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# A. Kanadevia Group Business Activities

# A.1 Planetary Boundaries and Kanadevia Group Business Activities

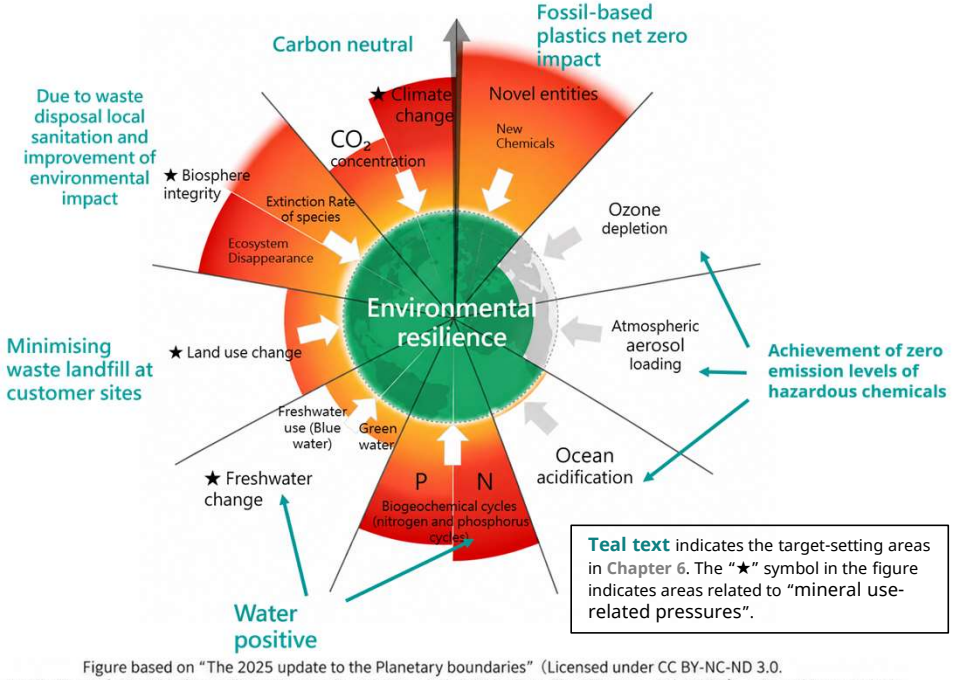



Figure based on "The 2025 update to the Planetary boundaries" (Licensed under CC BY-NC-ND 3.0.
Credit: "Azote for Stockholm Resilience Centre, based on analysis in Sakschewski and Caesar et al. 2025"), adapted by Kanadevia.

Figure A-1-1 Planetary Boundaries (2025) and Kanadevia Group's Activities

The Kanadevia Group aims to realise Resilience Eco Society®, a state in which environmental impacts in the regions where we conduct business remain within the environmental resilience represented by the Planetary Boundaries. Because limits on regional environmental impacts are established by governments through laws and regulations, the Group must conduct its business in compliance with applicable laws and regulations. Where no regulatory requirements exist, we propose that environmental standards to be considered in the relevant business activity be specified in requests for proposal (RFPs) so as not to impair the environmental resilience of the region.

The Group can also provide products and services that help solve environmental challenges and thereby encourage other parties to conduct business activities in ways that do not impair environmental resilience. Taking such proactive action can also be viewed as part of the Group's responsibility across its value chain.

For each Planetary Boundary below, we explain (i) the minimum compliance requirements for ensuring that our own activities do not impair environmental resilience and (ii) proactive initiatives intended to minimise impairment of environmental resilience by other parties.

**Climate Change**

For climate change, the threshold is to keep the increase in global average temperature to below 2°C above pre-industrial levels. Annex I Parties to the United Nations Framework Convention on Climate Change are subject to obligations including implementation of policies to reduce GHG emissions. The Paris Agreement, adopted at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change, provides for climate measures linked to market mechanisms, and many companies now calculate and seek to reduce GHG emissions based on a 1.5°C scenario.

Accordingly, achieving targets established in light of the 1.5°C scenario can be regarded as the minimum required to avoid impairing environmental resilience in the climate-change domain. The Kanadevia Group needs to achieve its targets of reducing GHG emissions by 50% from 2013 levels by 2030 and achieving Carbon Neutrality by 2050.

In relation to our businesses, as described in **Section 4.9**, further progress in fuel switching away from fossil fuels, replacement of fossil-fuel-based power generation with Waste to Energy, and replacement of landfill with Waste to Energy to suppress methane emissions from organic waste can make a major contribution to reducing GHG emissions. These initiatives can help other parties reduce dependence on non-renewable energy while expanding access to energy and reducing GHG emissions generated by others. The Group will therefore proactively make the types of business proposals described **in Section 4.8**.

Table A-1-1: Planetary boundaries limit points (Climate Change)

| Earth system process | Limit points |
|---|---|
| **Climate Change** | To limit the increase in global average temperature to less than 2°C above preindustrial levels; a 2°C increase is considered a threshold that could have a significant impact on the earth system. The planetary boundary for atmospheric $CO_2$ concentrations is set at 350 ppm.<br>The anthropogenic radiative forcing ($Wm^{-2}$) at the upper edge of the atmosphere is set at 1.0 $Wm^{-2}$ . |

**Biosphere Integrity (Biodiversity Loss)**

For biosphere integrity (biodiversity loss), the threshold is to keep the extinction rate below 10 extinctions per million species per year. We did not identify a commonly accepted international indicator equivalent to those used for climate change that should be incorporated directly into the Kanadevia Group's business activities.

However, in light of the Group's Sustainable Vision and The Four Sustainability Principles, which underpinned the Group's materiality assessment, the Group will rigorously implement environmental management so that it does not depend on natural resources that are poorly managed by others and so that its own business activities do not undermine ecosystem integrity.

The Group also requests suppliers to comply with the Kanadevia Group Basic Procurement Policy, proactively supports customers in conducting environmental assessments, and encourages practices that avoid undermining ecosystem integrity.

Table A-1-2: Planetary boundaries limit points (Biosphere Integrity)

| Earth system process | Limit points |
|---|---|
| **Biosphere Integrity (Biodiversity Loss)** | Maintain ecosystem diversity and prevent species extinctions. Defines the global boundary for changes in genetic diversity as the maximum extinction rate that is compatible with the conservation of the genetic basis of the biosphere's ecological complexity. Limit species extinction rates to less than 10 per million species per year.<br>It also defined the Earth's limit on changes in functional diversity as the rate of energy (net primary production) available to the ecosystem. More energy remains available to maintain the functioning of the ecosphere than 90% of pre-industrial times. |

**Stratospheric Ozone Depletion**

For stratospheric ozone depletion, the threshold is to keep stratospheric ozone loss to less than 5% below pre-industrial levels. The Vienna Convention for the Protection of the Ozone Layer (1985) and the Montreal Protocol on Substances that Deplete the Ozone Layer (1987) have been adopted, and Parties have enacted domestic legislation regulating the production, import, and export of ozone-depleting substances and controlling their emissions.

The Kanadevia Group does not manufacture or recover ozone-depleting substances such as CFCs and their alternatives, nor does it manufacture or recover products that use ozone-depleting substances. However, it does use products and equipment containing such substances. In accordance with laws and regulations in the countries and regions where it operates—including restrictions on the production, import, and export of ozone-depleting substances and measures to control emissions—the Group rigorously manages these substances. In its business activities, it also promotes a shift to products and equipment that do not use ozone-depleting substances.

Table A-1-3: Planetary boundaries limit points (Stratospheric Ozone Depletion)

| Earth system process | Limit points |
|---|---|
| **Stratospheric Ozone Depletion** | Protects the ozone layer and inhibits harmful ultraviolet radiation from reaching the Earth. Depletion of the ozone layer has adverse health effects, including skin cancer, cataracts and a weakened immune system. Limit stratospheric ozone depletion from pre-industrial levels (290 Dobson Units (DU)) to less than 5% (the boundary of the safe operating area is 276 DU); a 5% depletion is considered the threshold at which the ozone layer may be prevented from recovering. |

### Ocean Acidification

For ocean acidification, the threshold is to maintain the average aragonite saturation state of surface ocean waters at 80% or more of pre-industrial levels. In June 2023, the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction, which seeks to ensure the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (ABNJ) covering more than two-thirds of the ocean, was adopted. The agreement, which seeks to introduce internationally legally binding measures for the protection of the marine environment, respect for marine ecosystems, pollution prevention, and conservation of marine biodiversity values, entered into force in January 2026. In conjunction with the target under the Kunming-Montreal Global Biodiversity Framework to conserve at least 30% of terrestrial and marine areas, this is expected to lead to protection of approximately 30% of the high seas by 2030.

In light of the fact that the principal cause of ocean acidification is the increase in $CO_2$ concentration in seawater associated with rising atmospheric $CO_2$ concentrations, the Kanadevia Group will work to reduce GHG emissions. Following entry into force of the agreement, the Group will also monitor implementation in national and regional legislation and manage its activities in accordance with the treaty and applicable domestic laws.

Table A-1-4: Planetary boundaries limit points (Ocean Acidification)

| Earth system process | Limit points |
|---|---|
| **Ocean Acidification** | Reduce ocean acidification and protect marine ecosystems. Carbonate ion concentration in surface seawater (specifically, global average surface ocean aragonite saturation (2.75 Ω) relative to aragonite). A reduction in aragonite saturation can lead to the collapse of marine ecosystems. Maintain average aragonite saturation of the ocean surface waters at 80% or more of pre-industrial levels (3.44 Ω). |

### Biogeochemical Flows（Nitrogen and Phosphorus Cycles)

For biogeochemical flows of nitrogen and phosphorus, the thresholds are to limit human interference with global flows, relative to pre-industrial levels, to a global average of 62 million tonnes of nitrogen per year or less and 11 million tonnes of phosphorus per year or less, with a regional average threshold of 6.2 million tonnes of phosphorus per year or less. Regional distribution must also be considered. Strict legal water-quality standards are established in individual countries and regions. The Kanadevia Group therefore conducts its business in compliance with applicable water-quality laws and regulations. Where the Group conducts business in a country or region without legally prescribed water-quality standards, we propose that applicable water-quality requirements be specified in the RFP for the relevant business activity.

The Group also operates a Water Business. Through water treatment, it can help reduce excessive discharges of nitrogen and phosphorus contained in other parties' wastewater. Accordingly, in the Water Business, we will proactively propose solutions that help other parties reduce nitrogen and phosphorus discharges.

Table A-1-5: Planetary boundaries limit points (Biogeochemical Flows)

| Earth system process | Limit points |
|---|---|
| **Biogeochemical Flows (Nitrogen and Phosphorus Cycles)** | Excessive discharge of nitrogen and phosphorus is controlled to prevent water pollution and eutrophication. Excessive emissions can upset the ecological balance, leading to mass mortality of aquatic organisms and adverse effects on human health. Limit human activities' intervention in the global cycle of nitrogen to no more than 62 million tonnes per year for nitrogen, compared to pre-industrial levels. Phosphorus should be kept below 11 million tonnes per year. The regional level boundary is a flow of 6.2 million tonnes per year from fertilisers to eroding soils to avoid extensive eutrophication of freshwater ecosystems. |

### Land-system Change

For land-system change, the threshold is to maintain at least 75% of the Earth's forest area. Regulation of forests differs by country and region; in Japan, for example, the Forest Act has been enacted to protect forests and ensure their appropriate use, and strict regulations apply to forest development and utilisation. Where Kanadevia Group business activities involve forest development, the Group will obtain the development permits required by law and plan activities so that the scope and extent of development are kept to the minimum necessary. Depending on the location and scale of development, offset measures may also be required. We believe it is important to consider the need for offsets not only when the Group itself undertakes forest development, but also to propose such measures to customers when their business activities involve forest development.

Many Group businesses, particularly in the Infrastructure Business, use large areas of land. To minimise associated impacts, the Group will promote consolidation through higher-performance facilities. In the Waste to Energy Business, as described in **Section 4.8**, in regions and societies at an early stage of maturity in addressing waste issues, simply introducing waste-incineration facilities can reduce the volume of waste sent to landfill to 3% of the amount generated. Because global waste generation is expected to be enormous in 2050, the Group believes that actively making the business proposals described in **Section 4.9** can reduce waste generated by others and minimise pressures associated with land use.

Table A-1-6: Planetary boundaries limit points (Land-system Change)

| Earth system process | Limit points |
|---|---|
| **Land-system Change** | Decreasing forest area can cause a range of problems, including accelerated climate change, loss of biodiversity and soil erosion. Maintain at least 75% of the global forest area. In terms of residual forest cover compared to the potential area of Holocene forests, the boundary is 85%/50%/85% for boreal/temperate/tropical forests, respectively. |

### Freshwater Change

For freshwater use, the threshold is to keep annual global freshwater use by human activities to 4,000 km³ or less. Countries and regions establish legal standards relating to water cycles and water quality. In Japan, for example, relevant laws include the Basic Act on the Water Cycle, which aims to maintain a sound water cycle, laws and ordinances governing appropriate groundwater use and conservation, and the Water Pollution Prevention Act, which regulates effluent to protect water quality. The Kanadevia Group must comply with applicable laws and regulations when using freshwater in its business activities.

As described in **Section 4.9**, when the Group operates Waste to Energy facilities, water used in treatment processes is recirculated. Because the volume of water circulated can be many times the volume abstracted, this can be viewed as an initiative that reduces freshwater abstraction that would otherwise be required. In addition, the Group's Water Business can appropriately manage the quality of wastewater discharged by others, while water-production businesses can increase the number of people with access to clean water. We will therefore proactively propose solutions in these businesses as well.

Table A-1-7: Planetary boundaries limit points (Freshwater Change)

| Earth system process | Limit points |
|---|---|
| **Freshwater Change** | Excessive use can cause a range of problems, including water scarcity, ecosystem destruction and conflict.<br>Blue water: limit the upper limit (95th percentile) of the world's land area with deviations from pre-industrial variations for anthropogenic disturbances of blue water flows to no more than 10.2%.<br>Green water: for anthropogenic disturbances of water available to plants, limit the percentage of land area with deviations from pre-industrial changes to no more than 11.1 per cent. |

### Atmospheric Aerosol Loading

For atmospheric aerosol loading, the threshold is to minimise human-induced changes in atmospheric aerosol loading at the global scale relative to pre-industrial levels. Countries and regions have established strict standards regulating atmospheric aerosol loading; in Japan, for example, the Air Pollution Control Act applies, and the Kanadevia Group conducts its business in compliance with such laws and regulations. Some aerosols are also subject to regulation under the Montreal Protocol on Substances that Deplete the Ozone Layer (1987), and the impacts of aerosols on climate change are under discussion. If treatment of aerosols is clarified under these treaties and relevant laws and regulations are enacted in individual countries and regions, the Group will manage them accordingly.

