be imposed on products exported to the U.S.<br>(CBAM) Should the paper category becomes subject to the Carbon Border Adjustment Mechanism in the future, carbon border adjustment taxes may be levied on products exported to Europe. |

# Business Model and Value Chain

## 1) Current and Expected Impact on Business Model and Value Chain

### (B) Transition opportunity: Expanding the Market with Eco-friendly Products

With the growing consumer preference for eco-friendly products, the market for sustainable paper and packaging is poised for expansion. As the demand for pulp and wood-derived materials as alternatives to fossil fuel-based products accelerates across various industries such as cosmetics, automotive, electronics, paint, and textiles, new market creation opportunities are on the horizon. This transition opportunity, termed 'Expansion of the Market with Eco-friendly Products,' is set to significantly impact Moorim's business model and value chain activities, particularly in the areas of 1) product and technology development and 4) sales and marketing.

| Activity | Risk and Opportunity | Current Impact | Expected Impact |
|---|---|---|---|
| **Product and Technology Development** | Growing Demand for Eco-friendly Products in the Market | (Paper and Packaging Sector) The demand for biodegradable and recyclable products from stakeholders including customers, is diversifying and becoming more sophisticated. This necessitates the development of technologies and the acquisition of certifications to secure market leadership. The shift in consumer preference towards eco-friendly products in the cosmetics industry has led to increased demand for alternatives to animal-derived materials. | (Paper and Packaging Sector) As the demand for eco-friendly products continues to expand, especially in global markets, opportunities in the export market are expected to grow.<br>(Materials Sector) The demand for eco-friendly materials that replace fossil fuel-derived plastics in various industries such as automotive interiors, electronic product exteriors, paint, and textiles is rapidly increasing. This contributes to secure stable new revenue sources upon commercialization and market preemption. |
| **Sales and Marketing** | Growing Demand for Eco-friendly Products in the Market | In the paper sector, the increasing demand for customized product to meet the requirements of major export countries presents opportunities for export diversification and revenue growth. | With the continuous growth of the eco-friendly paper and packaging market, the demand for product customization by country is expected to diversify and increase.<br>In addition, due to the global trend of reducing plastic use, such as the adoption of the plastic tax by the EU, the demand for the eco-friendly paper and packaging is expected to accelerate. |

### (C) Physical risk

Some of Moorim's production facilities are located on the coast, exposing them to natural disasters such as typhoons and heavy rains. These natural disasters pose risk factors, including restoration costs (direct facility investment and insurance rate increases) and asset damage (damage to inventories of finished products and merchandise) due to facility damage and waterlogged products.

Accordingly, physical impacts have been analyzed based on the low-carbon scenario (SSP1-2.6) and high-carbon scenario (SSP5-8.5) from the IPCC Sixth Assessment Report, using S&P's Climanomics® model. Risks have been assessed for eight climate disasters, including acute risks (floods, wildfires, coastal/river flooding, typhoons) and chronic risks (abnormal temperatures, drought, water stress). Under the high-carbon scenario (SSP5-8.5), the disasters with the highest short-term annual average loss rates from 2020 to 2029 are abnormal temperature and heavy rain and floods. The loss rate due to abnormal temperatures is calculated considering cooling costs, productivity decline, and HVAC system degradation, while the loss rate due to heavy rain and floods is calculated considering business interruption and cleaning/repair costs. These physical risks mainly affect the 'Production and Manufacturing of Products' in Moorim's business model.

## 2) Key Areas of Risks and Opportunities

The areas concentrated with climate-related transition risks and opportunities in Moorim's business model and value chain include 1) product and technology development, 3) production and manufacturing of products, 4) sales and marketing sales and marketing and 2) raw material procurement in the upstream. Physical risks primarily concentrated in the production and manufacturing of products, with Korea being the region facing the highest financial risk.

# Strategy and Decision-Making

## (1) Current Status and Plans for Risk and Opportunity Management

### (A) Refinements in Resource Allocation for Business Model

Moorim has established and implemented resource allocation plans to build environmentally friendly facilities and process systems. These include installing eco-friendly high-efficiency recovery boiler (Moorim P&P), investing in energy-efficient facilities, and introducing solar power generation facilities (Moorim Paper, Moorim P&P).

| | |
|---|---|
| Production and Manufacturing of Products | · Invested KRW 13.8 billion from 2021 to 2024 to improve internal process energy efficiency for steam, electricity, LNG, etc.<br>· Invested KRW 280.0 billion by 2025 in installing eco-friendly high-efficiency recovery boiler (Moorim P&P) |
| Product and Technology Development | · Reorganized into a research organization focused on eco-friendly materials in 2022<br>· Established and operated research groups dedicated to research planning, as well as nano, bio, and eco-friendly sectors |

### (B) Efforts for Direct and Indirect Mitigation and Adaptation

| Risk/Opportunity | Direct and Indirect Mitigation and Adaptation Efforts | Description |
|---|---|---|
| Strengthened Regulations on Greenhouse Gas Emission Permits | Renewable Energy Production from Biomass Black Liquor | Installation of eco-friendly high-efficiency recovery boiler using biomass Black Liquor |
| | Enhancing Energy Efficiency in production Processes | Enhancing production process energy efficiency through equipment upgrades for steam, electricity, and LNG |
| | Developing renewable energy projects | Installing and operating solar power generation facilities at Moorim Paper and Moorim P&P |
| | Establishing a Management System for International Forest and Carbon Regulations | Establishing a management system for EUDR and continuously monitoring CCA and CBAM |
| | Cooperation with supply Chain and stakeholder | Establishing a supply chain ESG management system to encourage suppliers' participation in reduction |
| Expansion of the Market with Ecofriendly Products | Eco-friendly Product and Technology Development | Establishing and implementing a eco-friendly response roadmap considering the product life cycle |
| | Customizing Eco-friendly Products for Export | Developing and producing products with diversified specifications tailored to each export customer |
| | Discovering New Eco-friendly Businesses | Developing advanced materials and promoting businesses to preempt the eco-friendly market |
| Average Temperature Rises Caused by Climate Change | Establishing an Emergency Response Process | Operating the Emergency Response Committee and establishing a unified reporting system to minimize the impact of natural disasters |

#### 1) Renewable Energy Production from Biomass Black Liquor

Moorim generates steam and electricity by combusting biomass 'black liquor' from the pulp production process, reducing greenhouse gases and saving on energy costs. In 2023, this led to an estimated reduction of 800,000 tons of greenhouse gases and energy cost savings of approximately KRW 177 billion. Starting in 2025, Moorim will install a 54MW eco-friendly, high-efficiency recovery boiler, aiming to cut greenhouse gases by 100,000 tons annually.

#### 2) Enhancing Energy Efficiency in Production Processes

Moorim monitors metrics like production volume, energy consumption, and greenhouse gas emissions to inform business strategies and investments. Moorim Paper and Moorim P&P aim to cut Scope 1 and 2 emissions by 25% by 2030 compared to 2022. Efforts include:

- replacing high-efficiency motors (reducing electricity consumption)
- installing and replacing high-efficiency refiners (reducing electricity consumption)
- improving the drainage system (reducing steam consumption)

Moorim SP has strived to improve internal process energy efficiency by:

- improving energy efficiency in the PM2 dry part (reducing steam consumption) and temperature rises in boiler feed water (reducing LNG consumption)

Additionally, Moorim plans to continue replacing and improving outdated equipment to reduce emissions by 5,000 tons annually.

Moorim's Major Investments in Energy-Related Facilities (2021-2023)

| | | | |
|---|---|---|---|
| Energy Savings | Moorim Paper<br>Improving Air Compressors | Moorim SP<br>Installing PM1 Turbo Blower | Moorim SP<br>Increasing Boiler Feed Water Temperature |
| Process Optimization | Moorim Paper<br>Upgrading CM3 SCAF Nozzle | Moorim SP<br>White Water Recycling and Water Supply Dualization | Moorim P&P<br>Optimizing Sootblowers for Recovery Boilers No. 1, 2 |
| Equipment Efficiency Improvement | Moorim Paper<br>Improving PM3 Drainage system | Moorim SP<br>Improving PM1 Drainage system | Moorim SP<br>Improving Energy Efficiency in PM2 Dry Part |

# Strategy and Decision-Making

## (1) Current Status and Plans for Risk and Opportunity Management

### 3) Developing Renewable Energy Projects

Moorim Paper added renewable energy generation to its articles of incorporation in 2024, laying the foundation for carbon reduction and electricity cost savings through rooftop solar power generation. In the short term, we plan to promote rooftop solar power projects within Moorim Paper and Moorim P&P. In the mid- to long-term, we will consider procuring renewable energy through PPA projects.

### 4) Establishing a Management System for International Forest and Carbon Regulations

**Responding to EUDR Regulations**

Moorim plans to form and operate a task force with relevant departments to respond to the EU Deforestation Regulation (EUDR), which is scheduled to take effect in December 2024. EUDR is a law that regulates the introduction and export of specific goods and products related to illegal deforestation into the EU market. The regulation applies to operators who import or export related products for commercial activities such as processing, sales, and exporting within the EU market, as well as all traders in the supply chain who distribute these products after their release for commercial activities of operators. Although Moorim and Moorim UK are not directly subject to this regulation, they have proactively prepared response measures from the perspective of their buyers, who are subject to the regulation, by conducting pre-inspections and collecting data on the supply chain.

**Plan for Forming an EUDR Response Task Force**

| | | |
|---|---|---|
| EUDR Response Task Force | Overseas Sales Department | · Preparation and Submission of Due Diligence Declarations, and Response to EU Customers<br>· Support for indirect exports |
| | Purchasing Department | · Providing Geographical information of raw materials (Pulp, Chips)<br>· Gathering information on response measures from pulp manufacturers |
| | Quality Assurance Department | · Designing and verifying a plan to provide raw material information by manufacturing batch number according to the production raw material mix ratio |
| | System Operations Department | · Adopting systems provided by European manufacturers and FSC organizations<br>· Establishing a System to print Due Diligence declarations following invoice issuance<br>· System Setup, phased program design, and verification |
| | ESG Department | · Support in reviewing compliance risks related to the preparation of Due Diligence Declarations |

**U.S. CCA and EU CBAM**

(CCA) Although the adoption timing is not yet confirmed, and no short-term financial impact is expected, the CCA includes the paper industry as an energy-intensive sector. Therefore, we plan to closely monitor the changes in the system from a mid- to long-term perspective and respond promptly to any external risks that may arise upon its implementation.

(CBAM) Short-term impacts on the overall industry are not expected as the system is still in transition. However, there are plans to expand the EU Emissions Trading System to all industries by 2034. Although the application timeline for each industry has not yet been determined, we will continue to closely monitor the changes in the system, similar to our approach with the CCA.

### 5) Cooperation with Supply Chain and Stakeholders

Moorim complies with domestic and international laws and regulations to protect the environment and minimize damage. Along with our suppliers, we have established and operated an ESG supply chain management policy for sustainable growth that fulfills social responsibilities. For responsible supply chain management, we regularly or continuously conduct ESG surveys and evaluations on our suppliers, including environmental aspects such as environmental permits and reporting, pollutants, hazardous chemicals, waste, air pollution, water quality, energy, and greenhouse gas management and reduction status. In the short term, we plan to conduct regular supply chain ESG inspections and establish supply chain ESG management policies. In the mid- to long-term, we aim to expand ESG support for our suppliers and build a web-based ESG evaluation system to systematically and proactively manage carbon emissions.



# Strategy and Decision-Making

## (1) Current Status and Plans for Risk and Opportunity Management

### 6) Eco-friendly Product and Technology Development

#### Eco-friendly Strategy Roadmap

Moorim has established a eco-friendly strategy roadmap that considers the entire life cycle of products—from planning, development, production, sales, to disposal—to meet the increasingly diverse and strengthen eco-friendly product requirements of domestic and international customers. In response to the growing demand for eco-friendliness in the disposal stage of products in both domestic and overseas markets, we have launched Neoforêt products that consider eco-friendliness, biodegradability, and recyclability. We are also maintaining and expanding certifications that guarantee the eco-friendliness of related products.

Eco-friendly Strategy Roadmap



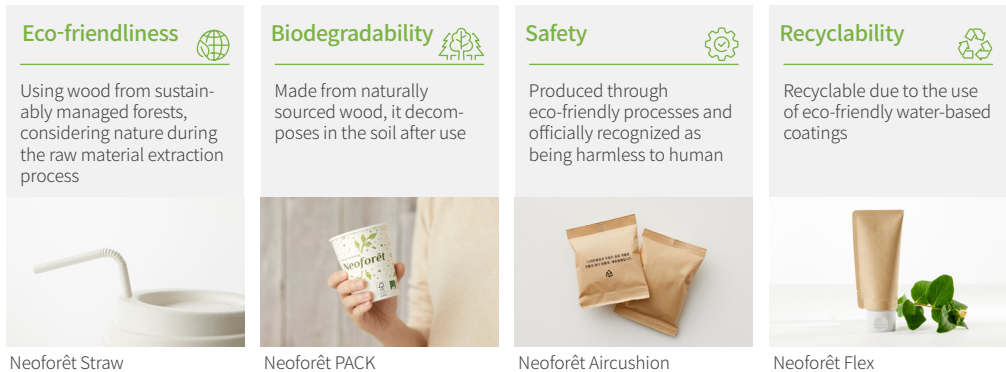

#### Awards and Certifications

Starting with the first FSC® certification among Korean paper manufacturers by Moorim Paper in 2007, Moorim has achieved several milestones: the first carbon footprint certification for coated paper in Korea in 2011, the first low-carbon product certification in Korean paper industry by Moorim P&P in 2013, and the first biodegradable certification 'OK compost' in the Korean paper industry by Moorim SP in 2020. We plan to continue developing low-carbon green products through the efficiency of production processes and technology.

#### Expansion of Sustainable Product Development (Neoforêt)

Moorim launched the brand Neoforêt in 2019, focusing on both environmental sustainability and quality. "Return to Forest", Neoforêt products are highly recognized as eco-friendly materials that can replace plastic due to their excellent recyclability and biodegradability. Moorim is developing a variety of eco-friendly products such as paper straws, cups, and aircushions that can be used in daily life, all made from natural pulp. These products are manufactured in consideration of eco-friendliness, biodegradability, safety, and recyclability. They are designed to be mindful of the planet not only during production and use but also after disposal. In the future, we plan to strengthen the marketing of Neoforêt brands and expand these product lines through continuous research and development.

Characteristics of Neoforêt Products




Neoforêt Straw | Neoforêt PACK | Neoforêt Aircushion | Neoforêt Flex

Moorim operates the only comprehensive Research Center in the country dedicated to pulp, paper and advanced materials. The center aims to establish a foundation for the advanced product technologies and diversified future business portfolio that meets eco-friendly customer demands. To achieve this, Moorim runs project groups focused on nano (nanocellulose), bio (bio-materials derived from the pulp process), and eco-friendliness (sustainable eco-friendly paper types and plastic alternatives). These groups are working on technological innovations and developing new technologies in pulp and paper to comply with global environmental regulations and meet customer demands.

# Strategy and Decision-Making

## (1) Current Status and Plans for Risk and Opportunity Management

### 6) Eco-friendly Product and Technology Development

| PG Field | Key Achievements |
|---|---|
| Nano | · Development of low-cost, process-based mass production technology for nanocellulose<br>· Development of highly dispersible nanocellulose material for automotive interior composite materials<br>· Development of a highly transparent and biodegradable nanocellulose additive for gas barrier film coatings |
| Bio | · Development of eco-friendly construction materials using pulp as an alternative to petroleum-based materials<br>· Development and prototype production of low-carbon composite materials for home appliance housings<br>· Development of eco-friendly phenolic resin and bio-asphalt technologies using lignin |
| Eco-friendliness | · Expansion of eco-friendly paper portfolio<br>· Quality differentiation to meet diverse needs of companies in demand for eco-friendly products |

### 7) Customizing Eco-friendly Products for Export

Recently, led by advanced nations, the tightening of environmental regulations for sustainable growth has highlighted the importance of paper as an alternative to plastic disposable products. In regions such as the United States and Europe, growing interest in eco-friendly products has driven an increased demand for sustainable items made from environmentally friendly materials like paper and pulp.

In response, Moorim is focusing on diversifying its export markets to achieve high profitability by enhancing and differentiating product quality, thereby securing a competitive edge in advanced markets. To meet the specific customization needs of customers in each country, Moorim is committed to producing and supplying eco-friendly products that incorporate recycled materials.

Moorim has obtained several environmental certifications, including the recyclability certification from the German testing body PTS (Papiertechnische Stiftung), the OK compost HOME biodegradable certification from the European testing body TUV (Technischer Überwachungsverein) AUSTRIA, and the PREPS certification from the UK Publishers Association, which ensures traceability of pulp sources in paper products. As the demand for product customization and certification from international customers continues to diversify, Moorim plans to actively pursue additional relevant certifications and conduct Life Cycle Assessment (LCA) impact evaluations for its key export products.

### 8) Discovering New Eco-friendly Businesses

Moorim is expanding its new business avenues by developing eco-friendly products using molded pulp. In 2023, the amenities kit package for High1 Grand Hotel was replaced with water-resistant molded pulp, replacing plastic containers and contributing to a low-carbon, green resort. Additionally, in collaboration with Kyochon F&B, Moorim developed an eco-friendly tray that requires no assembly, replacing traditional chicken boxes. This innovation enhances operational efficiency for franchise owners and achieving carbon reduction, leading to mutual growth. Moving forward, Moorim plans to identify demand and commercialize products by leveraging technological advances in the nano, bio, and eco-friendly sectors.

#### Development and Commercialization of Plastic-Alternative Materials

As part of its de-plasticization efforts, Moorim is conducting research on materials and products that can replace plastic. To proactively respond to changes in the corporate external environment, such as the reduction of plastic waste and the increase in demand for disposable products both domestically and internationally. We are collaborating with other firms to expand eco-friendly solutions such as applying Engineering Plastic (EP) natural materials to exterior parts of electronic products, developing sheet manufacturing processes, and creating wood-plastic hangers, among other initiatives, all aimed at producing plastic resins from eco-friendly materials.

#### Launch of the Eco-friendly Product Brand ‘moohae'

Moorim launched the eco-friendly brand 'moohae,' recognized as the Best Sustainable Brand at the 2023 Seoul Café Show. The molded pulp moohae is made from 100% natural raw pulp, transported through the latest sealed transfer pipes, minimizing the risk of foreign substance contamination during production. It has also received biodegradability certification and, for the first time in the industry, obtained the Food Safety System Certification (FSSC 22000), proving its world-class food safety. Moorim also introduced 'moohae Wet Tissue' product made from biodegradable 'paper fabric,' which can be disposed of as paper, replacing traditional non-woven fabrics and polyester synthetic fibers. Moorim plans to expand the moohae product line and enhance its brand value.

# Strategy and Decision-Making

## (1) Current Status and Plans for Risk and Opportunity Management

### 8) Discovering New Eco-friendly Businesses

**Research and Commercialization of Nanocellulose-Based Eco-friendly Functional Materials**

Moorim is conducting research to apply nanocellulose (cellulose nanofiber, CNF), an eco-friendly advanced material produced from its own pulp, as a functional material in various industrial fields. By establishing pilot facilities, Moorim aims to produce nanocellulose at a low cost and manufacture products of various grades according to the application fields, thereby gaining a competitive edge in cost and quality. Currently, Moorim is conducting joint research with companies to develop commercialized products using nanocellulose. The focus is on discovering and commercializing demand for nanocellulose-related products such as composite materials for automotive interiors to replace fossil fuel-derived plastics, gas barrier films for eco-friendly food packaging, eco-friendly water-based paints, paper strength enhancers, and eco-friendly textiles.


Bioplastic


Wood-plastic hanger


Molded-pulp


Nanocellulose-applied automotive interior components


Nanocellulose-applied gas barrier film

### 9) Establishing an Emergency Response Process

Moorim continuously manages and strengthens its emergency response system to quickly address emergencies caused by climate change and minimize human and physical damage. To achieve this, each business site identifies potential emergencies by department, establishes definitions and scenarios for hazardous material leaks, fires, power outages, and other incidents, and conducts emergency drills every six months. These drills are conducted jointly with suppliers, and Moorim plans to continue joint training to enhance the emergency response capabilities of its suppliers.

## (C) Climate-Related Transition Plan

Moorim acknowledges the role and responsibility of corporations in addressing global climate change and has established a carbon neutrality strategy for 2024 to systematically promote climate change response activities within its business operations. In line with global carbon neutrality policies and declarations, Moorim is identifying greenhouse gas reduction measures across the entire value chain and laying the groundwork for carbon neutrality at its business sites, including the management of Scope 3 emissions.