The Group also works to control dust emissions from waste-incineration facilities in its businesses. As shown in **Table 6-1**, facilities operated under contract by the Group appropriately manage particulate emissions at levels below regulatory limits or using internal control values that are approximately ten times more stringent than the regulatory limits.

Table A-1-8: Planetary boundaries limit points (Atmospheric Aerosol Loading)

| Earth system process | Limit points |
|---|---|
| **Atmospheric Aerosol Loading** | Aerosols can have a variety of impacts, including respiratory diseases, climate change and changes in precipitation patterns. To limit the annual average of inter-hemispheric differences in aerosol engineering thickness (AOD) to 0.1. |

### Novel Entities (Chemical Pollution)

For pollution from novel entities, the boundary is exceeded when untested synthetic substances are released into the Earth system. Because the Kanadevia Group does not develop or manufacture new chemical substances, this does not ordinarily constitute a direct issue for the Group except in special cases where joint research partners or other parties develop, manufacture, or use untested synthetic substances and the Group is involved.

For pollution from existing chemicals, however, as discussed under stratospheric ozone depletion, atmospheric aerosol loading, ocean acidification, and other domains, countries and regions have established stringent regulations governing the handling, use, and release of chemicals according to the nature of the environmental impact and the properties of the chemical. The Group therefore conducts its business in compliance with applicable laws and regulations concerning pollution from existing chemical substances.

Table A-1-9: Planetary boundaries limit points (Novel Entities)

| Earth system process | Limit points |
|---|---|
| **Novel entities**<br>**(Pollution by chemicals)** | Limited to truly new anthropogenic introductions into the earth system. These include synthetic chemicals and substances (e.g. microplastics, endocrine disruptors, organic pollutants), artificially transferred radioactive materials such as nuclear waste and nuclear weapons, human-induced evolutionary modifications, genetically modified organisms and other direct interventions into evolutionary processes. The percentage of untested synthetic material released into the earth system is 0%. |

# A.2 Business Overview

## A.2.1 Environment Business Field

**Waste to Energy**

Waste to Energy facilities burn waste and treat it hygienically while at the same time generating electricity as an important energy resource. They consist of platforms, refuse bunkers, boilers and other equipment mainly made of steel, as well as cranes, generators, concrete building foundations and chimneys. Refuse collected in refuse pits by refuse collection vehicles is burnt and discharged as ash as it travels over a combustion device called a stoker in the incinerator. The heat energy generated by combustion is recovered as steam in the boiler and used to generate electricity in a steam-turbine generator. The electricity generated is also sent outside the facility.



Figure A-2-1-1: Waste to Energy plant

**Woody Biomass Power Generation System**

A wood biomass power generation system is a renewable-energy power generation method that uses wood resources as fuel to generate electricity. At the Kanadevia Group's Miyanosato Power Plant, waste wood, thinned wood and forest residues from nearby forests are used as fuel. The fuel is dried and stored, then burnt or gasified in a boiler to generate steam or gas, which is then used to turn a turbine or engine to generate electricity.



Figure A-2-1-2: Configuration Diagram of a Wood Biomass Power Generation Facility

**Methane Fermentation System**

Methane fermentation systems enable organic waste such as food waste, prunings, paper and night-soil sludge to be converted into biogas by methane fermentation, which can then be used as renewable energy. Organic waste and other raw materials are fed into a fermentation tank, where they are decomposed by microorganisms in an oxygen-free environment. The biogas generated by fermentation is recovered and used for power generation or heat supply. Depending on the type of waste, two methane fermentation treatment systems, wet and dry, are available.



Figure A-2-1-3: Biogas plant

**Biological Methanation**

Biological methanation is a technology whereby carbon dioxide contained in flue gas emitted from power stations and factories, digester gas from sewage treatment, and biogas derived from food waste, agricultural waste, etc. is reacted with hydrogen by microorganisms to produce methane. Impurities in the biogas, such as hydrogen sulfide and ammonia, have limited adverse effects and can provide nutrients for the microorganisms. Methane is the main component of natural gas, and as existing gas supply networks can be used, expectations are high for this as a next-generation energy source. (For catalytic methanation, see “Methanation,” p. 197.)



Figure A-2-1-4: Biological methanation at Limeco

**Seawater Desalination Plant**

Desalination plants remove salt and impurities from seawater to produce fresh water that can be used for drinking and domestic purposes. They are particularly important in areas where the water cycle does not function well and fresh water is chronically scarce, such as in the Middle East and on remote islands. One of the typical technologies used in these plants is reverse osmosis (RO). This technology obtains fresh water by passing seawater under pressure exceeding the osmotic pressure through a semipermeable membrane. It is characterised by its high energy efficiency.



Figure A-2-1-5: RO Seawater Desalination Plant

**Sludge Recycling and Resource Recovery / Landfill Leachate Treatment Systems**

Sludge recycling and resource-recovery systems recover and reuse resources such as phosphorus and energy while treating organic waste such as night soil and septic-tank sludge in a hygienic manner. Landfill leachate treatment systems use advanced technology to remove hazardous substances from leachate generated from landfill sites and purify it to safe water-quality levels. These systems contribute to the creation of a circular economy by enabling the hygienic treatment of organic waste and the effective use of resources.



Figure A-2-1-6: High-load Nitrogen-removal IZ System*

* IZ system: a high-rate aeration system developed by Ingenieurtechnisches Zentralbüro in Wehlen, former East Germany.

**Water, Sewage and Industrial Wastewater Treatment Systems**

Water, wastewater and industrial wastewater treatment systems are comprehensive water treatment technologies, which cover the entire process from the stable supply of water for domestic use to the purification and reuse of wastewater. In water purification treatment, safe, clean drinking water is supplied through processes such as coagulation, sedimentation, filtration and activated carbon adsorption. In sewage treatment, advanced treatment technologies such as membrane separation and ozone treatment are used to purify water to meet environmental standards. In industrial wastewater treatment, customised technologies tailored to the wastewater characteristics of each industry enable the removal of harmful substances and the reuse of water, contributing to the reduction of environmental impact and the recycling of resources.

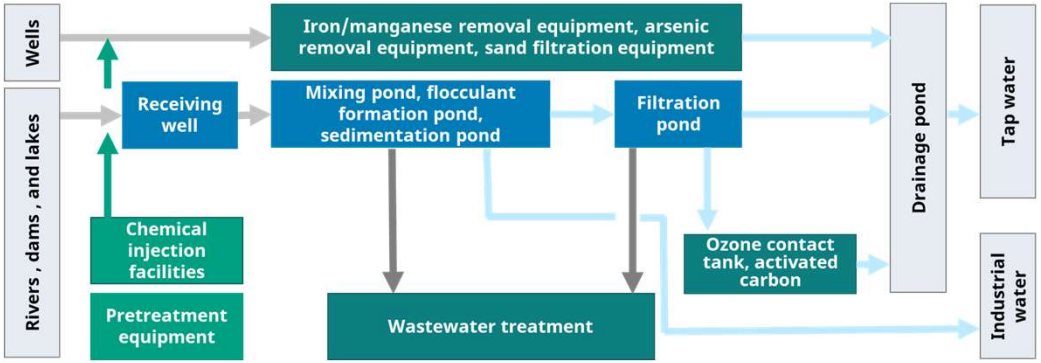



Figure A-2-1-7: Drinking-water and Industrial-water Treatment System Flow

## A.2.2 Machinery Business Field

**Deposition System for Anti-reflection and Anti-fingerprint**

By combining a sputtered cathode designed by Kanadevia Group and the vacuum deposition method we cultivated during the development of organic EL film deposition equipment, we provide equipment that achieves integrated film formation in the same equipment from the antireflection layer to the antifouling layer, thus maximising production efficiency. This equipment achieves high antifouling performance, durability and sliding properties on the topmost surface of displays with touch panels, while the high productivity of the roll-to-roll process enables both performance and efficiency, which have been difficult to achieve with conventional wet coating methods.

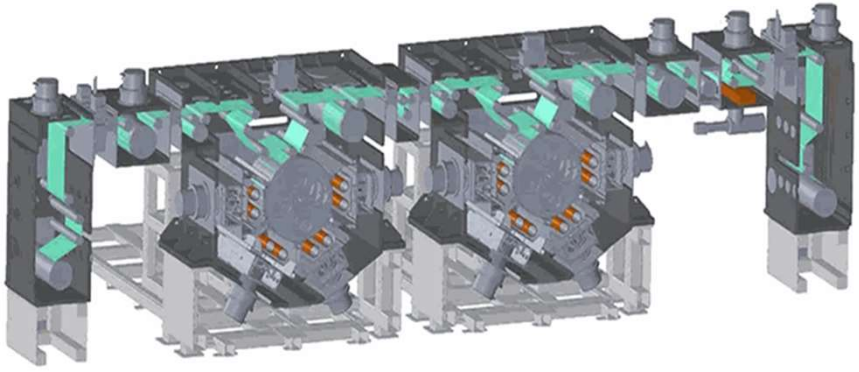


Figure A-2-2-1: Equipment for Continuous Deposition of AR and AFR Coatings on Flexible Substrates

**Filter Press**

A filter press is a solid-liquid separation device featuring filtration, washing and dewatering functions. It enables the separation of fine particles and precision filtration through the cake layer. Kanadevia Group's products achieve low moisture content through high-pressure pressing of up to 2.0 MPa, in addition to standard pressing at 0.7 MPa. A washing method using feed ports also enables extraction of useful components and cake purification. The system is used in many sectors, including chemicals and wastewater treatment, and offers a wide range of products and technical support according to application and treatment volume.



Figure A-2-2-2: Filter Press

## A.2.3 Infrastructure Business Field

### Hydraulic Gate

Kanadevia has a history of more than 100 years as a manufacturer of hydraulic gates and penstocks. We have delivered numerous gates installed at dams and rivers, including high-pressure gates for dams and large river gates, as well as penstocks and steel pipes. Based on our safe and reliable construction of hydraulic gate facilities, we continue to develop new technologies such as large Flap Gates for tsunami and disaster prevention, efficient management methods for existing equipment, and functional upgrades through renewal and redevelopment of existing dams and penstocks. Through these developments, Kanadevia aims to contribute to more advanced facilities and safe, sustainable national and regional infrastructure.



Figure A-2-3-1: Nagashima Hydraulic Gate (Tilting Roller Gate)

### Flap-gate Flood Disaster Mitigation System

Recent years have seen increasingly serious damage from tsunamis generated by major earthquakes or flooding caused by torrential rain, making disaster-proofing our communities an urgent issue. Kanadevia's Flap-Gate Type Seawall against flood disaster uses the power of nature itself, in the form of tsunamis or storm surges, to the maximum, preventing flooding damage. Given the rarity of these phenomena, the system has been designed to extremely high standards of reliability to ensure the requisite level of protection when called upon.



Figure A-2-3-2: Land-installed Flap Gate-type Movable Seawall

## A.2.4 Carbon Neutral Solution Business Field

**DeNOx Systems, DeNOx Catalysts, and Decarbonisation-related Catalysts**

Kanadevia Group is working on the development of catalyst technologies for denitrification equipment to remove NOx from exhaust gases, as well as for fuels such as LNG and ammonia in support of decarbonisation. The Group seeks to reduce GHG emissions through methane oxidation catalysts, $N_2O$ decomposition catalysts and ammonia-cracker catalysts. We are also working on innovative technologies to synthesise LPG directly from $CO_2$ and hydrogen, and through these advanced technologies we contribute to decarbonisation of the industrial and marine sectors and the creation of a sustainable energy society.

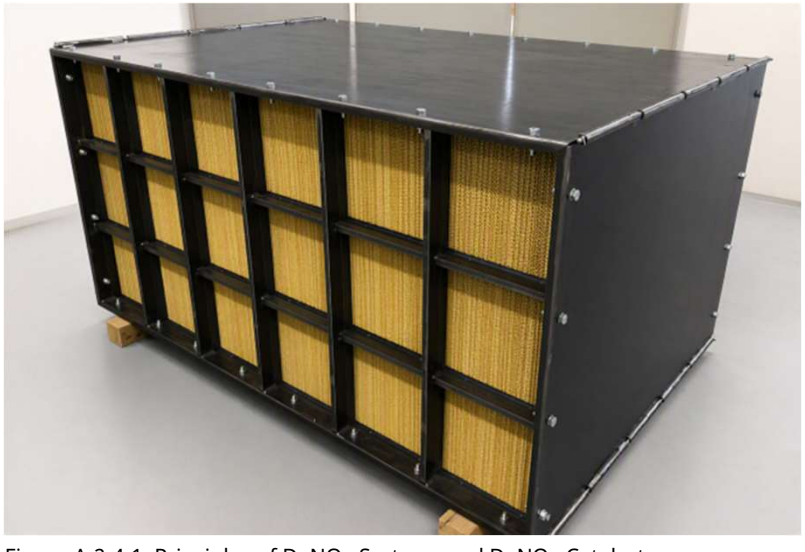


Figure A-2-4-1: Principles of DeNOx Systems and DeNOx Catalysts

**Process Equipment (Pressure Vessels)**

Kanadevia Group supplies pressure vessels and heat exchangers to the petroleum refining and petrochemical industry, fertiliser plants, and industrial plants such as seawater desalination plants and pulp plants. We manufacture desulfurisation reactors made from chrome-molybdenum steel, our main product, along with CCR reactors, FCC reactors, ammonia converters, and other items. The Group is one of the few manufacturers to have established reactor-production technology. We are proud of our prominent welding techniques and process technologies, which enable us to deliver high-quality reactors.



Figure A-2-4-2: Pressure Vessel (Hydrodesulfurisation Reactor for Bahrain)

**Nuclear Fuel Cycle-related Equipment**

Kanadevia Group manufactures transport casks and storage casks for spent nuclear fuel generated by nuclear power plants, auxiliary equipment such as heat exchangers for nuclear power plants, and various containers and equipment used in reprocessing plants. We possess particularly advanced technical capabilities in the design and manufacture of metal and concrete casks, boasting a substantial track record of deliveries to countries worldwide. Furthermore, we develop and provide technologies that enhance safety, such as neutron shielding materials and shock-absorbing buffers.



Figure A-2-4-3: Cask

**Boiler**

A boiler is equipment that utilises various energy sources and converts them into steam or other forms of energy. It works by transferring the heat generated by burning fuel in a combustion chamber to water through heat-transfer tubes to generate steam. Exhaust heat is recovered and reused, resulting in highly efficient operation and helping to reduce environmental impact. High-quality welding technology enables even large boilers to be shipped complete, supporting efficient installation work and reliable operation. In addition, a post-delivery inspection and maintenance system is in place to support long-term, stable operation.