# Strategy and Decision-Making

## (1) Current Status and Plans for Risk and Opportunity Management

### (C) Climate-Related Transition Plan

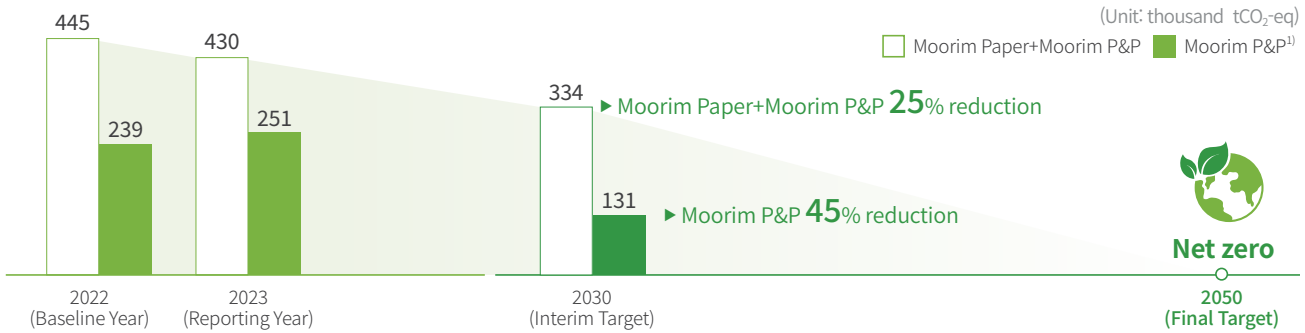
#### 1) Carbon Emission Reduction

Carbon Emissions

**2030 Mid-Term Goal** Scope 1+2 Emissions : **25**% reduction compared to '22 emissions (Moorim Paper + Moorim P&P)

Roadmap to Carbon Neutrality

**Short-Term (2023~2030)** | **Mid to Long-Term (2031~2050)**




1) As a subsidiary of Moorim Paper, Moorim P&P is specifically designated as the company primarily responsible for implementing carbon neutrality reduction initiatives, and is therefore highlighted separately.

| | 2050 Carbon Neutrality Target | Classification | | | Business site | |
|---|---|---|---|---|---|---|
| Short-Term (2023~2030) | Replacement of Eco-friendly High-Efficiency Recovery Boilers and Generators | Process Efficiency/ Improvement | Renewable Energy | Carbon Offset Project | Moorim Paper | Moorim P&P |
| | Investment in Energy Efficiency Improvements | Process efficiency/ improvement | Renewable Energy | Carbon Offset Project | Moorim Paper | Moorim P&P |
| | Solar Power Self-Generation | Process efficiency/ improvement | Renewable Energy | Carbon Offset Project | Moorim Paper | Moorim P&P |
| Mid to Long-Term (2031~2050) | Procurement of Renewable Energy | Process efficiency/ improvement | Renewable Energy | Carbon Offset Project | Moorim Paper | Moorim P&P |
| | Fuel Conversion for Steam Boilers | Process efficiency/ improvement | Renewable Energy | Carbon Offset Project | Moorim Paper | Moorim P&P |
| | Review of Implementing Alternative Low-Carbon Fuels for Other Liquid Fuels | Process efficiency/ improvement | Renewable Energy | Carbon Offset Project | Moorim Paper | Moorim P&P |
| | Review of Carbon Offset Program Implementation | Process efficiency/ improvement | Renewable Energy | Carbon Offset Project | Moorim Paper | Moorim P&P |

#### 2) Expansion of Sales of Environmentally Certified Products

Moorim plans to continue to expand sales of eco-friendly certified products by utilizing eco-labels and low-carbon certified products. Moorim is also considering promoting low-carbon certification for existing Environmental Product Declaration certified products. In addition, Moorim will maintain biodegradability certifications for products considering their post use phase. Furthermore, we plan to proactively respond to stakeholders' demands for eco-friendly products with products that are eligible for EVE VEGAN certification.

**Key Assumptions**

- Domestic and international demand for eco-friendly products
- Trends in domestic and international climate-related regulations

**Dependencies**

- Capability in developing eco-friendly advanced materials and products
- Availability of physical and human resources for promoting related plans
- Management's willingness to invest in and promote renewable energy projects
- Cooperation level of suppliers in responding to climate transition

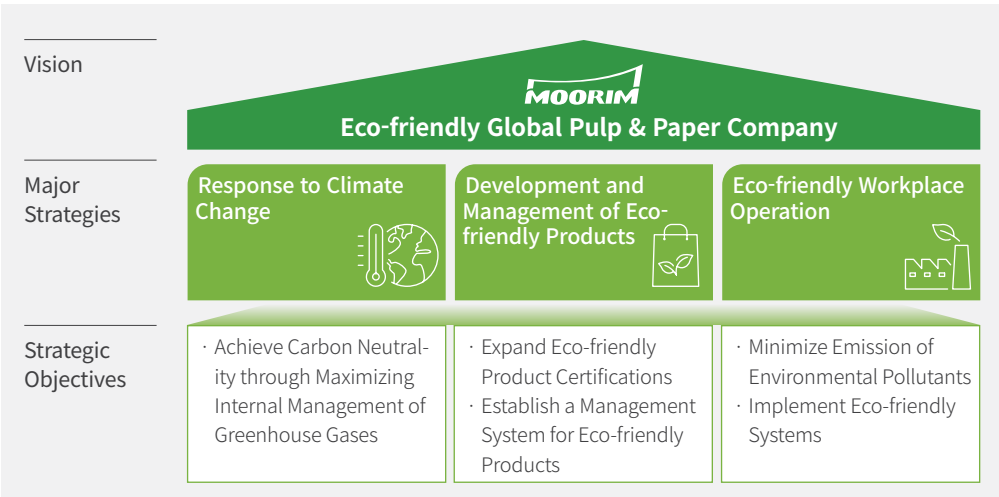
# Strategy and Decision-Making

## (1) Current Status and Plans for Risk and Opportunity Management

### (D) Plan to Achieve Climate-Related Targets (Including Greenhouse Gas Emission Goals)

Moorim has established an environmental management vision of becoming an 'Eco-friendly Global Pulp & Paper Company' and is actively practicing low-carbon management by setting up three major strategies: `Response to Climate Change', 'Development and Management of Eco-friendly Products', and 'Operation of Eco-friendly Workplaces'.

Moorim's Environmental Management Vision and Strategy




Response to Climate Change

Moorim recognizes climate change as the most significant factor affecting overall corporate management and has set the achievement of carbon neutrality through maximizing internal management for greenhouse gases as a strategic objective. Accordingly, we plan to enhance the system to effectively measure and manage greenhouse gas emission activities across the entire value chain, including internal business sites and supply chain. Furthermore, we are exploring ways to disclose goals and performance through voluntary initiatives participation to ensure that the mid- to long-term strategies for responding to climate change can be effectively measured and managed.

Development and Management of Eco-friendly Products

Moorim aims to gradually transition to an eco-friendly business portfolio in response to the global increase in demand for eco-friendly products and the diversifying market changes. To achieve this, we are planning eco-friendly products considering their life cycle, customizing the proportion of recycled materials according to customer requirements, and continuously promoting the development of biodegradable products considering post-disposal. Additionally, to strengthen market competitiveness, we plan to expand the acquisition of various domestic and international environmental certifications and review the establishment of a system to manage the increasingly diverse range of customer-tailored eco-friendly products.

Operation of Eco-friendly Workplaces

To achieve the 2050 carbon neutrality goal, Moorim Paper and Moorim P&P plan to reduce emissions by 25% by 2030 through process efficiency and self-generation. Moorim P&P aims to reduce emissions by 45% through process efficiency improvements such as replacing with eco-friendly high-efficiency recovery boilers and generators. In the mid- to long-term, we plan to continuously review and apply reduction tasks such as procuring renewable energy (direct PPA), transitioning to low-carbon fuels, and operating carbon offset programs to achieve the carbon neutrality goal by 2050.

## (2) Resource Procurement Plan

Moorim is flexibly maintaining its financial capacity by utilizing the KDB Carbon Spread Program from the Korea Development Bank (MOU signed with a KRW 270 billion), national support project policy finance, trade finance, and internal reserves to cover the costs incurred in the process of implementing direct and indirect efforts for risks and opportunities related to climate change (such as the introduction of eco-friendly high-efficiency recovery boilers, energy facility investments, solar power generation projects, and R&D investments for expanding eco-friendly products). We plan to secure funds in a timely and stable manner for activities promoting climate change response projects.

## (3) Quantitative and Qualitative Information on the Progress of Plans Disclosed in Past Reporting Periods

Please refer to (3) Analysis of Performance against Targets under the climate-related targets within metrics and targets.

# Financial Position, Financial Performance, and Cash Flow

Moorim has established a carbon neutrality roadmap to achieve low-carbon management and, to implement this, plans to expand environmental investments and sales of eco-friendly products. Accordingly, this financial impact analysis incorporates tasks that are deemed to significantly contribute to Moorim's climate goals and have a major impact on its financial status: 1) Introduction of eco-friendly high-efficiency recovery boilers, 2) Investment in energy-efficient facilities, 3) Solar power generation projects, 4) Emission permits trading, and 5) Plans to expand eco-friendly products. The analysis results may change if Moorim's strategic objectives and implementation plans are modified in response to future internal and external circumstance changes.

1



Introduction of Eco-friendly High-Efficiency Recovery Boilers

2



Investment in Energy-Efficient Facilities

3



Solar Power Generation Projects

4




Emission Permits Trading

5



Expansion of Eco-friendly Products

## (1) Impact on the Current Financial Statements

Moorim identifies the increase in emission permit prices due to the strengthened regulations on greenhouse gas emission permits as a climate-related transition risk that impacts finances from a mid- to long-term perspective. To proactively respond to this, Moorim is continuously expanding its investments in the environmental sector. As of 2023, environmental investment costs amounted to KRW 950 million for Moorim Paper, KRW 3.09 billion for Moorim P&P, and KRW 1.59 billion for Moorim SP. These investments contribute not only to the actual reduction of emissions for each company but also to the reduction of energy consumption costs (electricity, steam, LNG, etc.) through improved energy efficiency. The environmental investment costs for Moorim SP include investments[1)] that were not completed and thus not incorporated in the 2024 Moorim Sustainability Management Report.
In addition, Moorim recognizes the global trend of free plastic use and the market expansion of eco-friendly products, considering the entire lifecycle from production to disposal, as climate-related transition opportunities. By expanding eco-friendly certified products domestically and internationally and investing in the development of related products, Moorim is continuously increasing the proportion of sales[2)] from eco-friendly products.

1) The 2023 environmental investment costs do not include investments that were not completed due to equipment installation and renovation.
2) The proportion of sales from eco-friendly products increased from 44% in 2022 to 48% in 2023, an increase by 4%p.

## (2) Impact on the Financial Statements of the Next Fiscal Year

Moorim has reviewed the climate change-related risks and opportunities that could cause significant adjustments to the assets and liabilities in the next fiscal year. We have identified that there is no risk of exceeding the allocated emissions until the end of the third phase of the emissions trading system (2021-2025). Therefore, there will be no significant impact on the book value of liabilities due to additional purchases of emission permits in the next fiscal year. However, as the free allocation ratio of emission permits is expected to decrease after the third phase, temporary capital expenditures and increase in operating costs are anticipated for activities to reduce emissions, such as the renovation of power and steam production facilities for efficiency (Moorim Paper, Moorim SP), the additional adoption of eco-friendly high-efficiency recovery boilers (Moorim P&P), and the introduction of self-generating facilities using solar energy (Moorim Paper, Moorim P&P).

# Financial Position, Financial Performance, and Cash Flow

## (3) Impact on Financial Position, Financial Performance, and Cash Flow in the Short-, Mid-, and Long-term

The investment costs for the expansion and renovation of utility facilities and the introduction of renewable energy facilities are expected to be offset by the effects of emission reductions and energy consumption savings from a mid- to long-term perspective.

| Climate-Related Risks and Opportunities | | Plans to Secure Funds to Be Used in Strategy and Strategy Execution | Pathways Affecting Financial Position, Financial Performance, and Cash Flow | Detailed Impact |
|---|---|---|---|---|
| Category | Definition | | | |
| Transition Risk | Strengthened Regulations on Greenhouse Gas Emission Permits | Efficiency in energy consumption through renovation of power and steam production facilities using government support projects and internal reserves | Although a temporary increase in operating expenses for facility improvements is expected, it is anticipated to be offset due to energy cost savings from a mid- to long-term perspective. | To achieve the mid- to long-term carbon neutrality goals, we have adopted an energy efficiency strategy and are realizing short-term energy savings, aiming for a 1% reduction each year. However, considering the wide range of variables and the difficulty of accurate measurement in these estimates from a mid- to long-term perspective, quantitative information has been excluded. In the future, we plan to enhance systematic data collection and management plans internally to provide reliable quantitative information. |
| | | Reduction of emissions through the introduction of eco-friendly high-efficiency recovery boilers (Moorim P&P) supported by the KDB Carbon Spread Program and internal reserves | In the short term, a temporary increase in capital expenditures is expected due to the introduction of new facilities. However, flexible fund management is possible through the use of policy finance, and it is expected to contribute to the decrease in emission liabilities through emission reduction from a mid- to long-term perspective. | Moorim P&P has introduced a recovery boiler that produces black liquor as renewable energy in its production process, which has been recognized as a zero-emission energy source, and plans to gradually expand its introduction in phases. This is a key strategy for Moorim to achieve net-zero, and despite the high initial investment cost, it is expected to yield high economic benefits in the mi- to long-term. However, as with other strategies, quantitative information has been excluded considering the uncertainties of parameters at the point of the reporting period, such as changes in the proportion of paid allocation due to the strengthened emission regulations. We plan to provide reliable quantitative information by enhancing calculation methods in the future. |
| Transition Risk | Strengthened Regulations on Greenhouse Gas Emission Permits | Transition to a renewable energy through self-generation by promoting solar power generation project utilizing government support programs (Moorim Paper, Moorim P&P) | Although a temporary capital expenditure is expected due to the introduction of new facilities, it is possible to reduce emission liabilities through self-generation of renewable energy and generate non-operating income from the REC sales in case where surplus REC is incurred. | The solar power generation project is currently under review for adoption, and the scale and effects of the introduction are being estimated. However, due to the high uncertainty of parameters at the point of the reporting period, such as changes in the proportion of paid allocation, quantitative information has been excluded.<br>In the future, we plan to provide reliable quantitative information through the concretization of the government's emission permit regulation plans and the advancement of internal business promotion plans. |
| | | Transition of energy procurement to a renewable energy through the conclusion of renewable energy supply contracts (PPA, etc.) | According to the terms of the PPA contract, there may be additional costs incurred after the conclusion of the contract, depending on whether the lease element is included. It is expected that these costs will be offset by the decrease in emissions liabilities associated with renewable energy procurement and the reduction in operating expenses resulting from the income generated. | We are considering the point of review for the adoption of PPA as a mid- to long-term time frame. As the financial impact may vary depending on the conditions and scale of the contract, we will internally develop a plan for adoption and review economic feasibility before providing quantitative information. |

## (4) Sources of Funding Planned to Implement the Strategy

For detailed information on funding for strategy execution, please refer to the resource procurement plan for strategy and decision-making.

# Climate Resilience

## (1) Implications of Corporate Evaluation on Strategy and Business Model

| Category | Description | |
|---|---|---|
| **Strengthened Regulations on Greenhouse Gas Emission Permits** | Evaluation Implications | It is anticipated that the emissions trading system will be strengthened by reducing the proportion of free allocations, leading to increase in costs for purchasing emission permits and emission liabilities for companies exceeding their emission allowances. Moorim is also subject to this system, and scenario analysis results indicate that maintaining BAU (Business As Usual) emission levels could result in mid- to long-term financial risks for emission liabilities ranging from a minimum of approximately KRW 4.1 billion to a maximum of approximately KRW 13.8 billion as of 2030. (Assuming 50% free allocation) |
| | Response Plans | To proactively address the mid- to long-term financial risks due to the strengthened emission regulations, Moorim has established a 2050 carbon neutrality roadmap. We are establishing and implementing greenhouse gas reduction tasks such as introduction of high-efficiency facilities, increased usage of renewable energy, and transitioning to low-carbon fuels. If reductions are realized as planned, the risks affecting the overall corporate management is not possibly occur. |
| **Expansion of the Market with Eco-friendly Products** | Evaluation Implications | To overcome the growth limitations of the domestic paper industry, Moorim is seeking a breakthrough in the industry through eco-friendly products. With the global expansion of eco-friendly consumer trends, the demand for eco-friendly products in the packaging market is also increasing and is expected to grow by 7.7% annually by 2030. In particular, the non-eco-friendly plastic and paper market, which can be considered a potential market, is estimated to be worth approximately KRW 548 trillion. |
| | Response Plans | Moorim recognizes the changes in the domestic and international pulp and paper industry markets and the strengthened environmental regulations on plastic disposable products as opportunities. We are actively pursuing the research and development of technology-intensive paper products and the continuous acquisition of eco-friendly product certifications. As of 2023, the sales volume of environmentally certified products accounted for 48% of the total sales (based on the sum of the three companies). Currently, Moorim's efforts and achievements in eco-friendly product innovation and the exploration of new eco-friendly businesses across all industries are expected to lead to securing competitiveness in the domestic and international eco-friendly markets in the future. |
| **Physical Risk** | Evaluation Implications | According to the IPCC SSP scenario analysis, assuming a 4.0°C temperature rise due to 8 major climate factors (heavy rain and floods, abnormal temperatures, coastal flooding, drought, wildfires, typhoons, water stress, river flooding) under the extreme scenario SSP5-8.5, the total annual average loss rate for Moorim's three major business sites is projected to gradually increase from 3.31% for 2020-2029, 4.57% for 2030-2039 to 5.92% for 2040-2049. The impact analysis by climate factor predicts that abnormal temperatures and heavy rain and floods will cause the highest losses in the future. However, this scenario analysis is based on global weather data and models extreme weather phenomena that may occur in the future, and may not necessarily align with the actual disaster cases (type, frequency, intensity, etc.) experienced at each business site of the corporate. |
| | Response Plans | Moorim is continuously exploring various countermeasures to prepare for extreme climate changes, ensuring that emissions and productivity at each business site are not affected. Measures under consideration include activities to prevent heat-related illnesses during the summer, installation of portable air conditioners, provision of personal fans and saline glucose for workers. Additionally, through crisis management manuals and emergency response training, we plan to enhance our capabilities to minimize losses caused by major disasters resulting from climate change. |

# Climate Resilience

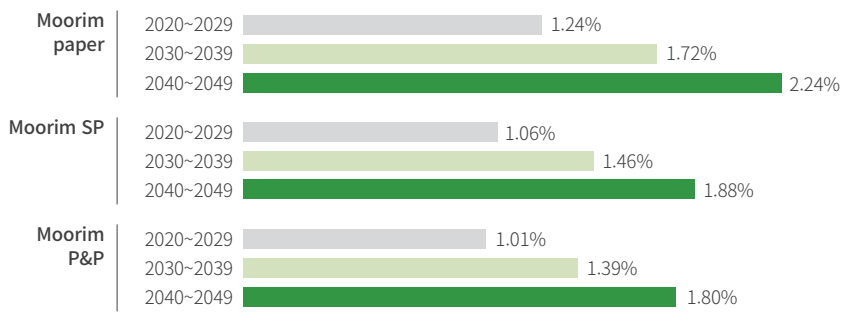
## (1) Implications of Corporate Evaluation on Strategy and Business Model

### Financial Impacts of Physical Risks

In the scenario analysis for physical risks, we utilized the globally recognized climate modeling tool, S&P Global Climanomics®(*), to calculate the financial loss rates for Moorim's three major business sites (Moorim Paper, Moorim P&P, Moorim SP according to eight climate factors. S&P Global Climanomics® references the SSP scenarios from the IPCC 6th Assessment Report. In this analysis, we divided the analysis periods into 2020-2029, 2030-2039, and 2040-2049 for the extreme scenarios SSP1-2.6 and SSP5-8.5.
The period-specific analysis results for the three major business sites of Moorim under the extreme scenario SSP5-8.5 assuming a 4.0°C temperature rise are as follows.

(*) The purpose of the S&P Global Climanomics® Hazard analysis is to understand and prepare for the maximum level of financial impacts by modeling extreme weather phenomenon, given the increasing difficulty and uncertainty in predicting future disasters due to climate change. Therefore, the corporate's physical risk analysis is not necessarily a forecast that specific weather phenomenon will prominently occur in the future. It is based on scenarios and weather data developed and used by the scientific community to model potential future extreme weather phenomenon, and may not necessarily align with the perceptions based on the actual disaster incidents experienced at each business site of the corporate or perceptions or common knowledge such as the climate characteristics of the region where the business site is located.