Figure A-2-4-4: Boiler

**Methanation Technology**

Methanation systems produce synthetic methane from carbon dioxide and hydrogen. Carbon dioxide recovered from exhaust gases from industrial facilities and hydrogen produced using electricity from renewable energy are used as feed gases to produce e-methane. By making effective use of this e-methane, the technology contributes to reducing $CO_2$ emissions and realising a carbon recycling[93)] society.



Figure A-2-4-5: Carbon Circulation through Methanation

**Wind Power Generation**

The Wind Power Generation Business promotes comprehensive project development based on regional characteristics and environmental conditions. For the installation of wind power, the Kanadevia Group promotes wind-farm-specific project development by investigating and analysing various factors such as wind conditions, grid connectivity, access roads, landowner cooperation and environmental impact.

For onshore Wind Power, the Group has established an integrated system that handles everything from site selection to construction, operation and maintenance, enabling sustainable business operations that are rooted in the local community. Through several large-scale projects to date, the Group has accumulated technical capabilities and operational know-how.

For offshore Wind Power, the Group has design, fabrication and installation technologies for various types of foundation structures and can propose foundation structures suited to the respective sea areas.



Figure A-2-4-6: Matsugasaki Wind Power Plant (Onshore Wind)

# B. Comparison with SSBJ Requirements

# B. Comparison with SSBJ Requirements

The climate-related metrics in this disclosure are prepared with reference to the approach of the Sustainability Standards Board of Japan (SSBJ), taking into account the characteristics of the Kanadevia Group's businesses, the current status of data development, and existing disclosure practices.

This appendix sets out the positioning of the metrics, their scope, and the approach to calculation to help readers understand their meaning and underlying assumptions. It is not intended to disclose detailed information for recalculation, such as individual formulas or coefficients.

This disclosure does not cover every metric defined in the SSBJ Standards. Instead, from the perspectives of business characteristics and materiality, it focuses on metrics considered useful to investors' decision-making. It also takes into account consistency with TCFD and TNFD and addresses areas of high relevance.

**1. Positioning of SSBJ Metrics**

Taking into account the approach of the SSBJ Standards, we focus on metrics considered material for appropriately explaining the effects of climate change on our businesses and medium- to long-term corporate value.

This disclosure does not assume full compliance with the SSBJ Standards; it is positioned as an approach reflecting current practice and the present state of data development.

**2. Scope of Metrics Covered**

This disclosure focuses on metrics closely related to climate change and considered to have significant implications for corporate value, including GHG emissions and energy use.

These metrics are selected from the perspectives of materiality and explainability, taking into account the characteristics of the Kanadevia Group's businesses and the structure of its value chain.

This disclosure does not cover all relevant data; it focuses on the range considered useful for investors in comparing companies and making decisions.

**3. Definitions and Scope of Metrics (Scope / Boundary)**

For each metric, the Kanadevia Group defines the item being measured and establishes the organisational and business-activity boundaries included in the calculation.

As a general rule, the scope is based on business activities within the Group's consolidation perimeter. However, certain sites or activities may be excluded where data are difficult to obtain and the impact is judged to be immaterial.

GHG emissions are classified with reference to internationally recognised standards such as the GHG Protocol and based on whether the Group substantively controls the relevant activities.

In setting boundaries, the Group seeks to balance comparability with practical reasonableness.

**4. Approach to Calculation Methods**

Metrics are calculated with reference to the approaches in internationally recognised standards and guidelines such as the GHG Protocol, while maintaining consistency over time.

This appendix sets out only the basic approach and assumptions for calculation and does not disclose individual formulas, coefficients, or detailed calculation procedures.

This reflects our view that, for investor comparisons, consistency in metric definitions and scope is more important than the detailed calculation process itself.

**5. Assumptions, Estimates, and Calculation Limitations**

The metrics in this disclosure are calculated under certain assumptions. Some metrics may include estimates based on reasonable methods because of constraints on data availability. There are also certain limitations arising from the scope of reporting and the coverage of data collection.

Because these assumptions and limitations are important factors that can affect interpretation of the metrics, we emphasise clearly disclosing their existence to support appropriate understanding.

**6. Location of Data (ESG Databook)**

Detailed primary information, including metric values, breakdowns, and year-on-year trends, is provided in the ESG Databook.

This appendix sets out the underlying approach and assumptions; readers seeking detailed data should refer to the ESG Databook.

By separating the roles of the main report and the ESG Databook, we seek to maintain readability while enabling easy access to the information readers need.

**7. Disclosure Approach (Disclosure Stance and Phased Response)**

We believe it is important to present not only the metric values themselves, but also the assumptions and background underlying them.

In this disclosure, we emphasise clearly stating the scope, assumptions, and calculation limitations so that readers can appropriately understand the meaning and interpretation of the metrics.

Detailed formulas and coefficients are not disclosed because we do not consider them essential for investor comparison and understanding. This approach reflects a balance between comparability and ease of understanding.

This approach is an initial response in the transition to the SSBJ Standards and will be reviewed continuously in light of future regulatory developments and progress in data development.

**8. Summary of Key Assumptions**

The principal assumptions in this disclosure are as follows:

- Scope: In principle, based on the Company’s consolidation perimeter
- Time horizon: Primarily annual actual results
- Estimates: Some metrics include estimated values
- Limitations: Certain constraints exist regarding data coverage and calculation conditions

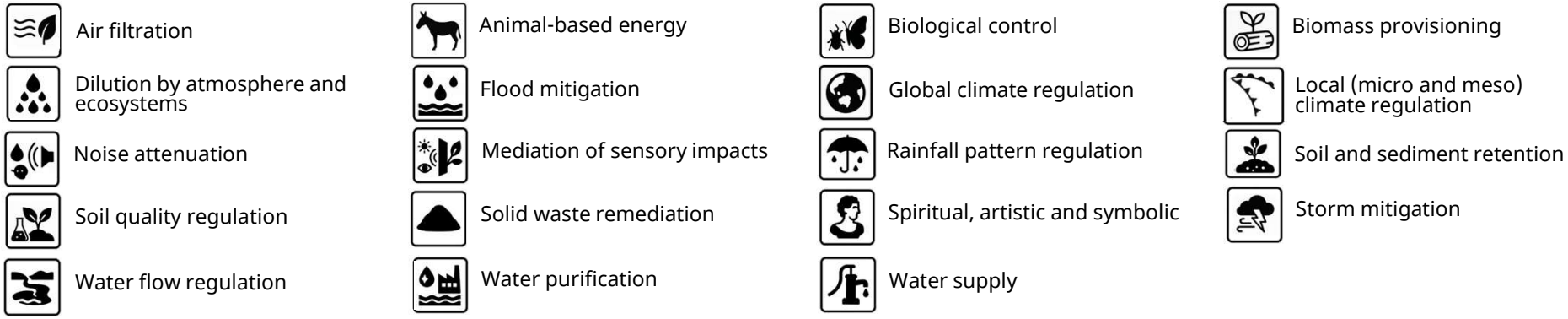
Because these assumptions may affect comparison and interpretation of the metrics, they should be taken into account in peer comparisons and time-series analysis.

# C. Analysis of Dependencies, Impacts, Risks and Opportunities by Business Field

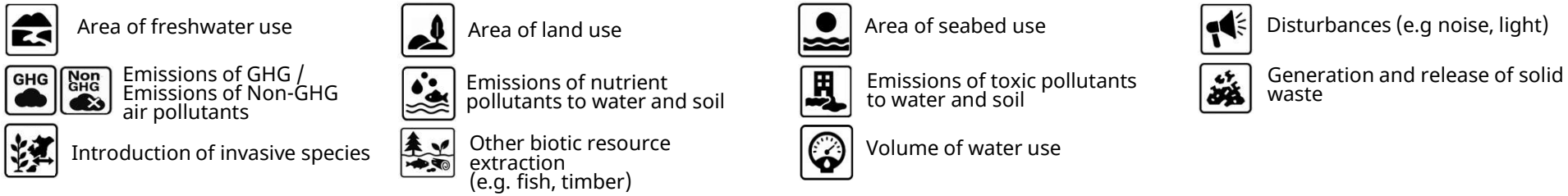
# C.1 Assessment of Dependencies and Impacts on Nature (Analysis Using ENCORE)

ENCORE was used for sector-level screening. Assessments were changed only where evidence was available concerning location, operating volumes, actual emissions, permits, accident history, and the effectiveness of mitigation measures; the ratings shown reflect residual risk.

**[Dependence on natural capital legend of icons]**




**[Impact on natural capital legend of icons]**




**Assessment Results for Nature-related Dependencies and Impacts in the Kanadevia Group's Businesses**

The following section explains the characteristics of the assessment results, focusing on items rated Very High or High by ENCORE. It also explains the reasons for items where the ENCORE rating was lowered from Very High or High. For Waste to Energy, the section additionally presents analysis of Malakoff Corporation Berhad's Malacca project as a peer case.

**[Environment Business]**

**Waste to Energy / Dependencies (Heat Map)**

[Key Characteristics]

In the procurement process, the cultural ecosystem service “spiritual, artistic and symbolic” is rated Very High for cement manufacturing by suppliers, reflecting that mountains from which limestone is quarried are often regarded as symbols of local communities. Actual assessments vary by quarry location, but we conservatively retained the ENCORE rating. Steel manufacturing by suppliers also depends on the provisioning service “water supply” and the regulating service “water-flow regulation” because of the importance of water in steel production; both are rated High.

In the construction and site-adjustment process, dependence on the regulating services “global climate regulation” and “local climate regulation” is rated High because construction schedules are weather-dependent.

For construction-stage disposal and infrastructure disposal, dependence on the regulating service “solid waste remediation” associated with landfill disposal is rated High for each item.

[Changes from the ENCORE Assessment]

In the construction and site-adjustment process, “rainfall-pattern regulation” is rated Very High by ENCORE, but we lowered the rating to Medium because construction schedules are established taking expected rainfall into account.

In the operating process, the provisioning service “water supply” and the regulating service “water-flow regulation” are rated High by ENCORE, but we lowered them to Low. This reflects our assessment that dependency on natural capital is low because project owners select sites with low water-related risk in RFPs and other procurement documents issued after environmental assessments and because water used in the operating process is recirculated.

[Customer Example]

The assessment for Malakoff Corporation Berhad’s Malacca project is consistent with Kanadevia’s assessment for many items, but differs for the following items.

For “solid waste remediation” in the construction-stage disposal and disposal processes, the local state of waste-disposal management was not known. The ENCORE rating of Very High was therefore conservatively adopted, resulting in a higher level of dependency than Kanadevia’s High rating.

**[Environment Business field]**

**WtE / Dependences (Heat Map)**

[Features]

Overall, the level of risk is relatively high at all stages of the process. In particular, in the "Operation" process, the impact of "GHG emissions" is rated Very High because of the large amount of "GHG emissions" from plastics contained in waste. In the "Construction and on-site coordination," "Disposal during construction," "Operation," and "Infrastructure disposal" processes, depending on the location of the facility, changes in the use of terrestrial, freshwater, and marine areas may occur, resulting in risks of impacts on natural capital and ecosystems. These are therefore rated Very High or High. "Direct water abstraction," "Non-GHG emissions," "Water and soil pollution," "Water and soil eutrophication," "Solid waste emissions," and "Noise/light pollution" are conservatively rated High for several processes because the status of treatment in countries outside Japan has not been sufficiently identified.

[Changes made to ENCORE's evaluation]

For the "Operation" process, the following changes have been made to "Pollution to air (non-GHG air pollutants)" and "Emissions of pollutants to water and soil." "Pollution to air (non-GHG air pollutants)" is rated Very High in ENCORE, but has been lowered to Low for the following reasons. The client conducts an environmental assessment and, based on this assessment, establishes regulatory limits for operational management. As long as these limits are complied with, the impact on the environment is limited. In addition, the system is designed to make an emergency stop in the event of a disaster during operation. In other words, if an abnormality is detected through monitoring or analysis, the system can be shut down by activating the emergency stop button. After the shutdown, waste is no longer burned and no further gas is generated. Any gas remaining in the waste incineration power generation facility is discharged after being purified through a bag filter.

Furthermore, Kanadevia Group has set its own strict standards for substances harmful to humans (living organisms), which are generally less than one tenth of the legal limits, and has established a control manual to ensure thorough management. The values are monitored or regular sampling and analysis, and if the standard values are exceeded, measures are taken to reduce them (dilution, chemical input, reduction of raw material input itself), considering the cause, so that the substances are discharged below the regulation values when discharged off-site. If the impact cannot be reduced to the required level, the equipment is stopped. The environmental impact is therefore assumed to be lower and the level is reduced to Low. For "Emissions of toxic pollutants to water and soil", the level is lowered to Medium as it is assessed as having no impact, as environmental management is in place at all facilities and the project itself would cease operations if a problem were to occur.

[Customer Example]

The assessment for Malakoff Corporation Berhad's Malacca project is consistent with Kanadevia's assessment for many items, but differs for the following items.

In the procurement process, for "release of pollutants to water and soil," the status of chemical management by local suppliers is not known. We therefore conservatively adopted ENCORE's Very High rating, resulting in a higher impact rating than Kanadevia's Medium rating.

In the construction and local-procurement and construction-stage disposal processes, for "disturbance (noise/pollution, etc.)," future construction activities are involved and the management practices of local contractors and construction-waste operators are not yet known. We therefore conservatively adopted ENCORE's Very High rating, resulting in a higher impact rating than Kanadevia's High rating.

Table C-1-1: Waste to Energy — Dependencies on Natural Capital

| Process | Classification | Provisioning services | Regulating and maintenance services | | | | | | | | | | | | | | Cultural services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Procurement | Manufacture of special-purpose machinery | M | VL | VL | VL | VL | L | L | M | M | M | M | VL | - | L | VL | - |
| | Manufacture of basic iron and steel | H | VL | M | VL | VL | L | L | M | H | - | M | VL | - | - | VL | - |
| | Manufacture of non-metallic mineral products n.e.c.(>manufacture of articles of concrete, cement and plaster) | M | VL | L | L | VL | L | M | M | M | M | M | VL | - | L | VL | VH |
| Design and manufacture | Manufacture of special-purpose machinery | M | VL | VL | VL | VL | VL | L | VL | M | M | M | VL | - | L | VL | - |
| Construction and site coordination | Other construction installation | M | H | M | H | VL | M | VL | M | M | M | M | VL | - | VL | VL | - |
| Disposal during construction | Other construction installation | M | VL | M | L | VL | M | VL | M | M | M | M | VL | - | VL | VL | - |
| | Waste treatment and disposal | M | VL | M | - | VL | VL | H | M | M | VL | L | VL | VL | M | VL | - |
| Operation | Fossil fuel energy production | L | VL | - | VL | VL | L | VL | - | L | M | L | VL | - | - | - | - |
| Infrastructure disposal | Demolition | L | M | VH | L | VL | M | - | M | L | L | L | VL | - | L | VL | - |
| | Waste treatment and disposal | M | VL | M | - | VL | VL | H | M | M | VL | L | VL | VL | M | VL | - |

*See p.202 for the legend of icons.