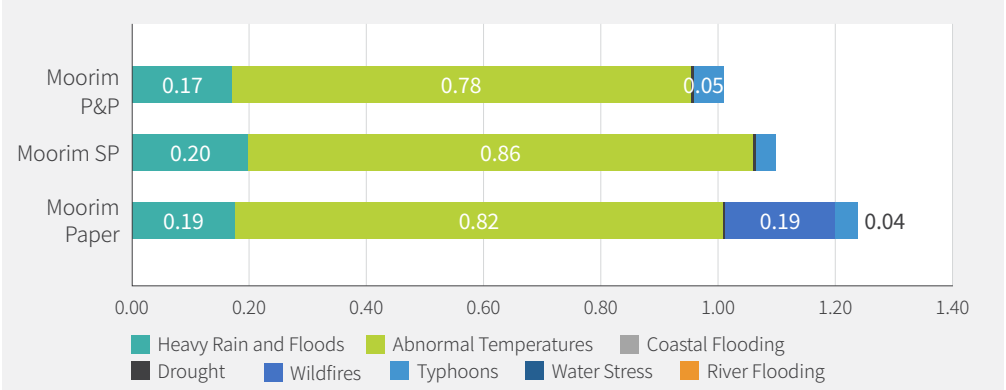
SSP5-8.5 Scenario




The analysis of the average annual loss rate by disaster for major business sites during the period from 2020 to 2029 under the SSP1-2.6 scenario commonly showed high proportion for abnormal temperatures and heavy rain and floods. On average, across three business sites, the loss rate due to abnormal temperatures accounted for 75% of the total losses, indicating that these are the physical disasters that have the greatest impact on overall losses. The components of losses for each disaster are as follows.

| Abnormal Temperatures | Heavy Rain and Floods, Coastal and River Flooding | Wildfires | Typhoons |
|---|---|---|---|
| Increased temperature maintenance costs + Decreased labor productivity + Additional installation costs due to deterioration of air conditioning systems | Opportunity costs due to operational interruptions + Repair and restoration costs due to flooding | Repair and restoration costs due to fire + Opportunity costs due to operational interruptions | Opportunity costs due to operational interruptions + Asset repair and restoration costs |

SSP1-2.6 Scenario : Loss Rates for Major Business Sites 2020-2029 (%)



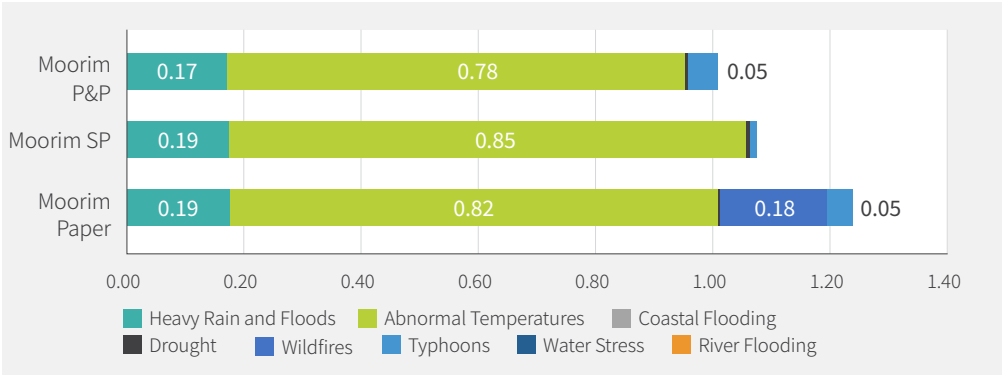

The analysis of the average annual loss rate for major three business sites during the period from 2020 to 2029 under the SSP5-8.5 scenario commonly showed high proportion for abnormal temperatures and heavy rain and floods, consistent with the SSP1-2.6 scenario. The loss rate due to abnormal temperatures accounted for 74% on average across the three business sites, and heavy rain and floods accounted for 17%, with no significant difference identified compared to the SSP1-2.6 scenario. However, in the case of the Moorim Paper business sites, physical disaster caused by wildfires is solely predicted in both scenarios. This is analyzed to be due to the fact that, based on the land cover data of the site, at least 50% of the area within a radius of 2.7 km from the site is composed of vegetation, indicating the identified risk of wildfire.

# Climate Resilience

## (1) Implications of Corporate Evaluation on Strategy and Business Model

### Financial Impacts of Physical Risks

SSP5-8.5 Scenario : Loss Rates for Major Business Sites 2020-2029 (%)




### (A) Areas of Significant Uncertainties Considered in the Climate Resilience Evaluation

| | Cost of Carbon | Proportion of Paid Allocations | Climate Model | Financial Loss Model |
|---|---|---|---|---|
| Definition | Future Carbon Prices Announced by IEA Scenarios | National Allocation Plan for Emissions During the Planning Period | IPCC's Climate Change Prediction Model | Model of the Relationship Between Physical Risks and Financial Losses |
| Uncertainty | Carbon-related price volatility by country | Possibility of reducing free allocation ratio | Inherent uncertainties in the pathways and impacts of climate change due to the complexity of the climate system and the limitations of predictions | Potential gaps between actual financial impacts and those simplified or assumed during the financial modeling process |

### (B) Corporate's Ability to Adjust or Adapt its Strategies and Business Models for Climate Changes in the Short-, Mid-, and Long-term

Moorim is committed to establishing eco-friendly business practices to mitigate climate change risks. This includes gradually introducing high-efficiency, eco-friendly boilers to convert biomass into renewable energy and enhancing internal process energy efficiency. Additionally, Moorim is innovating and developing new products in pulp and paper to address climate impacts at the disposal stage. The company remains flexible in adjusting strategies and business models to adapt to climate changes, with plans to expand the application of its products across various industries.

| | |
|---|---|
| Availability and Flexibility of Financial Resources | Moorim has established mid- to long-term carbon neutrality goals with phased implementation plans. We have assessed the timing, scale, investment costs, and funding for initiatives such as enhancing internal process energy efficiency and expanding eco-friendly high-efficiency recovery boilers. In 2023, Moorim P&P signed an MOU with the Korea Development Bank (KDB) for the 'KDB Carbon Spread Program for ESG Investment Cooperation,' securing KRW 270 billion in policy finance support. These funds are designated for expanding eco-friendly high-efficiency recovery boilers, with no significant uncertainties regarding their availability. For internal process energy efficiency, we have utilized national support projects like the carbon-neutral facility support project, trade finance, and internal reserves. Future expansion costs are also expected to be stably secured through these means. |
| Capability of Managing Existing Assets | Moorim has established improvement plans to enhance energy efficiency in processes to reduce greenhouse gas emissions from existing business sites. In addition, we have adopted a strategy to gradually transition existing facility assets to respond to climate change, such as converting 'black liquor,' a biomass fuel generated in the pulp production process, into renewable energy and using it as the main energy source for processes. We determine that we can strategically respond to future climate-related changes by improving these existing assets. |
| Impact of Current and Planned Investments | Moorim perceives the strengthened environmental regulations due to climate change as an opportunity and is focusing on the technological innovation of the existing pulp and paper and the development of new technologies, in order to expand its business scope to the overall consumer goods industry, as well as pulp and paper industry. We plan to continue to invest in R&D in the mid- to long-term. Such strategic decision-making, considering the enhancement of the corporate's future value in response to climate change, is expected to positively impact the corporate's adaptability and resilience to climate change. |

# Climate Resilience

## (1) Implications of Corporate Evaluation on Strategy and Business Model

### (C) Climate Resilience Evaluation

Moorim anticipates that achieving climate-related targets will significantly mitigate the financial impact related to emission regulations which are included in transition risks. In particular, in case where emissions are reduced based on the 2050 carbon neutrality roadmap, we expect to minimize the purchasing cost of emission permits compared to the Business As Usual (BAU) as of 2030. In addition, we aim to capture opportunities by actively developing sustainable products and technologies to alertly respond to changing market conditions. Therefore, Moorim is determined to possess flexible climate resilience capabilities to adapt to climate-related changes, developments, or uncertainties through the implementation of carbon neutrality and entry into the eco-friendly market, leading to reduced emission costs and increased sales.



## (2) Methods of Conducting Climate-Related Scenario Analysis

### (A) Information on Inputs Used by the Corporate

| Scenario | Definition | | Reason for Decision | Period Range | Source | Scope of Business |
|---|---|---|---|---|---|---|
| Transition | NZE (Net Zero Emissions) | Scenario for achieving net-zero $CO_2$ emissions in the global energy sector by 2050 | The NZE 2050 scenario by the International Energy Agency (IEA) focuses on the transition risks towards a 1.5°C society to achieve net-zero emissions by 2050, and it is considered the most suitable when taking into account Moorim's 2050 carbon neutrality roadmap. | ~2050 | IEA World Energy Outlook | Moorim Paper, Moorim P&P |
| | APS (Announced Pledges Scenario) | Scenario assuming that all climate commitments made by governments worldwide, including the Nationally Determined Contributions (NDCs) and long-term net-zero goals, will be fully and timely met | | | | |
| | STEPS (Stated Policies Scenario) | Scenario incorporating the current policy settings based on sectoral assessments for specific policies currently in place and those announced by governments | | | | |
| Physical | SSP1-2.6 (Shared Socioeconomic Pathways) | A strong carbon emission reduction scenario | The Shared Socioeconomic Pathways (SSP) scenario agreed upon by the International Panel on Climate Change (IPCC) analyzes potential future climate outcomes based on assumptions about human economic development and emission pathways, grounded in scientific climate models and data. It was deemed most suitable for reviewing Moorim's physical risks. | ~2049 | IPCC 6th Report | Moorim Paper, Moorim SP, Moorim P&P |
| | SSP2-4.5 | A moderate carbon emission reduction scenario | | | | |
| | SSP5-8.5 | Carbon Emission Doubling Scenario by 2050 | | | | |

# Climate Resilience

## (2) Methods of Conducting Climate-Related Scenario Analysis

### (B) Key Assumptions Used in the Analysis



**Policy**

50% free allocation ratio under South Korea's greenhouse gas emissions trading system[1)]



**Macroeconomics**

Prospects for boosting the eco-friendly paper industry, including replacing fossil fuel-derived plastics



**National/Regional Level**

Projected Carbon Price Increase by Country ($42-$140 by 2030, Scenario-Based)



**Energy Use and Mix**

Price Trends by Fuel Type (Electricity, LNG, Renewable Energy prices, etc.)



**Technology Development**

Growth of eco-friendly markets driven by advanced material development and commercialization

1) According to the system, the government allocates emission permits on an annual basis to business sites that emit greenhouse gases, allowing them to emit within the allocated range. It evaluates the actual greenhouse gas emissions of the business sites and permits trading of surplus or deficit emission permits between business sites.

### (C) Period of Conducting Analysis

Moorim conducted a climate-related scenario analysis during the current reporting period.



# RISK MANAGEMENT

Climate-Related Risk and Opportunity Management Process 37
Integration with Company-wide Risk Management System 39

# Climate-Related Risk and Opportunity Management Process

## (1) Inputs and Parameters

| Inputs and Parameters | Range of Business Sites | Data Source |
|---|---|---|
| Carbon Price | Moorim Paper<br>Moorim SP<br>Moorim P&P | IEA World Energy Outlook 2023 |
| GHG Emissions Trend | | Data presented by the Company |
| Energy Consumption | | Data presented by the Company |
| Type of Business Sites | | Data presented by the Company |
| Geographical Characteristics by Business Site | | Data presented by the Company |

## (2) Identification of Climate-Related Risks and Opportunities

Moorim has identified the impact of potential risks and opportunities that climate change may have on the company through climate scenario analysis, and is utilizing it to strengthen our climate change response activities and management system of risks and opportunities

## (3) Climate-Related Risk and Opportunity Assessment Method

Moorim utilizes scenario analysis based on various scenarios to analyze the impact of climate change on its business operations. In this process, climate-related risks and opportunities are identified and assessed to prioritize them. We design impact pathways for major risks and opportunities to identify the impact and conduct both qualitative and quantitative analyses. To ensure the objectivity and expertise of the analysis, we receive advisory from external expert groups such as consultants, and have actively incorporated the internal stakeholders' assessments. For physical risks, we conducted a more sophisticated evaluation by using the climate analysis tool, S&P Climanomics®. Through this comprehensive analysis, the financial impacts of each climate scenario are specifically calculated. Based on these results, we identify key climate risks and orpportunites and assess response strategies to mitigate risk and enhance resilience.

### (A) Impact Assessment

#### (a) Transition Scenario Analysis

| | | | |
|---|---|---|---|
| 1 Impact Assessment on the Corporate's Business Model and Value Chain | 1-1 Procure-ment | Impact on strategies or plans of procuring major raw materials and components<br>· Impact of raw materials and components procuring country location<br>· Impact of raw materials and components supply and demand | Assessment through interviews with internal and external experts |
| | 1-2 Produc-tion | Impact on strategies or plans of producing products<br>· Impact of assets held/developed for manufacturing/ development | |
| | 1-3 Sales | Impact on strategies or plans of selling products<br>· Impact of revenue generating regions/countries<br>· Impact of sales and marketing<br>· Impact of purchasing customers | |
| 2 Impact Assess-ment on the Cor-porate's Resource Allocation | 2-1 | Impact on Moorim's management strategy establishment<br>· Impact of budgeting, talent acquisition, and asset acquisition<br>· Impact of investment and R&D | Assessment through interviews with internal and external experts |

#### (b) Physical Scenario Analysis

| | |
|---|---|
| Evaluation Method | Quantitative Assessment<br>Measuring the financial impact of climate-related physical risks using the S&P Climanomics® analysis technique |

# Climate-Related Risk and Opportunity Management Process

## (3) Climate-Related Risk and Opportunity Assessment Methods

### (B) Assessment of Uncertainty

Moorim considered the possibility to occur of each risk factor's impact on the company and industry. Low uncertainty indicates that the factor's impact is predetermined or predictable, while high uncertainty indicates having difficulties in predicting the factor's impact on a specific company and industry.

## (4) Priority of Climate-Related Risks and Opportunities Compared to Other Sustainability Risks

In 2024, the double materiality assessment identified 'Response to Climate Change, 'Sustainable Product and Technology Development', and 'Strengthening of workplace safety/health management' as the top three high-impact issues, with 'Response to Climate Change' as the top priority. The results of the materiality assessment are reported to the management and the board of directors and are reflected in the company's ESG management activities. Furthermore, the Sustainability Report provides a transparent communication channel for stakeholders by disclosing the key activities and performance for each issue.

## (5) Monitoring of Climate-Related Risks

Moorim plans to identify and manage climate change risks and opportunities in the value chain across the business by each relevant department, with regular annual reports to the board directors for management and supervision. Non-financial risk management activities, such as the establishment and revision of ESG policy manuals, environmental indicators, human rights impact assessments, and evaluations of partner companies' performances, are reported to and approved by the CEO and the Board of Directors on a quarterly basis. The ESG risk management shall be carried out by all employees, and the goal setting, analysis, and evaluations for each risk are performed by the head of the department where the risks are held and generated.

Global regulations are monitored by overseas local subsidiaries (U.S., Europe, etc.), and when changes in laws/policies occur, relevant departments jointly respond. In addition, we have established an emergency response system that can respond at all times in anticipation of potential disasters. We are operating an emergency response system that is always in place when a disaster is predicted, and the status of product management and factory facilities is reported to the headquarters and then reported to the management.

## (6) Changes in Risk Management Processes

There are no changes during the reporting period as we conducted our first scenario analysis .

# Integration with Company-Wide Risk Management System

Moorim enhances the soundness, reliability, and safety of its management by controlling financial and non-financial risks that significantly impact management. Financial risks are managed through the internal accounting control system, while non-financial risks are minimized by implementing eco-friendly management, social responsibility, and transparent governance based on ESG risk management regulations. Each risk is identified and managed by the heads of the departments where each risk is likely to occur. In 2024, Moorim plans to identify and address high-risk, and to establish and gradually implement processes for risk management by type. In particular, we classify and identify physical/transition risks due to climate change into short-, mid- and long-term periods depending on the materiality of the impact on the business operations, and the possibility of occurrence and financial impacts are quantitatively analyzed through scenario analysis.

STEP 1 | STEP 2 | STEP 3 | STEP 4

## Identification of Risk and Opportunity



Moorim has established a risk identification system that qualitatively and quantitatively evaluates the impacts of physical and transition risks and opportunities by climate scenario according to short-, mid-, and long-term periods based on TCFD recommendations. In particular, for key issues, we aim to derive quantitative financial impacts to establish more effective management measures.

## Risk Management and Response



Moorim has established and operates an organizational structure and dedicated organizations for each division to manage the impacts of climate change.
These organizations are responsible for performing activities to achieve the goals set in the climate change response strategy. Through this, Moorim not only responds to laws and regulations but also considers climate factors when setting business directions and making large-scale facility investments.
Furthermore, we identify and manage the financial opportunities and risks associated with carbon credit, and has established an inventory system to collect and manage activity data for emissions management in response to climate change.

## Monitoring and Assessment

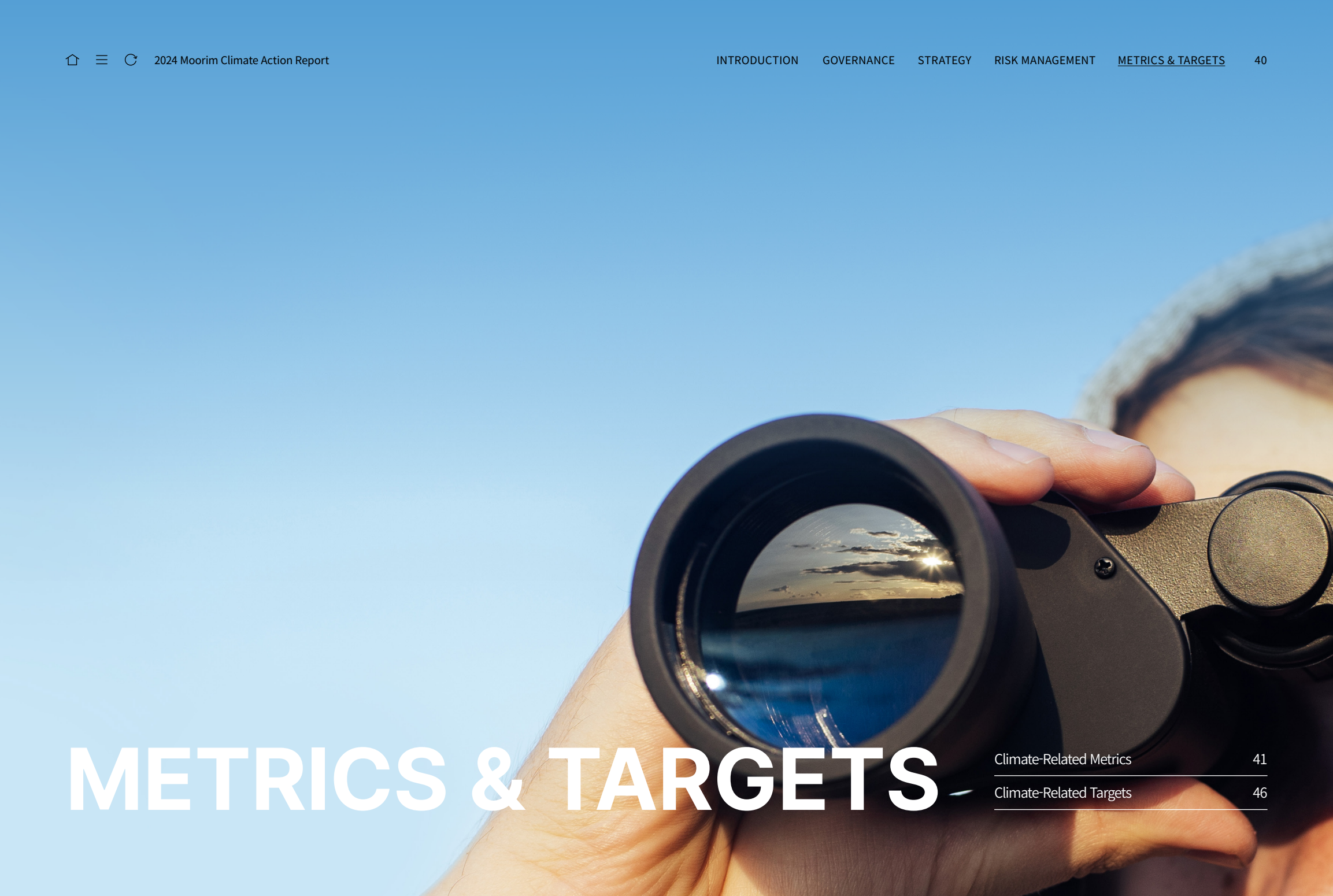


Moorim plans to identify and manage climate change risks and opportunities in the value chain across the business by each relevant department, with regular annual reports to the board of directors for management and supervision.

## Updates and Reporting



The scenario analysis results are disclosed and reported internally and externally through the Sustainability Report and other relevant documents.