Table C-1-2: Waste to Energy — Impacts on Natural Capital

| Process | Classification | Area utilised | | | Direct extraction | Climate change | Pollution | | | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |  |
| Procurement | Manufacture of special-purpose machinery | L | - | - | M | L | L | M | - | L | M | - |
| | Manufacture of basic iron and steel | L | - | - | M | H | H | M | - | M | M | - |
| | Manufacture of non-metallic mineral products n.e.c.(>manufacture of articles of concrete, cement and plaster) | L | M | - | M | H | H | M | M | M | M | - |
| Design and manufacture | Manufacture of special-purpose machinery | L | - | - | M | H | L | M | - | L | M | - |
| Construction and site coordination | Other construction installation | VH | H | VH | H | H | L | H | - | M | H | L |
| Disposal during construction | Other construction installation | VH | H | VH | H | H | L | H | - | M | H | L |
| | Waste treatment and disposal | M | - | - | M | H | M | H | H | M | H | M |
| Operation | Fossil fuel energy production | M | H | - | L | VH | L | M | - | H | H | - |
| Infrastructure disposal | Demolition | VH | H | VH | H | H | H | H | - | M | H | L |
| | Waste treatment and disposal | M | - | - | M | H | M | H | H | M | M | M |

*See p.202 for the legend of icons.

**Biogas Power Generation / Dependencies (Heat Map)**

[Key Characteristics]

Because the equipment used in biogas power generation is similar to that used in other businesses, we assessed only the operating stage. No items were rated Very High or High.

[Changes from the ENCORE Assessment]

ENCORE rates “solid waste remediation” as Very High; however, because waste is treated industrially and the natural purification function is not used, we determined that there is no dependency.

Table C-1-3: Biogas Power Generation — Dependencies on Natural Capital

| Process | Classification | Provisioning services | Regulating and maintenance services | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Operation | Waste treatment and disposal | M | VL | M | VL | VL | M | M | VL | L | VL | VL | M | VL |

**Biogas Power Generation / Impacts (Heat Map)**

[Key Characteristics]

Because the methane produced is a GHG and there is a possibility of leakage, including through accidents, “GHG emissions” are rated High. In addition, because treatment methods for pollutant discharges after treatment at facilities outside Japan have not been confirmed, “water and soil pollution” and “water and soil eutrophication” retain ENCORE’s High rating.

[Changes from the ENCORE Assessment]

For “noise/light pollution,” the rating was lowered from High to Medium because environmental management is implemented at the facilities.

Table C-1-4: Biogas Power Generation — Impacts on Natural Capital

| Process | Classification | Area utilised | Area utilised | Climate change | Pollution | | | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |
| Operation | Waste treatment and disposal | M | M | H | M | H | H | M | M | M |

*See p.202 for the legend of icons.

**Biomass Power Generation / Dependencies (Heat Map)**

For biomass power generation, we analysed the Miyanosato Biomass Power Plant.

[Key Characteristics]

Because biomass power-generation equipment is similar to that used in other businesses, we assessed only procurement of feedstock such as wood chips and the operating stage. No items were rated Very High or High.

[Changes from the ENCORE Assessment]

According to ENCORE, because a biomass power plant depends on feedstock such as wood chips, the risk associated with the ecosystem service “biomass provisioning” in the “logging” sector within the procurement process would ordinarily be rated Very High. This reflects dependency on feedstock chips produced from logs—including so-called unused wood—harvested systematically under forest-management plans for use as biomass fuel. The Miyanosato Biomass Power Plant purchases approximately 63,000 tonnes of wood chips per year (at 40% moisture content) from the adjacent chip plant operated by the Miyanosato Biomass Limited Liability Business Partnership. That chip plant sources logs from approximately 27 forestry operators, mainly in Ibaraki Prefecture. “Unused wood” eligible for biomass power generation is limited to thinned wood and logs harvested in accordance with forest plans and other requirements under the Forest Act, where the land remains forested after harvesting through replanting or other means. The Miyanosato Biomass Limited Liability Business Partnership, which supplies wood chips to the Miyanosato Biomass Power Plant, is certified by the Japan Wood Chip Manufacturers Association as an accredited business operator for verification of woody biomass supplied for power generation and uses only wood chips based on forest thinning. We therefore lowered the risk associated with “biomass provisioning” to Medium. For the same reasons, ratings for “soil and sediment retention,” “air filtration,” “biological control,” and “soil-quality regulation” were lowered from Very High or High to Low.

Table C-1-5: Biomass Power Generation — Dependencies on Natural Capital

| Process | Classification | Provisioning services | | | Regulating and maintenance services | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Procurement | Sawmilling and planing of wood | M | L | - | VL | VL | L | M | - | L | M | - | L | L | L | VL | VL | L | - |
| | Logging | M | M | M | - | - | - | L | L | L | M | - | M | VL | L | VL | L | - | VL |
| Operation | Biomass energy production | M | L | - | VL | M | VL | VL | - | L | L | VL | L | VL | VL | - | - | - | - |

*See p.202 for the legend of icons.

**Biomass Power Generation / Impacts (Heat Map)**

[Key Characteristics]

For biomass power generation, “direct water abstraction” and “GHG emissions” associated with feedstock such as wood chips are rated High. “Solid-waste generation” during operations is also rated High.

[Changes from the ENCORE Assessment]

For the operating process, we lowered the risk ratings for “GHG emissions,” “non-GHG air emissions,” and “direct water abstraction” for the same reasons as in Waste to Energy.

Table C-1-6: Biomass Power Generation — Impacts on Natural Capital

| Process | Classification | Area utilised | | | Direct extraction | | Climate change | Pollution | | | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |  |  |
| Procurement | Sawmilling and planing of wood | L | - | - | H | - | H | M | VL | - | M | M | - |
| | Logging | M | M | - | M | M | M | L | L | - | L | L | M |
| Operation | Biomass energy production | L | - | - | L | M | M | H | M | M | H | VL | - |

*See p.202 for the legend of icons.

**Water Business (Water Treatment) / Dependencies (Heat Map)**

[Key Characteristics]

Because equipment in the Water Business is similar to that used in other businesses, we assessed only the operating stage. For stable operation of sewage treatment, it is important that inflows remain stable and are not adversely affected by floods or storms; accordingly, dependencies on “water-flow regulation,” “flood mitigation,” and “storm mitigation” are rated High.

[Changes from the ENCORE Assessment]

Because industrial treatment is used, for the “water collection, treatment and supply” sector, we lowered “rainfall-pattern regulation” from Very High to Very Low and assessed “solid waste remediation” and “water purification” as having no dependency. For the same reason, in “sewage treatment,” “solid waste remediation” was assessed as having no dependency rather than Very High.

Table C-1-7: Water Business (Water Treatment) — Dependencies on Natural Capital

| Process | Classification | Provisioning services | | Regulating and maintenance services | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Operation | Water collection, treatment and supply industry | VL | M | VL | VL | L | M | M | - | M | M | L | VL | VL | - | VL |
| | Sewage treatment | - | L | VL | M | - | VL | VL | M | H | H | H | VL | VL | M | VL |

*See p.202 for the legend of icons.

**Water Business (Water Treatment) / Impacts (Heat Map)**

[Key Characteristics]

Because water-treatment facilities require a certain land area, “area of land use” and “area of freshwater use” in the “water collection, treatment and supply” sector are rated High. In “sewage treatment,” “GHG emissions” are rated High because methane, a GHG, may be generated and released.

[Changes from the ENCORE Assessment]

For “noise/light pollution,” the rating in “sewage treatment” was lowered from Very High to Low because the equipment introduced incorporates appropriate mitigation measures. “Water and soil pollution” and “water and soil eutrophication” were lowered from Very High to Medium because environmental management is rigorously implemented during operations. For “invasive alien species,” we consider that the treatment process presents no realistic pathway for intentional or unintentional introduction of invasive alien species; the rating was therefore changed from Very High to no dependency.

Table C-1-8: Water Business (Water Treatment) — Impacts on Natural Capital

| Process | Classification | Area utilised | | | Direct extraction | Climate change | Pollution | | | | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |
| Operation | Water collection, treatment and supply industry | H | H | - | L | M | M | M | - | L | M |
| | Sewage treatment | L | M | M | L | H | L | M | M | M | L |

*See p.202 for the legend of icons.

**WtX / Dependence (Heat Map)**

[Features]

For WtX, only the collection of waste as raw material and the operation stage were assessed, because the equipment is similar to that used in other projects. As a result, for “Material recovery” in the “Operation” process, “Solid waste remediation” was rated High based on the ENCORE assessment.

[Changes made to ENCORE’s evaluation]

In both "Waste treatment and disposal" and "Remediation activities and other waste management services", "Solid waste remediation" has been changed from Very High to No dependence, as industrial treatment is carried out.

Table C-1-9: WtX Dependencies on Natural Capital

| Process | Classification | Provisioning services | Regulating and maintenance services | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Procurement | Waste treatment and disposal | M | VL | M | VL | VL | - | M | M | VL | L | VL | VL | M | VL |
| Operation | Material recovery | M | VL | M | M | VL | H | - | L | VL | VL | VL | VL | VL | VL |
| | Remediation activities and other waste management services | M | - | M | VL | - | - | M | M | M | M | VL | VL | M | - |

* See p.202 for the legend of icons.

**WtX / Impact (heat map)**

[Features]

In the "Procurement" and "Operation" processes, "Emissions of GHG" are High because fossil fuels or electricity derived from fossil fuels are used. In the "Procurement" process, "Emissions of toxic pollutants to water and soil" and "Emissions of nutrient pollutants to water and soil" are set to High, as the ENCORE rating remains the same, as the current situation outside Japan is not fully understood.

[Changes made to ENCORE's evaluation]

In all processes, "Disturbances (e.g noise, light)" has been lowered from High to Medium, as a certain level of consideration has been given to it in the equipment to be introduced.

Table C-1-10: WtX Impact on natural capital

| Process | Classification | Area utilised | Direct extraction | Climate change | Pollution | | | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |
| Procurement | Waste treatment and disposal | M | M | H | M | H | H | M | M | M |
| Operation | Materials recovery | M | M | M | M | M | - | M | M | M |
| | Remediation activities and other waste management services | M | M | H | M | M | M | M | M | M |

*See p.202 for the legend of icons.

**[Machinery Business field]**

**Machinery Business / Dependence (heat maps)**

[Features]
For the Machinery Business, only design and manufacturing in the company was evaluated, as there is a wide variety of products. As a result, it was found that there were no items rated Very High or High.

[Changes made to ENCORE's evaluation]
No changes have been made to the rating.

Table C-1-11: Machinery Business Dependencies on Natural Capital

| Process | Classification | Provisioning services | Regulating and maintenance services | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Design and manufacture | Manufacture of special-purpose machinery | M | VL | VL | L | VL | L | L | M | M | M | M | VL | L | VL |
| | Manufacture of electronic components and boards | M | VL | VL | L | VL | L | L | M | M | M | M | VL | L | VL |

**Machinery Business / Impact (heat map)**

[Features]
In the "Manufacture of electronic components and boards", the ENCORE rating remains High because the current status of pollution in "Water and Soil" outside Japan is not fully understood.

[Changes made to ENCORE's evaluation]
No changes have been made to the rating.

Table C-1-12: Machinery Business Impacts on Natural Capital

| Process | Classification | Area utilised | Direct extraction | Climate change | Pollution | | | Other |
|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |
| Design and manufacture | Manufacture of special-purpose machinery | L | M | L | L | M | L | M |
| | Manufacture of electronic components and boards | L | L | VL | L | H | L | M |

*See p.202 for the legend of icons.

**[Infrastructure Business field]**

**Infrastructure Business / Dependence (heat map)**

[Features]

In the "Construction and site coordination" and "Infrastructure disposal" processes, the dependence on the regulating and maintenance service "Rainfall pattern regulation" is Very High, due to the weather dependency of the construction period. In the "Procurement" process, the cultural service "Spiritual, Artistic and Symbolic" is Very High in the cement production of the procurement partner, as in the waste incineration power generation process. In addition, due to the importance of water in the steel production of the procurement partner, the supply service "Water Supply" and the regulating and maintenance service "Water Flow Regulation" are relied upon and are High. In the "construction and site coordination" process, the "soil and sediment retention" of the construction site has a significant impact on the construction period and is therefore High. In the "Infrastructure disposal" process, "Solid waste remediation" is rated Very High. This was judged conservatively because, while treatment is carried out in Japan in accordance with the Japanese Waste Disposal and Public Cleansing Act, the actual status of treatment in countries other than Japan is unknown.

[Changes made to ENCORE's evaluation]

No changes have been made to the assessment.

Table C-1-13: Infrastructure Business — Dependencies on Natural Capital

| Process | Classification | Provisioning services | Regulating and maintenance services | | | | | | | | | | | | | | Cultural services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Procurement | Manufacture of basic iron and steel | H | VL | M | L | VL | L | L | M | H | - | M | VL | - | - | VL | - |
| | Manufacture of non-metallic mineral products n.e.c. (>manufacture of articles of concrete, cement and plaster) | M | VL | L | L | VL | L | M | M | M | M | M | VL | - | L | VL | VH |
| Construction and site coordination | Construction of utility projects | M | M | VH | L | VL | H | - | M | M | M | M | VL | - | L | VL | - |
| Infrastructure disposal | Demolition | L | M | VH | L | VL | M | - | M | L | L | L | VL | - | L | VL | - |
| | Waste treatment and disposal | M | VL | M | - | VL | VL | VH | M | M | VL | L | VL | VL | M | VL | - |

*See p.202 for the legend of icons.

**Infrastructure Business / Impact (heat map)**

[Features]

As with refuse incineration power generation, some infrastructure facilities are rated Very High or High because of the associated risks to natural capital and ecosystem impacts due to the use modification of terrestrial, freshwater and marine areas that may occur depending on the location of the facilities. Many of the same items are also rated High.

[Changes made to ENCORE's evaluation]

"Disturbances (e.g. noise, light)" and "Water and soil pollution" in "Procurement" and "Disturbances (e.g. noise, light)" in "Waste treatment and disposal" in "Infrastructure disposal" have been lowered from Very High to Medium, as a certain level of consideration has been given in the equipment to be introduced.