# METRICS & TARGETS

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# Climate-Related Metrics

## (1) Greenhouse Gases

### (A) Absolute Total Emissions (Region-Based)

(Unit: $tCO_2$-eq)

| Category | 2022 | | | 2023 | | |
|---|---|---|---|---|---|---|
| | Moorim Paper | Moorim SP | Moorim P&P | Moorim Paper | Moorim SP | Moorim P&P |
| Scope 1* | 9,813 | 26,828 | 102,889 | 8,479 | 26,825 | 112,634 |
| Scope 2* | 195,890 | 21,549 | 136,057 | 170,190 | 20,088 | 139,025 |
| Scope 3* | - | - | | 284,625 | 93,379 | 500,304 |
| C1 Purchased Goods and Services | | | | 115,750 | 42,938 | 186,032 |
| C2 Capital goods | | | | 1,667 | 734 | 23,613 |
| C3 Fuel-and-Energy-Related Activities | | | | 16,098 | 4,250 | 43,849 |
| C4 Upstream Transport & Distribution | | | | 11,128 | 3,243 | 17,072 |
| C5 Waste Generated in Operations | | | | 956 | 167 | 4,124 |
| C6 Business Travel | | | | 177 | 31 | 275 |
| C10 Processing of Sold Products | | | | 116,002 | 36,336 | 162,217 |
| C12 End-of-Life Treatment of Sold Products | | | | 22,848 | 5,680 | 63,121 |

* Aggregation scope: Moorim Paper, Moorim SP, Moorim P&P

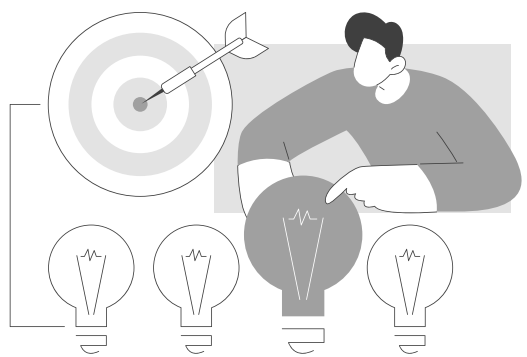
### (B) Approach for Emission Measurement

The guidelines applied by Moorim for measuring greenhouse gas emissions are as follows.

| Category | Guidelines |
|---|---|
| Scope 1, 2 | Korea GHG and Energy Target Management System Operating Guidelines<br>Greenhouse Gas Protocol (GHG): A Corporate Accounting and Reporting Standard (Revised Edition)<br>IPCC Guidelines for National Greenhouse Gas Protocol and Accounting Tool<br>Korea GHG and Energy Target Management System Operating Guidelines |
| Scope 3 | Greenhouse Gas Protocol: Scope 3 Guidance<br>Corporate Value Chain (Scope 3) Accounting and Reporting Standard |

Moorim is subject to the Korea Emissions Trading System (K-ETS) as regulated by the “Act on the Allocation and Trading of Greenhouse-Gas Emission Permits”. When measuring Scope 1 and 2 emissions under this Act, we applied the "Guidelines for Reporting and Certification of GHG Emissions Trading System" and "ISO 14064-1 (2018)" for domestic operations. For Scope 3, the GHG Protocol was applied.

Moorim used the operational control method at the business site level as the measurement approach in accordance with the [Appendix 4] Determining Organizational Boundaries in the "Guidelines for Reporting and Certification of GHG Emissions Trading System”.



# Climate-Related Metrics

## (1) Greenhouse Gases

### (B) Approach for Emission Measurement

Inputs & Key Assumptions and Reasons

| Category | Inputs | | | | | Key Assumptions and Reasons |
|---|---|---|---|---|---|---|
| | Activity Data | | | Emission Factor | | |
| | Description | Type* | Verfication | Description | Source | |
| Scope 1 | Fuel consumption | Primary | - | Emission factors by greenhouse gas type | Tier 2 Country Specific Fuel Emission Factor | - |
| Scope 2 | Electricity or heat (steam) consumption | Primary | - | Article 15 of the Guidelines for Reporting and Certification of Emissions under the Greenhouse Gas Emissions Trading System | Tier 2 Country Electricity Emission Factor | - |
| Scope 3 | | | | | | |
| C1 Purchased Goods and Services | Production volume of products calculated by the Environmental Product Declaration (Moorim Paper & Moorim P&P) | Primary | | Pre-manufacturing emission factor approved by the Environmental Product Declaration | Environmental Product Declaration | - |
| | Inventory assets in the Material Stock and Purchase Ledger | Secondary | | Emission factor by industry | US EPA | |
| | Selling and administrative expenses related to services purchased from outside the organizational boundary in the trial Balance | Secondary | | Emission factor by industry | US EPA | |
| C2 Capital Goods | Acquisition amount for the current year in the statement of property, plant and equipment | Secondary | - | Emission factor by industry | US EPA | - |
| C3 Fuel-and-Energy-Related Activities | Fuel consumption | Primary | - | Emission Factor by Fuel | LCI DB (Ministry of Environment) | Supplementing the upstream emission factor of electricity by considering domestic power upstream and generation stage emission factors, as well as transmission and distribution loss rates |
| C4 Upstream Transport & Distribution | Costs paid to external companies for transportation and logistics in the trial Balance | Secondary | | Emission factor by means of transport | US EPA | |
| C5 Waste Generated in Operations | Waste treatment methods and amounts | Primary | - | Emission factor by waste type and treatment method | LCI DB (Ministry of Environment) | - |
| C6 Business Travel | Costs paid to external transportation services for business travel in the trial Balance | Secondary | - | Emission factor by means of transport | US EPA | - |
| C7 Employee Commuting | Excluded from calculation as being included in Scope 1 and 2 | | | | | |
| C8 Leased Assets | Excluded from calculation as being included in Scope 1 and 2 | | | | | |
| C9 Downstream Transition & Distribution | Not applicable | | | | | |
| C10 Processing of Sold Products | Revenue | Secondary | - | Emission factor for printing | US EPA | |
| C11 Use of Sold Products | Inadequate emissions | | | | | |
| C12 End-of-Life Treatment of Sold Products | Production volume | Primary | - | Emission factor for waste recycled paper for Environmental Product Declaration | LCI DB (Ministry of Environment) | |
| C13 Leased Assets | Not applicable | | | | | |
| C14 Franchise | Not applicable | | | | | |
| C15 Investment | Not applicable | | | | | |

* Primary: Data provided by suppliers or other entities related to specific activities in the value chain (data from meter readings, utility bills, or other methods that represent specific activities in the value chain), Secondary: Industry average data provided by third-party data providers (data from publicly available databases, government statistics, literature studies, and industry associations)

# Climate-Related Metrics

## (1) Greenhouse Gases

### (C) Scope 3 Emissions

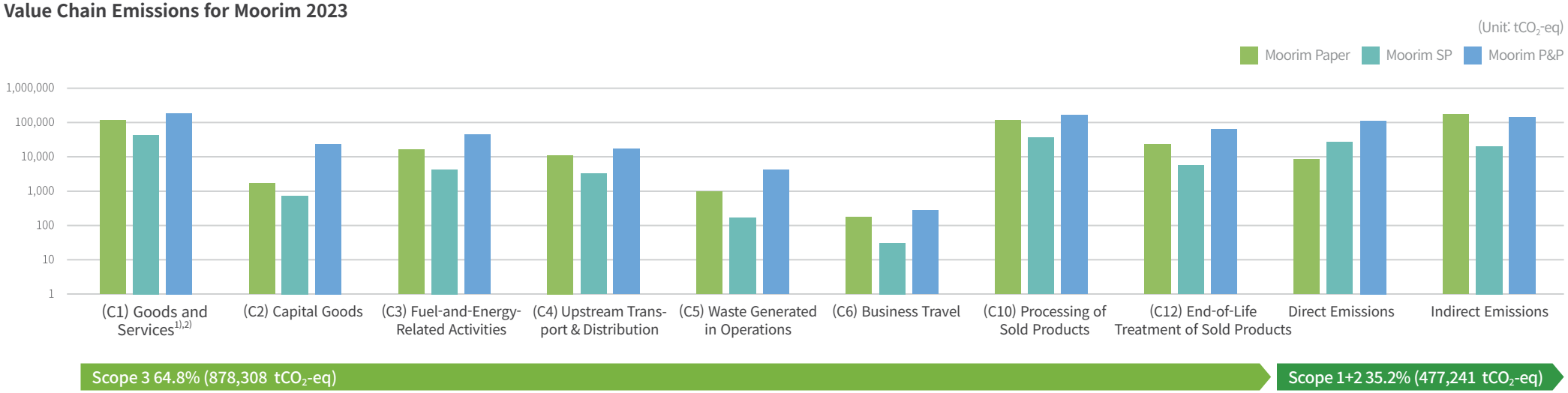
**Scope 3 Calculation Overview**

Scope 3 is other indirect GHG emissions that occur across the value chain outside of a company's organizational boundaries. Moorim calculated GHG Scope 3 in order to take the lead in responding to global disclosure obligations and expand the scope of climate response management. The organizational boundary was set based on the operational control of the control approach, which is calculated based on each company. The calculation guidelines were based on the 'GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)', 'Technical Guidance for Calculating Scope 3 Emissions', etc.

**Scope 3 Category Screening**

Moorim conducted a category screening for companies within the organization's boundaries to determine the relevance of emissions activities based on the characteristics of their business model and value chain. As a result of the screening, the categories of GHG emissions are C1, C2, C3, C4, C5, and C6 in the upstream, and C10 and C12 in the downstream. Other categories were excluded because they are not applicable to Moorim, or because the emissions are insignificant or not identified as significant due to the nature of the paper industry.

**Value Chain Emissions for Moorim 2023**




1) If internal transactions between companies exist, it is exclude from the Scope 3 calculation. 2) Ratio of EDP (Environmental Product Declaration) certified products to total production in 2023: Moorim Paper 2.6%, Moorim SP not applicable, Moorim P&P 70.4%.
※ Calculated Scope 3 emissions based on Moorim's own methodology

# Climate-Related Metrics

As Moorim's business sites are subject to the GHG emissions trading system, there is a possibility of exposure to risks due to changes in policies and regulations related to the domestic GHG emissions trading system. In particular, policies with strengthened regulation, such as the government's enhancement of the 2030 national greenhouse gas reduction target, may lead to an increase in the proportion of paid allocations, and in the mid to long term, there is a potential risk of increased costs due to increases in emission permit prices. Accordingly, the sales of Moorim P&P, which has the highest emissions within Moorim, have been identified as assets and business activities vulnerable to transition risks, and we have established a 2050 carbon neutrality roadmap to respond to regulatory risks.

| Assets or Business Activities | Sales in 2023 |
|---|---|
| Sales from Moorim P&P | KRW 719.2 billion |

## (3) Assets or Business Activities Vulnerable to Climate-Related Physical Risks

Moorim utilized S&P's Climanomics® analysis tool to assess the level of physical risks due to climate change at its major business sites. It was identified that Moorim Paper exhibits a relatively higher level of physical risk. Specifically, the impact of abnormal temperatures due to climate change is expected to be the greatest concern, and risks of flooding due to wildfires and heavy rain have also been identified. Consequently, it has been determined* that Moorim Paper has relatively high exposure to physical risks, identifying its revenue as being vulnerable to climate-related physical risks in its assets or business activities.

| Assets or Business Activities | Sales in 2023 |
|---|---|
| Sales from Moorim paper | KRW 514.3 billion |

* The physical risk analysis results are the outcomes of the modeling of extreme weather phenomenon and are not based on actual damage cases experienced by the business sites.