Table C-1-14: Infrastructure Business Impacts on Natural Capital

| Process | Classification | Area utilised | | | Direct extraction | Climate change | Pollution | | | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| Procurement | Manufacture of basic iron and steel | L | - | - | M | H | H | M | - | M | M | - |
| | Manufacture of non-metallic mineral products n.e.c. . (>manufacture of articles of concrete, cement and plaster)) | L | M | - | M | H | H | M | M | M | M | - |
| Construction and site coordination | Construction of utility projects | L | VH | M | L | M | L | H | - | M | H | L |
| Infrastructure disposal | Demolition | VH | H | VH | H | H | H | H | - | M | H | L |
| | Waste treatment and disposal | M | - | - | M | H | M | H | H | M | M | M |

*See p.202 for the legend of icons.

**Pressure vessels, casks and boilers / Dependence (heat map)**

[Features]

Due to the importance of water in the steel production of the procurement partner, the supply service "Water supply" and the regulating service "Water flow regulation" are dependent and are High. In the cask "Infrastructure disposal" process, "Solid waste remediation" is Very High. This was judged conservatively because, while the process is carried out in Japan in accordance with the Japanese Waste Disposal and Public Cleansing Act, the actual status of the process is not known in countries other than Japan.

[Changes made to ENCORE's evaluation]

No changes have been made to the assessment.

Table C-1-15: Pressure Vessels, Casks and Boilers Dependencies on Natural Capital

| Process | Classification | Provisioning services | Regulating and maintenance services | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Procurement (pressure vessels) | Primary steel manufacturing | H | VL | M | L | VL | L | L | M | H | - | M | VL | - | - | VL |
| Design and manufacture (pressure vessels) | Manufacture of structural metal products, tanks, storage tanks and steam generators (> Manufacture of metal tanks, storage tanks and vessels) | M | VL | - | L | VL | L | L | M | M | M | M | VL | - | - | VL |
| Design and manufacture (boilers) | Manufacture of structural metal products, tanks, storage tanks and steam generators (> Steam generator manufacturing) | M | VL | - | L | VL | L | L | M | M | M | M | VL | - | - | VL |
| Infrastructure disposal (casks) | Waste treatment and disposal | M | VL | M | - | VL | VL | VH | M | M | VL | L | VL | VL | M | VL |

*See p.202 for the legend of icons.

**Pressure vessels, casks, boilers / Impact (heat map)**

[Features]

In the "Procurement" process, "Emissions of GHG" and "Emissions of Non-GHG air pollutants" are High because fossil fuels are used in the production of steel by the procurement partners. In addition, the "Emissions of toxic pollutants to water and soil" is rated Very High for the disposal of casks, because the casks contain radioactive waste and leakage cannot be completely ruled out.

[Changes made to ENCORE's evaluation]

With the exception of cask disposal, the ratings for "Disturbances (e.g. noise, light)" and "water and soil pollution" have been lowered from Very High to Medium, as certain considerations have been made in the equipment to be installed.

Table C-1-16: Pressure Vessels, Casks and Boilers Impacts on Natural Capital

| Process | Classification | Area utilised | | | Direct extraction | Climate change | Pollution | | | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| Procurement (pressure vessels) | Manufacture of basic iron and steel | L | - | - | M | H | H | M | - | M | M | - |
| Design and manufacture (pressure vessels) | Manufacture of structural metal products, tanks, reservoirs and steam generators ( > manufacture of tanks, reservoirs and containers of metal) | L | - | - | M | L | L | M | - | L | M | - |
| Design and manufacture (boilers) | Manufacture of structural metal products, tanks, reservoirs and steam generators ( > manufacture of steam generators) | L | - | - | M | L | L | M | - | L | M | - |
| Disposal (cask) | Waste treatment and disposal | M | - | - | M | H | M | VH | H | M | M | M |

*See p.202 for the legend of icons.

### Wind power generation / Dependence (heat map)

[Features]
Wind power generation was assessed only during operation, as the facilities are similar to other projects. Dependence on "Global climate regulation" as the source of wind, which is essential for wind power generation, was rated Very High, while dependence on "Flood mitigation" was rated High for the stable operation of the wind farm.

[Changes made to ENCORE's evaluation]
No changes to the rating.

Table C-1-17: Wind Power Generation Dependencies on Natural Capital

| Process | Classification | Provisioning services | Regulating and maintenance services | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |
| Operation | Wind energy production | VL | VH | M | M | M | H | M | M |

### Wind power generation / Impact (heat map)

[Feature]
Assessed as High for the land-use area from the exclusive area of onshore wind farms.

[Changes made to ENCORE's evaluation]
No changes to the rating.

Table C-1-18: Wind Power Generation Impacts on Natural Capital

| Process | Classification | Area utilised | | Direct extraction | Pollution | | Other |
|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |
| Operation | Wind energy production | H | M | L | VL | VL | M |

*See p.202 for the legend of icons.

**[Carbon Neutral Solution Business field]**

**Marine engines / Dependence (heat map)**

[Features]

There are no items where dependence is Very High or High.

[Changes made to ENCORE's evaluation]

The manufacturing plant for marine engines is located only in Japan and procurement is mostly from Japanese suppliers. As recycled water is mostly used in the manufacture of iron at one of the main suppliers, the High rating for the Supply Service "Water Supply" and the Regulating Service "Water flow regulation" has been lowered to Low.

Table C-1-19: Marine Engine Business Dependencies on Natural Capital

| Process | Classification | Provisioning services | Regulating and maintenance services | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Procurement | Manufacture of basic iron and steel | L | VL | M | VL | VL | L | L | M | L | - | M | VL | - | VL |
| Design and manufacturing | Manufacture of general-purpose machinery ( >manufacture of engines and turbines) | M | VL | VL | L | VL | L | L | M | M | M | M | VL | L | VL |

**Marine engines / Impact (heat map)**

[Features]

In the "Procurement" process, "GHG emissions" and "Non-GHG emissions" are High because fossil fuels are used in the production of steel at the procurement destination.

[Changes made to ENCORE's evaluation]

In the "Procurement" process, "Disturbances (e.g. noise, light)" and "Water/soil pollution" have been lowered from Very High to Medium because most procurement for the marine-engine manufacturing plant is from suppliers in Japan.

Table C-1-20: Marine Engine Business Impacts on Natural Capital

| Process | Classification | Area utilised | Direct extraction | Climate change | Pollution | | | Other |
|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |
| Procurement | Manufacture of basic iron and steel | L | M | H | H | M | M | M |
| Design and manufacturing | Manufacture of general-purpose machinery (> manufacture of engines and turbines) | L | M | L | M | M | L | M |

*See p.202 for the legend of icons.

# C.2 Financial Impacts and Mitigation Measures for Climate-and Nature-related Risks

The following section describes the financial impact and mitigation measures along the value chain for those businesses/processes with a high risk(dependence/impact Very High (VH) or High (H))in the assessment in **Section C.1**. The financial impact (in a single year) of Kanadevia Group as a whole for each item is rated on a three-point scale: large (over JPY 10 billion), medium (JPY 1 billion to JPY 10 billion), and small (less than JPY 1 billion), with those with large and medium results listed.

Table C-2-1: Businesses / Processes with High Nature-related Risks

| Processes | | Environment Business | | | | | Infrastructure Business | Carbon Neutral Solution Business | | | | | Machinery Business | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | WtE | Biomass Power generation | Biogas | Water | WtX | | Wind Power | Boilers | Pressure vessel | Casks | Marine Engine | Industrial machinery | Semiconductor equipment |
| Procurement | Steel manufacturing | v | x | x | x | x | x | x | x | x | x | v | | |
| | Cement production | v | x | x | x | x | x | x | | | | | | |
| | Manufacture of special industrial Machinery Business | v | x | x | x | x | | x | x | | | x | | |
| | Logging | | v | | | | | | | | | | | |
| | Sawing of timber | | v | | | | | | | | | | | |
| | Waste disposal | | | | | v | | | | | | | | |
| Design and Manufacturing | Manufacture of special industrial Machinery Business | v | | | | | | | | | | | v | |
| | Manufacture of electronic components | | | | | | | | | | | | | v |
| | Engine manufacturing | | | | | | | | | | | v | | |
| | Boiler manufacturing | | | | | | | | v | | | | | |
| | Tank manufacturing | | | | | | | | | v | | | | |

Legend

VH / H for dependence and Impacts | VH / H for dependence only | VH / H for impacts only | v : Items listed in the analysis results | x: Items not mentioned in the analysis results as being equivalent to WtE projects

Table C-2-1: Businesses / Processes with High Nature-related Risks (continued)

| Processes | | Environment Business | | | | | Infrastructure Business | Carbon Neutral Solution Business | | | | | Machinery Business | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | WtE | Biomass Power generation | Biogas | Water | WtX | | Wind Power | Boilers | Pressure vessel | Casks | Marine Engine | Industrial machinery | Semiconductor equipment |
| Construction | Construction | v | x | x | x | x | x | x | | | | | | |
| | Public works | | | | | | v | | | | | | | |
| During construction Disposal | Construction | v | x | x | x | x | x | x | | | | | | |
| | Waste management | v | x | x | x | x | x | x | | | | | | |
| Operation | WtE | v | | | | | | | | | | | | |
| | Biomass power generation | | v | | | | | | | | | | | |
| | Waste treatment | | | v | | | | | | | | | | |
| | Water treatment | | | | v | | | | | | | | | |
| | Sewage treatment | | | | v | | | | | | | | | |
| | Material reclamation industry | | | | | v | | | | | | | | |
| | Purification | | | | | v | | | | | | | | |
| | Wind Power Generation | | | | | | | v | | | | | | |
| Disposal | Dismantling | v | x | x | x | x | v | x | | | | | | |
| | Waste management | v | x | x | x | x | v | x | x | x | v | x | x | x |

Legend

VH / H for dependence and Impacts | VH / H for dependence only | VH / H for impacts only | v : Items listed in the analysis results | x : Items not mentioned in the analysis results as being equivalent to WtE projects

**[Nature-related risks related to the upstream of the supply chain]**

**Steel production (production of iron used across all operations)**

| Dependency and Impact on Main Items | Risk Classification | Risk Type | Risk Overview | Financial Impacts | | Risk Mitigation Measures |
|---|---|---|---|---|---|---|
| **Water resources (water use) in the production of iron, a raw material for machinery and equipment** | Physical Risk | Acute | - Production restrictions due to inability to secure water<br>- Landslides and land subsidence caused by excessive water use<br>- Depletion of water resources | - Suspension of engineering activities and decline in sales due to inability to procure iron following a halt in iron production<br>- Penalties payable to customers and commissioning parties | **Large** | Procurement from suppliers that produce iron with limited water use and/or recycled water |
| | | Chronic | - Declining water resources<br>- Drought due to continuous water scarcity | Prolonged suspension of engineering activities and decline in sales due to inability to procure iron | **Large** | |
| | Transition Risk | Policy | Curtailment or suspension of iron production due to restrictions on water abstraction from the government | Suspension of production and engineering of Machinery Business and other equipment due to difficulties in procuring iron, resulting in reduced sales | **Medium** | |
| | | Policy | Restriction/stoppage of iron production due to water abstraction restrictions from government | Production and engineering of Machinery Business etc. suspended and sales reduced due to difficulties in procuring iron | **Medium** | |
| **GHG & non-GHG emissions in the production of iron, a raw material for machinery and equipment** | Transition Risk | Policy | Tighter regulation of GHG & non-GHG emissions (e.g. levies, tax increases) | - Investment in installing additional GHG & non-GHG treatment facilities<br>- Increased levies/taxes<br>- Increase in production costs | **Medium** | Procurement from suppliers that produce iron with low GHG & non-GHG emissions in the manufacturing process due to introduction of additional GHG & non-GHG treatment facilities, etc. |
| | | Market | Increased preference of local communities and residents for equipment using iron with low GHG & non-GHG emissions | Additional costs for sourcing iron with low GHG & non-GHG emissions | **Medium** | |
| | | Technology | Establishment and application of technologies to reduce GHG & non-GHG emissions (low emission production and emissions absorption) | Reduction of GHG & non-GHG emissions (investment in technology development such as low emission manufacturing, emissions absorption, etc.) | **Medium** | |

*The financial impact was assessed for a single year on a scale of large (over 10 billion JPY), medium (10 billion JPY to 1 billion JPY) and small (less than 1 billion JPY), with results for large and medium being shown.

### Cement Production (Production of Steel used in Environment Business, Infrastructure Business and Wind Power Generation Business)

| Dependency and Impact on Main Items | Risk Classification | Risk Type | Risk Overview | Financial Impact | | Risk Mitigation Measures |
|---|---|---|---|---|---|---|
| **GHG & non-GHG emissions in raw material cement production** | Transition Risk | Policy | Tighter regulations on GHG & non-GHG emissions (levies, tax increases, etc.) | - Investment in installing additional GHG & non-GHG treatment facilities<br>- Increased levies/taxes<br>- Increase in production costs | **Medium** | Procurement from suppliers that produce cement with low GHG & non-GHG emissions in the manufacturing process due to introduction of additional GHG & non-GHG treatment facilities, etc. |

### Sawmilling (Production of Biomass Power Fuels for use in Biomass Power Generation)

| Dependency and Impact on Main Items | Risk Classification | Risk Type | Risk Overview | Financial Impact | | Risk Mitigation Measures |
|---|---|---|---|---|---|---|
| **Water use in the production of wood chips and other biomass fuels for biomass power generation** | Physical Risk | Acute | - Production of wood chips etc. restricted due to inability to procure water<br>- Landslides and land subsidence due to excessive water use<br>- Depletion of water resources | Suspension of power generation due to inability to procure wood chips, etc., resulting in reduced sales | **Medium** | Procurement from suppliers that produce wood chips and other biomass fuels with limited water use and/or recycled water |
| | | Chronic | - Decrease in water resources<br>- Continuous production constraints on wood chips and other biomass fuels due to water shortages | Inability to procure wood chips and other biomass fuels, leading to prolonged suspension of power generation, lower sales, and business withdrawal | **Large** | |
| | Transition Risk | Policy | Suspension of production of woodchips, etc. due to restrictions on water abstraction from government | Decrease in sales due to suspension of power generation due to inability to procure wood chips, etc. | **Medium** | |

### Construction and Construction Waste (Construction of the Environment, Infrastructure, and Wind Power Generation Businesses)

| Dependency and Impact on Main Items | Risk Classification | Risk Type | Risk Overview | Financial Impact | | Risk Mitigation Measures |
|---|---|---|---|---|---|---|
| **Stable weather (rainfall patterns/ climate)** | Physical Risk | Chronic | Expansion of areas inaccessible for work due to unstable weather | Decrease in number of orders and sales | **Medium** | Implementation of construction and construction-time disposal using more weather-insensitive construction methods |
| | Transition Risk | Market | Increased preference for orders from companies with stable construction periods | Decrease in number of orders and sales | **Medium** | |

*The financial impact was assessed for a single year on a scale of large (over 10 billion JPY), medium (10 billion JPY to 1 billion JPY) and small (less than 1 billion JPY), with results for large and medium being shown.

**[Climate and Nature-related Risks for Own/Downstream ]**

**Operation (LNG Thermal Power Generation, Biomass Power Generation, Biogas)**

| Dependency and Impact on Main Items | Risk Classification | Risk Type | Risk Overview | Financial Impact | | Risk Reduction Measures |
|---|---|---|---|---|---|---|
| **Water resources in operation (water use, surface water, groundwater)** | Physical Risk | Acute | - Production restricted due to lack of water availability<br>- Landslides and land subsidence due to excessive water use<br>- Depletion of water resources | - Production stoppage of Machinery Business and other equipment, resulting in reduced sales<br>- Suspension of engineering and incineration facility operations due to inability to procure equipment, resulting in reduced sales<br>- Penalties to suppliers and contractors | **Medium** | - Machinery Business manufactured with low water use/water reuse, procurement from suppliers<br>- Machines manufactured in-house, machines manufactured by low water use/water reuse |
| | | Chronic | - Declining water resources<br>- Ongoing production restrictions due to water scarcity | Ongoing suspension of engineering activities and reduced sales due to inability to procure equipment | **Medium** | |
| | Transition Risk | Policy | Restriction or cessation of production of Machinery Business and other equipment due to water abstraction restrictions from the government | - Decrease in sales due to suspension of production of Machinery Business and other equipment<br>- Suspension of engineering and incineration facility operations due to inability to procure equipment, resulting in reduced sales | **Medium** | |
| **Pollution of air, soil, etc. due to GHGs and hazardous substances generated during construction (GHGs, soil pollution, water pollution)** | Physical Risk | Acute | Increase in pollutant emissions due to malfunctions or accidents in drainage and exhaust systems | - Pollutant removal costs<br>- Fines<br>- Litigation costs | **Medium** | Use of construction methods with lower emissions during the construction process, e.g. by installing additional GHG & pollutant treatment equipment |
| | Transition Risk | Policy | - Tighter regulations on pollutant emissions<br>- Levies and taxes on GHG emissions | - Investments in installation of additional pollutant treatment equipment<br>- Increased levies and taxes<br>- Rising production costs of wood chips and other materials, rising costs of power generation | **Medium** | |

*The financial impact was assessed for a single year on a scale of large (over 10 billion JPY), medium (10 billion JPY to 1 billion JPY) and small (less than 1 billion JPY), with results for large and medium being shown.

### Operation (Biomass Power Generation)

| Dependency and Impact on Main Items | Risk Classification | Risk Type | Risk Overview | Financial Impact | | Risk Reduction Measures |
|---|---|---|---|---|---|---|
| **Solid waste generation and release** | Physical Risk | Chronic | Shutdown due to depletion of final disposal sites for incineration residue and ash | - Investments in the installation of additional waste treatment equipment<br>- Opportunity loss due to curtailment of operations due to depletion of final disposal sites | **Medium** | Operation with less incineration residue/incinerator ash/reuse due to improved combustion technology, etc. |
| | Transition Risk | Policy | Tighter restrictions and penalties on types and quantities of waste | - Investments in additional incineration residue/incinerator ash treatment equipment<br>- Increase in levies and taxes<br>- Increase in production costs | **Medium** | |

### Operation (Water Treatment)

| Dependency and Impact on Main Items | Risk Classification | Risk Type | Risk Overview | Financial Impact | | Risk Mitigation Measures |
|---|---|---|---|---|---|---|
| **GHG emissions generated by operations** | Transition Risk | Policy | Tighter regulations on GHG emissions (e.g. levies, tax increases) | - Investment in installing additional GHG treatment facilities<br>- Increase in levies and taxes<br>- Increase in production costs | **Medium** | Additional GHG use of construction methods with lower emissions in the construction process, e.g. through the introduction of treatment facilities |

### Operation (Wind Power Generation)

| Dependency and Impact on Main Items | Risk Classification | Risk Type | Risk Overview | Financial Impact | | Risk Mitigation Measures |
|---|---|---|---|---|---|---|
| **Stable climatic conditions (climate regulation and flood mitigation)** | Physical Risk | Chronic | Expansion of areas where operations cannot continue due to unstable weather conditions | Decrease in orders and operating projects, resulting in lower sales | **Large** | Operations using technologies that are less susceptible to weather impacts |
| | Transition Risk | Market | Growing customer preference for companies capable of stable operation | Decrease in orders, resulting in lower sales | **Large** | |

*The financial impact was assessed for a single year on a scale of large (over 10 billion JPY), medium (10 billion JPY to 1 billion JPY) and small (less than 1 billion JPY), with results for large and medium being shown.

**Construction, On-site coordination and Disposal (WtE/Biomass Power Generation/Infrastructure Construction and Disposal)**

| Dependency and Impact on Main Items | Risk Classification | Risk Type | Risk Overview | Financial Impact | | Risk Mitigation Measures |
|---|---|---|---|---|---|---|
| **Stable during construction Weather (rainfall patterns/climate)** | Physical Risk | Chronic | Expansion of areas inaccessible for work due to unstable weather | Decrease in number of orders and sales | **Medium** | Implementation of construction and disposal using construction methods less impacted by weather conditions |
| | Transition Risk | Market | Increased preference for orders from companies with stable construction periods | Decrease in number of orders and sales | **Medium** | |
| **Water use in construction** | Physical Risk | Chronic | - Construction halts due to permanent unavailability of water required for production<br>- Depletion of water resources | Business withdrawal and lost opportunities due to continuous construction stoppages | **Large** | Implementation of construction using construction methods that use less water and reuse water |
| | Transition Risk | Policy | Restriction or suspension of construction due to water abstraction restrictions from the government | - Penalties payable to the customer or commissioning client due to delays in construction<br>- Business withdrawal/opportunity loss due to continuous suspension of construction<br>- Additional capital investment in water treatment facilities and other facilities to reuse used water | **Medium** | |
| **Solid waste in the construction of waste incineration and power generation facilities** | Physical Risk | Chronic | Construction halted due to depletion of landfill sites for metal, plastic and other waste generated by construction | - Investments in the installation of additional waste treatment equipment<br>- Increase in construction costs<br>- Operational constraints and lost opportunities due to depletion of final disposal sites | **Medium** | Implementation of construction using construction methods that generate less waste through reuse of waste materials, etc. |
| | Transition Risk | Policy | Tighter regulations and penalties for types and quantities of waste | - Investments in the introduction of additional waste treatment equipment<br>- Increased levies and taxes<br>- Increase in production costs | **Medium** | |

*The financial impact was assessed for a single year on a scale of large (over 10 billion JPY), medium (10 billion JPY to 1 billion JPY) and small (less than 1 billion JPY), with results for large and medium being shown.

# C.3 Climate- and Nature-related Opportunities and Financial Impacts

The Kanadevia Group assesses climate- and nature-related opportunities and financial impacts along the value chain, reflecting insights gained from controlling and reducing environmental impacts from construction and on-site commissioning through operation, maintenance, and disposal into marketing, procurement, design, and development.

Table C-3-1: Climate- and Nature-related Opportunities and Financial Impacts. Impact level: Large > JPY 10 billion; Medium = JPY 1-10 billion; Small < JPY 1 billion. Only Large and Medium items are shown.

| Value chain | Process | Impact | Opportunity | Financial Impact Level Magnitude | |
|---|---|---|---|---|---|
| Marketing | - | **GHG/non-GHG emissions**<br>GHG/non-GHG emissions may cause climate change and pollution, disrupting ecosystem balance. | Growing customer preference for machinery and facilities with lower adverse impacts on nature through reduced emissions. | Providing GHG/non-GHG reduction solutions at the right time and place may create competitive advantage.<br>- Converting open-dumping areas to WtE to suppress methane emissions. | **Large** |
| | - | **Water use**<br>Reduced water resources may constrain ecosystems and local residents. | Growing customer preference for facilities that improve water use. | Deploying these solutions in more regions and at an earlier stage that improve water use for nature and people may create competitive advantage.<br>- Mine wastewater<br>- Factory wastewater<br>- Sewage treatment. | **Large** |
| | - | **Solid waste disposal**<br>Solid waste can adversely affect natural capital. | Growing customer preference for manufacturing with lower waste generation and the circular economy. | Providing solid-waste reduction as a value-chain solution in appropriate locations may create competitive advantage.<br>- WtE & WtX in open-dumping areas. | **Large** |
| Technology | - | **GHG/non-GHG emissions**<br>GHG/non-GHG emissions may cause climate change and pollution, disrupting ecosystem balance. | Growing customer preference for machinery and facilities with lower adverse impacts on nature through reduced emissions. | Moving ahead of peers in emission-reduction technologies may create competitive advantage.<br>- Decarbonisation technologies<br>- Durable membrane chimneys that reduce lifecycle $CO_2$ and purify $NO_x$. | **Large** |
| | - | **Water use**<br>Reduced water resources may constrain ecosystems and local residents. | Growing customer preference for facilities that reduce water use or treat wastewater faster, safer, and at larger scale. | Moving ahead in water-use and water-treatment technologies such as RO membranes may create competitive advantage.<br>- RO membranes | **Medium** |
| | - | **Solid waste disposal**<br>Solid waste can adversely affect natural capital. | Policy support and incentives may increase for low-waste manufacturing technologies. | Moving ahead in technologies that reduce solid waste, including sorting and materials recovery, may create competitive advantage.<br>- Sorting technology<br>- Materials recovery technology | **Medium** |

Table C-3-1: Climate- and Nature-related Opportunities and Financial Impacts (continued)

| Value chain | Process | Impact | Opportunity | Financial Impact Level Magnitude | |
|---|---|---|---|---|---|
| **Procurement** | Iron and steel manufacturing | **GHG/non-GHG emissions**<br>GHG/non-GHG emissions may disrupt ecosystem balance through climate change and pollution. | Growing customer preference for machinery and facilities with lower adverse impacts on nature. | Moving ahead of peers in reducing GHG/non-GHG emissions may create competitive advantage. | **Large** |
| | | **Water use**<br>Reduced water resources may constrain ecosystems and local residents. | Growing preference among municipalities and residents for facilities using steel manufactured with less water, including reused water. | Although challenging, opportunities may be created through collaboration with suppliers. | **Medium** |
| | Cement manufacturing | **GHG/non-GHG emissions**<br>GHG/non-GHG emissions may disrupt ecosystem balance through climate change and pollution. | Growing customer preference for machinery and facilities with lower adverse impacts on nature. | Moving ahead of peers in reducing GHG/non-GHG emissions may create competitive advantage. | **Medium** |
| | Sawmilling | **GHG/non-GHG emissions**<br>GHG/non-GHG emissions may disrupt ecosystem balance through climate change and pollution. | Growing customer preference for biomass fuel production with lower adverse impacts on nature. | Although challenging, opportunities may be created through collaboration with suppliers. | **Medium** |
| | | **Water use**<br>Reduced water resources may constrain ecosystems and local residents. | Growing customer preference for biomass fuel production with lower adverse impacts on nature. | Supplier collaboration and leadership in water-use and water-treatment technologies may create competitive advantage. | **Large** |
| **Operations** | - | **GHG/non-GHG emissions**<br>GHG/non-GHG emissions may disrupt ecosystem balance through climate change and pollution. | Growing customer preference for facility operations with lower adverse impacts on nature. | Through contracted operations, moving ahead of peers in reducing facility GHG emissions may create bidding advantages. | **Large** |
| | - | **Solid waste disposal**<br>Solid waste can adversely affect natural capital. | Growing preference for low-waste manufacturing and the circular economy; improved reputation and corporate value through positive business impacts. | Moving ahead of peers in solid-waste reduction may create competitive advantage. | **Large** |

*The financial impact was assessed for a single year on a scale of large (over 10 billion JPY), medium (10 billion JPY to 1 billion JPY) and small (less than 1 billion JPY), with results for large and medium being shown.

# D. Procurement-related Analysis

# D.1 LCA Analysis

To achieve net-zero environmental impacts, the Kanadevia Group must consider opportunities to reduce environmental impacts in procurement. This fiscal year, to support improvements in product design and supplier engagement aimed at reducing the environmental impacts of purchased goods, we identified materials with large environmental impacts by impact category. Purchased items were classified into nine material categories - steel, machinery and equipment, non-ferrous metals, petrochemical products, gases, textiles, glass, services, and other. The principal items in each category are as follows.

- Steel: Steel pipes, steel plates, steel products, bolts and nuts, etc.
- Machinery and equipment: switchgear, machinery, pumps, control panels, etc.
- Non-ferrous metals: rolled aluminum products, copper and stainless-steel products, wiring devices, etc.
- Petrochemical products: plastic products, synthetic resins, various rubber components, etc.
- Gases: compressed gases, liquid nitrogen, ammonia gas, etc.
- Textiles: textile products (filters, etc.), clothing, and other items
- Glass: tempered glass, heat-resistant glass, glass fibre, etc.
- Services: design, on-site construction, measurement and analysis, maintenance and inspections, etc.
- Other: wood products, general office supplies, cement, etc.

The assessment uses life cycle assessment (LCA). LCA is a method for quantitatively evaluating the environmental impacts of a product or service across its entire life cycle, from raw-material extraction through disposal and recycling.

In the procurement life cycle impact assessment (LCIA), we calculated environmental impacts by multiplying the monetary value of purchased items for each product sold by the Group in FY 2025 by the corresponding IDEA product intensity factor and aggregating the results.

The LCIA assessment was conducted under the following conditions.

Data used: Kanadevia Group procurement data for FY 2025

LCA database: AIST-IDEA[100] Ver. 3.5

LCIA assessment: LIME3[101]

AIST-IDEA (Inventory Database for Environmental Analysis) is one of the world's largest inventory databases for life cycle assessment (LCA). Developed by the National Institute of Advanced Industrial Science and Technology (AIST), it contains data for approximately 9,500 or more processes and covers nearly all economic activities, including agriculture, forestry and fisheries, industrial products, and services. Using AIST-IDEA enables higher-resolution identification of the processes that matter most.

LIME3 is a life cycle impact assessment (LCIA) method developed in Japan that evaluates environmental impacts across the life cycle of products and services using areas of protection such as human health, biodiversity, social assets, and primary production, and integrates different impacts into a common unit such as monetary value. LIME3 enables assessment of environmental impacts beyond GHG emissions. In this analysis, environmental-impact values were evaluated using the following calculation.