## (4) Assets or Business Activities Aligned with Climate-Related Opportunities

Moorim recognizes the changes in the domestic and international pulp and paper industry markets and the strengthened environmental regulations on plastic disposable products as opportunities. We also strive to promote the research and development of technology-intensive paper products and obtain certification for eco-friendly products. Moorim operates the only integrated research institute for pulp, paper, and advanced material in the country, expanding the scope of the paper industry through research and development. In 2022, Moorim restructured the organization, focusing on eco-friendly materials to enhance the efficiency of research and development. Moorim Research Center is advancing technological innovation and new technology development in pulp and paper through research and development and collaboration, in response to environmental changes and customer demands.

Sales of Environmentally Certified Products

| Category | Unit | 2021 | 2022 | 2023 |
|---|---|---|---|---|
| Moorim Paper | | | | |
| Total Sales Amount | million KRW | 424,425 | 500,913 | 480,595 |
| Sales Amount of Environmentally Certified Products | million KRW | 150,303 | 208,001 | 193,198 |
| Sales Ratio of Environmentally Certified Products | % | 35.4 | 41.5 | 40.2 |
| Moorim SP | | | | |
| Total Sales Amount | million KRW | 114,097 | 127,695 | 128,479 |
| Sales Amount of Environmentally Certified Products | million KRW | 53,460 | 61,219 | 69,262 |
| Sales Ratio of Environmentally Certified Products | % | 46.9 | 47.9 | 53.9 |
| Moorim P&P | | | | |
| Total sales amount | million KRW | 419,973 | 546,828 | 554,219 |
| Sales Amount of Environmentally Certified Products | million KRW | 300,061 | 371,551 | 467,978 |
| Sales Ratio of Environmentally Certified Products | % | 71.4 | 67.9 | 84.4 |

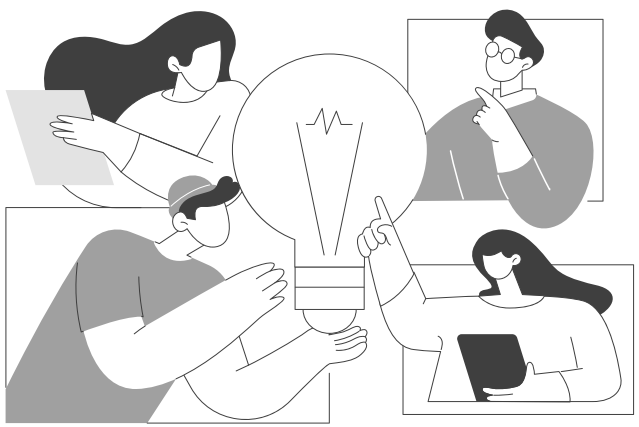
# Climate-Related Metrics

## (5) Capital Allocation

Please refer to the details of the impact on the financial statements for the current and next year within the financial position, financial performance, and cash flow regarding capital allocation in preparation for Moorim's climate-related risks or opportunities.

## (6) Compensation (Management)

Moorim determines the compensation for C-level management in each company through performance evaluations, which include activities related to carbon emissions. We strive to link the performance of greenhouse gas reduction target implementation with management compensation, aiming to improve profitability by securing more emission permits that can be sold through carbon emission reductions.



## (7) Industry-Based Metrics (Pulp & Paper Products)

| Topic | Code | Metric | Unit |
|---|---|---|---|
| **Greenhouse Gas Emissions** | RR-PP-110a 1 | Gross global Scope 1 emissions | $tCO_2e$ |
| | RR-PP-110a 2 | Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets | $tCO_2e$ |
| **Energy Management** | RR-PP-130a 1 | [1] Total energy consumed | GJ,% |
| | | [2] Percentage grid electricity | |
| | | [3] Percentage from biomass | |
| | | [4] Percentage from other renewable energy | |
| | | [5] Total self-generated energy | |

# Climate-Related Targets

## (1) Information on Indicators Used for Target Setting (Target Indicators, Purpose, Scope, etc.)

Moorim Paper and Moorim P&P recognize the climate crisis as a crisis facing humanity and have established a 2050 carbon neutrality roadmap to contribute to achieving the national carbon neutrality goals, including those of customers and stakeholders. Moorim Paper and Moorim P&P plan to reduce emissions by 25% by 2030 through process efficiency and self-generation, while Moorim P&P aims to reduce emissions by 45% through process efficiency improvements such as replacing eco-friendly high-efficiency recovery boilers and generators. In the mid to long term, we will continuously review and apply tasks such as procuring renewable energy (direct PPA), transitioning to low-carbon fuels, and operating carbon offset programs to achieve the 2050 carbon neutrality goal. Moorim will strive to disclose performance regarding the implementation of the carbon neutrality roadmap to manage climate change-related risks and create new opportunities.

Climate-Related Targets

(Unit: thousand $tCO_2$-eq)

| Target Indicator | Purpose | Scope | Target Type | Base Year | Interim Year | Final Year |
|---|---|---|---|---|---|---|
| | | | | 2022 | 2030 | 2050 |
| Total Scope 1 and 2 emissions | Climate mitigation | Moorim Paper, Moorim P&P | Absolute target | 445 | 334 (25% Reduction) | 0 (100% Reduction) |
| Expansion of Eco-friendly products | Securing market opportunities | Moorim Paper, Moorim SP, Moorim P&P | Qualitative target | Expansion in continuous product development and sales on of eco-friendly products | | |

## (2) Methods of Monitoring Progress towards Targets

### (A) Process of Reviewing Targets

Moorim analyzes changes in greenhouse gas emissions and energy consumption on a quarterly basis compared to the same period of the previous year and the previous quarter. Additionally, the sales performance of environmentally certified products is reported to the BOD. Furthermore, to achieve the carbon neutrality plan, we have reviewed the greenhouse gas emissions annually, and plan to review the carbon neutrality plan every five years (or immediately in case of significant changes).

Moorim has established and operates an organizational structure and dedicated organizations for each division to manage the impacts of climate change. Each dedicated organizations are responsible for activities aimed at achieving the goals set in the climate change response strategy. Through this, we review climate factors not only in response to laws and regulations and system but also when setting business directions and making large-scale facility investments. Since 2023, Moorim has been regularly reporting greenhouse gas emission performance by business site to the BOD. In particular, in 2024, the plan to establish and promote a climate change response strategy was reported to the BOD and received approval.

### (B) Monitoring Metrics towards Target Achievement Progress

Moorim monitors the following metrics related to the progress of achieving climate-related targets.

| Target Metrics | Progress Monitoring Metrics | Interim Target | Timing of Achievement | Final Target | Timing of Achievement |
|---|---|---|---|---|---|
| Scope 1, 2 emissions | Reduction ratio of total Scope 1 and 2 emissions | 25% | 2030 | 100% | 2050 |
| Percentage of sales of Eco-friendly certified products (%) | | Expansion in continuous product development and sales on of eco-friendly products | | | |

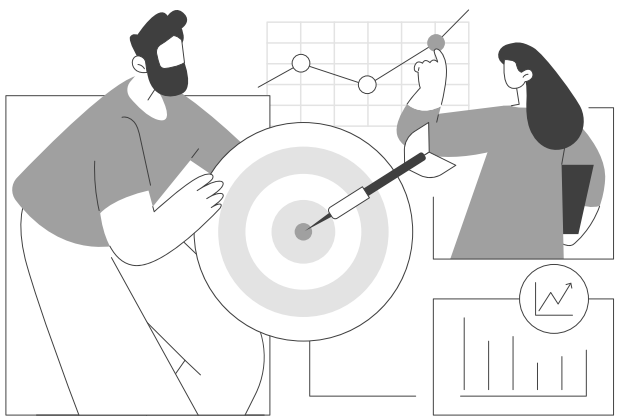
### (C) Revisions to Targets and Reasons

There are no revisions since the targets were established for the first time in the current year.

# Climate-Related Targets

## (3) Analysis of Performance against Targets

| Targets and Progress Monitoring Metrics | | 2022 Performance | 2023 Performance | Final Target | |
|---|---|---|---|---|---|
| | | | | 2030 Target | 2050 Target |
| Scope 1,2 (Region-based) | Emissions | 444,649 | 430,328 | 334,000 - | - |
| | Reduction Rate Compared to the Base Year | Base Year | 3.20% | 25% | 100% |
| Percentage of Sales of Eco-friendly Certified Products (%) | | 44% | 48% | Expansion in continuous product development and sales on of eco-friendly products | |



## (4) Information Related to Greenhouse Gas Emission Reduction Targets

### (A) Types, Scope, and Total Emissions of Greenhouse Gas Included in the Greenhouse Gas Emission Reduction Targets

Moorim has set reduction targets for Scope 1 and 2 emissions. Moorim's emission targets are for total greenhouse gas emissions, and targets have been established including three types of greenhouse gases ($CO_2$, $CH_4$, $N_2O$).

| Category | Type of Greenhouse Gas | | | | | |
|---|---|---|---|---|---|---|
| Scope | $CO_2$ | $CH_4$ | $N_2O$ | HFCs | PFCs | $SF_6$ |
| Scope 1 | O | O | O | X | X | X |
| Scope 2 | O | O | O | X | X | X |

*No greenhouse gas emission sources that emit HFCs, PFCs, and SF6.

### (B) Use of Sector Decarbonization Approach

When setting the carbon neutrality reduction targets, Moorim has applied the Absolute Contraction Approach instead of the Sector Decarbonization Approach.

# TCFD INDEX

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| | b. Describe management's role in assessing and managing climate-related risks and opportunities | 15 |
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| | c. Describe the resilience of the organization's strategy, taking into consideration different climaterelated scenarios, including a 2° C or lower scenario | 30~32 |
| Risk Management | a. Describe the organization's processes for identifying and assessing climate-related risks | 35~36 |
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