Environmental impact = (1) weight or sales value of purchased items for products sold x (2) IDEA product intensity factor

Because many of the items are consumed in Japan and their use does not differ substantially from global consumption patterns, the estimate was provisionally calculated on the assumption that the items were consumed in Japan.

LIME3 evaluates climate change, human health, social assets, biodiversity, primary production, and water resources based on defined areas of protection (endpoints).

For the LCIA results, we conducted Pareto analysis[102] to identify which material categories in the Group's procurement data have the largest impacts. Pareto analysis identifies the relatively small number of factors that account for a large share of the overall result and is used to prioritise improvement and decision-making. Applying Pareto analysis makes it possible to visualize which of the nine material categories have particularly large impacts. The results are as follows.

**Climate Change**

Among the Kanadevia Group's purchased goods, machinery and equipment had the largest impact on climate change, followed by petrochemical products and steel. These three categories accounted for approximately 70% of emissions associated with purchased goods.

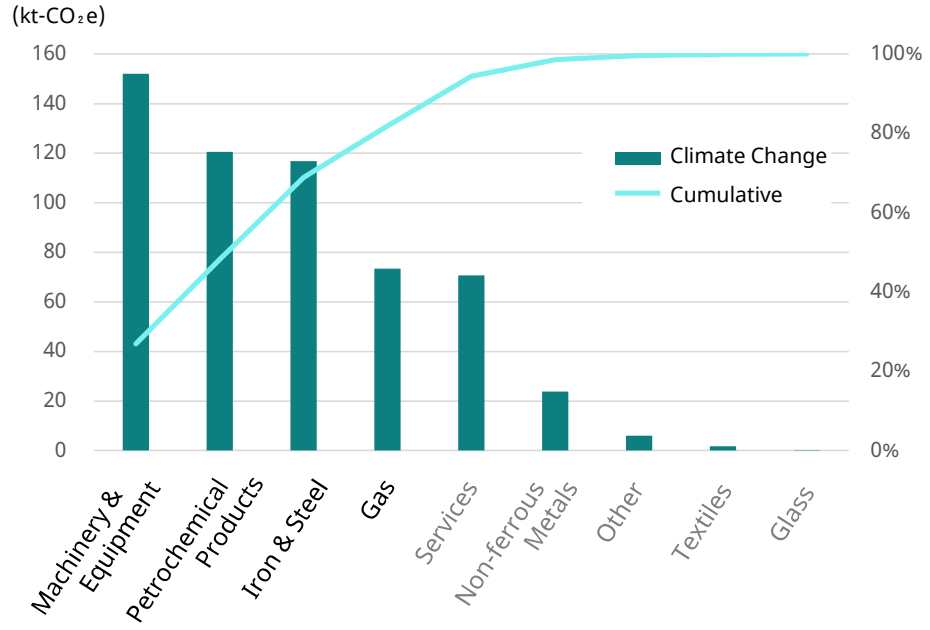



Figure D-1-1: Analysis Results for Material-related Impacts on Climate Change

### Human Health

Human-health impacts are measured as loss of healthy life expectancy using disability-adjusted life years (DALYs), capturing effects on human health from air pollutants, hazardous chemicals, climate change, and other factors.

Among the Kanadevia Group's purchased goods, machinery and equipment had the largest impact on human health, followed by steel and petrochemical products. The top three categories accounted for approximately 70% of the overall impact.

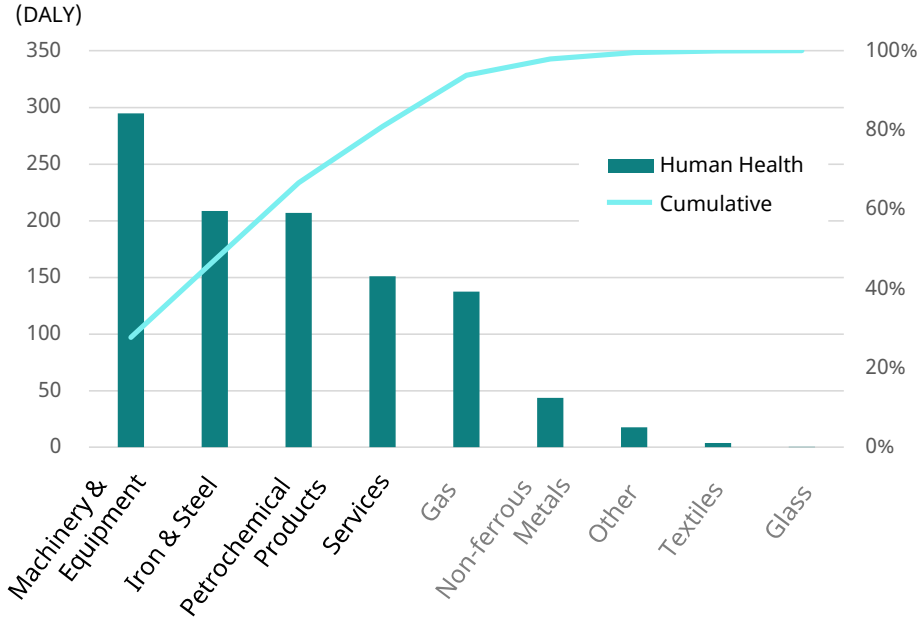



Figure D-1-2: Analysis Results for Material-related Impacts on Human Health

### Social Assets

Social assets are evaluated in terms of damage to societal assets - such as buildings, infrastructure, and land - using the monetary value of asset losses and restoration costs.
Among the Kanadevia Group's purchased goods, petrochemical products had the largest impact on social assets, accounting for approximately 60% on its own, followed by gases and machinery and equipment. The top three categories accounted for approximately 90% of the overall impact.
For the top two categories, petrochemical products and gases, impacts include losses of social assets associated with resource extraction and fuel transportation. The current analysis indicates damage to social assets of approximately USD 930 million (approximately JPY 147 billion).

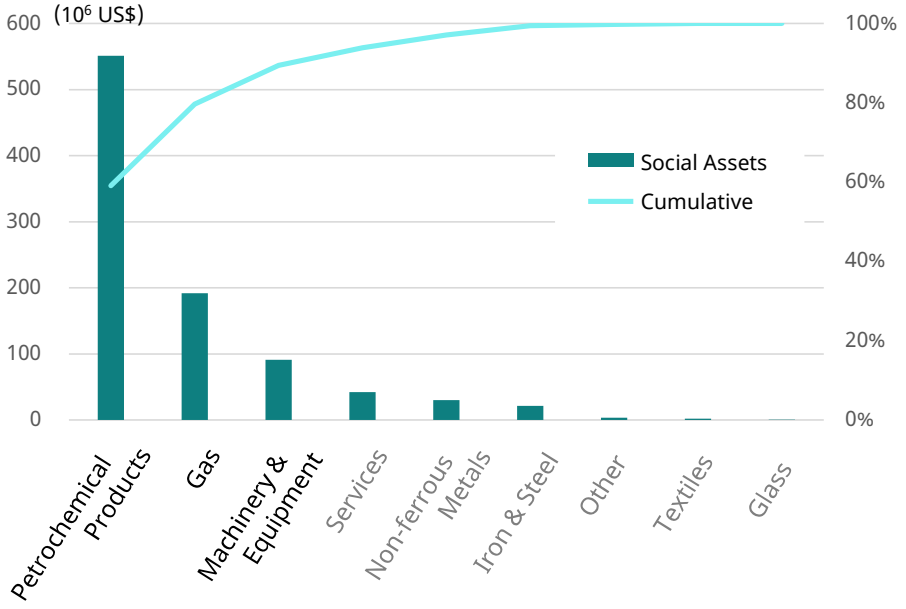



Figure D-1-3: Analysis Results for Material-related Impacts on Social Assets

**Biodiversity**

Among the Kanadevia Group's purchased goods, gases had the largest impact on biodiversity, followed by services and machinery and equipment. These three categories accounted for approximately 70% of the biodiversity impact. Biodiversity (extinction risk) is evaluated using EINES (Expected Increase in Number of Extinct Species), an indicator estimating the increase in the number of species expected to become extinct.

For gases, the results indicate that emissions of air pollutants from combustion, as well as resource extraction and fuel transportation, affect living organisms. For services, land-use change associated with on-site construction and similar activities is considered to have a relatively large impact, suggesting that these activities may also affect biodiversity.

The total biodiversity damage impact was approximately 0.0016 EINES, indicating that the biodiversity impact associated with the Group's procured items is small.

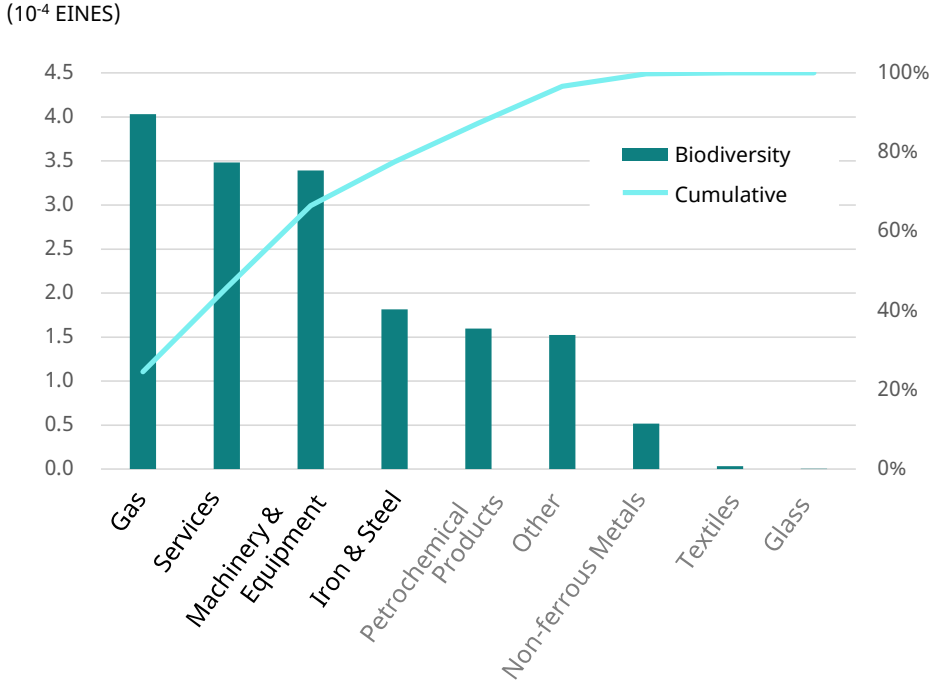



Figure D-1-4: Analysis Results for Material-related Impacts on Biodiversity

**Primary Production**

Primary production is evaluated based on the reduction in net primary production (NPP), which indicates the extent to which the productive capacity generated by natural photosynthesis - including forests, crops, and fishery resources - is impaired.

Among the Kanadevia Group's procured items, services had the largest damage impact on primary production, accounting for slightly less than half of the total and far exceeding the other categories. Machinery and equipment ranked second, followed by other. Together, the top three categories accounted for approximately 70% of the total impact.

In LCA, primary production refers mainly to the total amount of organic matter produced through plant activity. It is an important factor in assessing ecosystems other than humans and serves, in particular, as an indicator of environmental impacts on plant-based organisms. The analysis indicates that services affect approximately 18,000 tonnes of plant-derived organic matter through on-site construction and related activities.

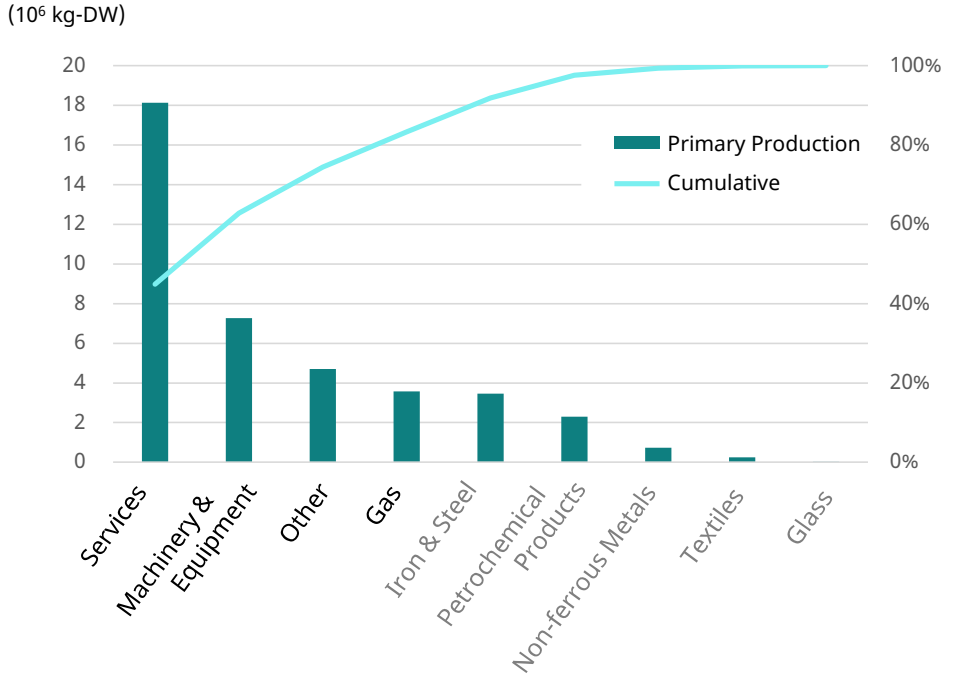



Figure D-1-5: Analysis Results for Material-related Impacts on Primary Production

**Water Resources**

Among the Kanadevia Group's procured items, services had the highest water-resource consumption, followed by other and machinery and equipment. The top three categories accounted for approximately 70% of the water-resource impact.

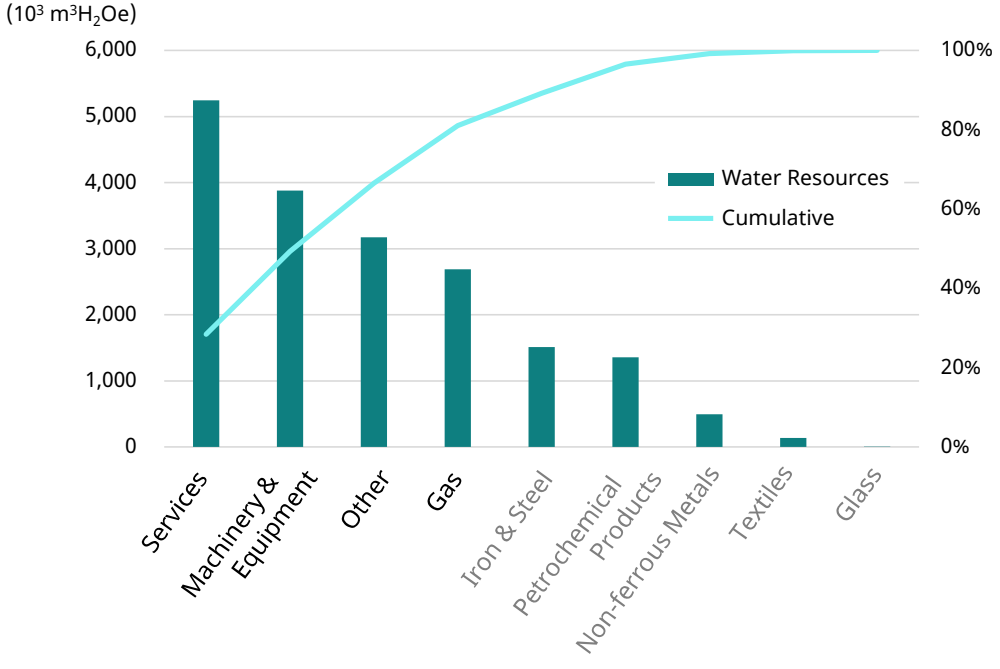



Figure D-1-6: Analysis Results for Material-related Impacts on Water Resources

**Summary**

As in the previous fiscal year, this analysis used a high-resolution LCA database, enabling us to assess a broad range of environmental impacts beyond GHG emissions and to identify the material categories with the largest impacts.

Overall, petrochemical products had a particularly large impact on social assets, while services had a particularly large impact on primary production. Machinery and equipment, gases, and steel were found to affect a broad range of impact areas. By contrast, textiles and glass, which represent relatively small procurement amounts, also had relatively small impacts.

These assessment results indicate that the impact areas in which improvement can be most effective differ by material category. To provide comprehensive coverage, this analysis used purchase value; however, assessments based on purchase value involve greater uncertainty than assessments based on physical quantities.

We will prioritise initiatives towards achieving net-zero environmental impacts. Specifically, we plan to narrow the scope to selected materials, conduct assessments using physical quantities rather than monetary values, and perform simulations of the effects of adopting environmentally preferable materials. In parallel, we will engage with major suppliers for each material category to promote the use of environmentally preferable materials.

Because the marine-engine business was deconsolidated and the Kanadevia Group withdrew from the bridge business at the end of March 2025, impacts associated with these businesses will no longer be included from FY2026.

Table D-1-1: Heat Map of Impact Assessment Results

| Material / Service | Climate Change | Human Health | Social Assets | Biodiversity | Primary Production | Water Resources |
|---|---|---|---|---|---|---|
| Steel | 20.7% | 19.6% | 2.3% | 11.1% | 8.6% | 14.5% |
| Machinery and Equipment | 26.9% | 27.7% | 9.8% | 20.7% | 18.0% | 17.2% |
| Non-ferrous Metals | 4.2% | 4.1% | 3.2% | 3.2% | 1.8% | 2.7% |
| Petrochemical Products | 21.3% | 19.4% | 59.1% | 9.8% | 5.7% | 7.3% |
| Gas | 13.0% | 12.9% | 20.6% | 24.6% | 8.9% | 8.2% |
| Textiles | 0.3% | 0.4% | 0.2% | 0.2% | 0.6% | 0.7% |
| Glass | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Services | 12.5% | 14.2% | 4.5% | 21.2% | 44.9% | 28.4% |
| Other | 1.1% | 1.7% | 0.4% | 9.3% | 11.6% | 21.0% |

* The charts show the contribution ratios by material and service for each impact area. The total for each column is 100%. Darker colours indicate higher contribution ratios. Due to display limitations, values greater than 0% but less than 0.05% are displayed as "0.0%."

# D.2 SAQ Initiatives

Advancing sustainability initiatives requires the understanding and cooperation of suppliers throughout the supply chain. Accordingly, in addition to safety and quality, the Kanadevia Group seeks to actively select suppliers that are evaluated from the perspectives of fair and equitable transactions, human rights, environmental conservation, corporate ethics, and prevention of personal and confidential information leakage, and that continuously improve their practices. Specifically, the Group has set a sustainable-procurement target of achieving a Sustainability Promotion Score of 80 or higher for all suppliers by 2050, represented by an assessment rate of 80% or more under the Self-Assessment Questionnaire (SAQ) developed by the Global Compact Network Japan. As described in **Chapter 2**, the Group has established its Basic Procurement Policy and uses the GCNJ SAQ to conduct sustainability surveys to confirm whether the supply chain conforms to the policy.

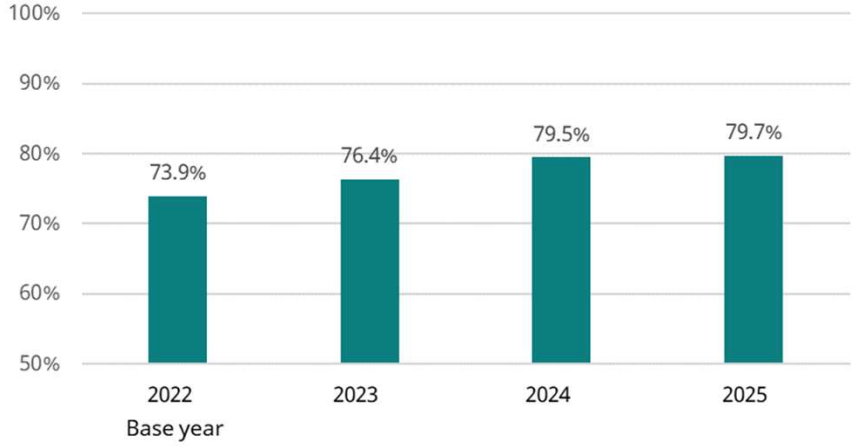



Figure D-2-1: Average Score Rate

In FY 2025, the survey covered 611 suppliers representing 80.7% of total procurement value and achieved a response rate of 80.9%, marking the fifth consecutive year above 80%. The average assessment score was 79.7%, representing an improvement of 5.8 percentage points compared with FY2022, the KPI base year. In addition, the improvement rate calculated in accordance with the KPI methodology was 7.8%, achieving the target of an improvement of at least 7.0% compared with the base year. Suppliers have commented positively on feedback such as comparisons with average scores and radar charts, noting that it is useful for internal explanations. The Group will issue guidelines that explain its procurement policy in an easy-to-understand manner, deepen communication with supply-chain companies, and pursue continuous improvement in sustainable procurement through dialogue that emphasises two-way engagement. It will also enhance engagement and promote value creation through co-creation.




Figure D-2-2: Example of Feedback to Suppliers on SAQ Scores

# D.3 Supplier Human Rights DD and Business Partner Compliance / Trading Practice Survey

This section presents two complementary initiatives: supplier human rights due diligence, which is designed to identify human-rights risks in the supply chain, and the supplier compliance survey, which reviews the Kanadevia Group's trading practices from suppliers' perspectives. The former assesses potential human-rights risks and management practices at suppliers, while the latter examines how the Group's ordering, contracting, communications, and other practices affect suppliers and the people who work for them. By combining the two, we seek to understand supply-chain risks not from a one-way perspective, but in terms of the relationship between the parties.

### D.3.1 Scope and Methodology of Supplier Human Rights Due Diligence

The initial human rights due diligence being conducted in 2026 applied risk-based screening to 3,368 suppliers identified by the Procurement Headquarters in order to identify business partners that should be prioritised for additional confirmation. For 494 companies[103)] of these suppliers that responded to the GCNJ common SAQ in 2024, the response results were also used in the assessment. This assessment does not cover the entire supply chain; it is an initial assessment of suppliers under the jurisdiction of the Procurement Headquarters. The analysis used country-level human-rights risks for the 20 countries in which suppliers are located, human-rights issues more likely to arise by industry, peer-company disclosures, supplier attributes such as country and industry, and GCNJ common SAQ responses. The SAQ analysis covered responses concerning human rights, labour, CSR-related corporate governance, supply chains, and coexistence with local communities.

The assessment covered 26 human-rights issues and evaluated them based on the severity and likelihood of negative impacts. Severity was assessed in terms of the scale of the impact, the scope of people affected, and the difficulty of restoring affected people to their prior condition. For human-rights impacts, we also considered that issues of high severity require priority attention even when their likelihood is low.

Supplier-level prioritisation used two axes: likelihood of human-rights risk and impact on the Kanadevia Group's business. Likelihood of human-rights risk was assessed based on the human-rights issue assessment, whether the supplier had responded to the SAQ, and the SAQ score. Business impact was assessed based on substitutability, strategic importance, and transaction value. This assessment does not constitute a determination that human-rights violations have occurred; it is a screening process for efficiently selecting suppliers for additional SAQs, interviews, on-site assessments, and other follow-up measures.

### D.3.2 Human-rights Risk Assessment and Supplier Prioritisation

Of the 26 issues[104)] assessed, 10 were classified as relatively high risk: occupational health and safety, power harassment, sexual harassment, harassment related to nursing-care leave and similar arrangements, forced labour, discrimination, gender-related human-rights issues, freedom of expression, human-rights issues related to the environment and climate change, and bribery and corruption. In an assessment limited to Japan, six issues were classified as high risk: gender, power harassment, forced labour, discrimination, human-rights issues related to the environment and climate change, and sexual harassment.

In prioritising 3,368 suppliers, seven were classified as Priority 1, 2,673 as Priority 2, six as Priority 3, 348 as Priority 4, and 334 as Priority 5. Approximately 80% of Priority 1 suppliers were in Japan, and approximately half were Japanese manufacturers. Because Priority 2 comprised the majority of suppliers, 274 of those assessed as having a medium impact on the Kanadevia Group's business were identified as candidates for the next stage. Individual company names are not disclosed in this report.

The assessment confirmed the need to set response priorities by combining country-, industry-, and company-specific risks; non-response to or low scores in the SAQ; substitutability; strategic importance; and other factors, rather than managing only the SAQ response rate or average score. At the same time, initial assessments based on external indices and industry information have limitations, and additional investigation is required to confirm individual companies' management systems and actual conditions at operating sites.

Among Kanadevia's transactions, the largest concentration of supplier risk by transaction volume is in Japan, with the manufacturing sector accounting for more than half of the total. In addition, a total of seven cases have been identified as potentially involving Priority 1 supplier risks: manufacturing and wholesale/retail in Japan, and manufacturing in South Korea.

Table D-3-1: Supplier Risk Analysis Results - Priority by Country and Industry

Unit: companies

| Country | Industry | Priority 1 | Priority 2 | Priority 3 | Priority 4 | Priority 5 |
|---|---|---|---|---|---|---|
| Japan | Mining, quarrying and gravel extraction | | 1 | | | |
| | Construction | | 351 | 1 | 76 | |
| | Manufacturing | 4 | 1,632 | 1 | 129 | |
| | Electricity, gas, heat supply and water | | 61 | | 6 | |
| | Information and communications | | | | | 110 |
| | Transport and postal services | | 2 | | 36 | |
| | Wholesale and retail trade | 2 | 542 | 4 | 65 | |
| | Real estate and goods rental/leasing | | 1 | | | 13 |
| | Scientific research, professional and technical services | | 4 | | | 157 |
| | Living-related and personal services and amusement services | | 1 | | | |
| | Medical, healthcare and welfare | | | | | 2 |
| | Compound services | | | | | 1 |
| | Services n.e.c. | | 43 | | 14 | |
| | Unclassifiable industry | | | | | 4 |
| | Total | 6 | 2,638 | 6 | 326 | 287 |
| South Korea | Manufacturing | 1 | 2 | | 12 | |
| | Wholesale and retail trade | | | | | 2 |
| | Total | 1 | 2 | | 12 | 2 |

Unit: companies

| Country | Industry | Priority 1 | Priority 2 | Priority 3 | Priority 4 | Priority 5 |
|---|---|---|---|---|---|---|
| India | Manufacturing | | 6 | | 1 | |
| | Scientific research, professional and technical services | | | | | 1 |
| | Total | | 6 | | 1 | 1 |
| China | Manufacturing | | 13 | | 2 | |
| | Transport and postal services | | | | | 1 |
| | Wholesale and retail trade | | 1 | | 1 | |
| | Total | | 14 | | 3 | 1 |
| Taiwan | Manufacturing | | 1 | | | 6 |
| | Information and communications | | | | | 1 |
| | Total | | 1 | | | 7 |
| Thailand | Construction | | 1 | | | |
| | Manufacturing | | 1 | | | |
| | Wholesale and retail trade | | | | | 1 |
| | Total | | 2 | | | 1 |
| Vietnam | Construction | | | | 1 | |
| | Manufacturing | | 1 | | | |
| | Wholesale and retail trade | | | | | 2 |
| | Total | | 1 | | 1 | 2 |
| Malaysia | Scientific research, professional and technical services | | | | | 1 |

Unit: companies

| Country | Industry | Priority 1 | Priority 2 | Priority 3 | Priority 4 | Priority 5 |
|---|---|---|---|---|---|---|
| Cambodia | Manufacturing | | 1 | | | |
| Singapore | Manufacturing | | 1 | | | |
| | Wholesale and retail trade | | 1 | | | 1 |
| | Total | | 2 | | | 1 |
| United States | Manufacturing | | | | 5 | |
| | Wholesale and retail trade | | | | | 3 |
| | Scientific research, professional and technical services | | | | | 2 |
| | Total | | | | 5 | 5 |
| Italy | Manufacturing | | 3 | | | 6 |
| Germany | Manufacturing | | 2 | | | 11 |
| Austria | Manufacturing | | 1 | | | |
| United Kingdom | Manufacturing | | | | | 1 |
| Netherlands | Manufacturing | | | | | 1 |
| Canada | Manufacturing | | | | | 2 |
| Switzerland | Manufacturing | | | | | 3 |
| Sweden | Manufacturing | | | | | 1 |
| Czech Republic | Manufacturing | | | | | 1 |

### D.3.3 Overview of the Supplier Compliance Survey

The supplier compliance survey was conducted online from April 13 to May 11, 2026. It targeted 557 representatives of the Company's suppliers, and 456 responses were received, for a response rate of 81.9%. The purpose of the survey was to enable the Company and its personnel to review their own trading practices and identify improvements. Questions covered written ordering and acceptance, clarity of order details, reasonableness of prices, delivery dates, and specifications, conduct that could exploit a superior bargaining position, workload, quality requirements, payment and acceptance procedures, legal compliance, confidential information, consultation channels, trust, and satisfaction.

All 41 items rated on a five-point scale were above the passing threshold, and 40 reached the good-performance threshold. Compared with other companies, the percentage of positive responses was higher for 39 of the 41 items, indicating a high overall evaluation by suppliers. For the 14 risk items, the bottom-three response rate - including negative and neutral responses - was below the survey benchmark of 5% for 12 items.

By contrast, two of the 14 risk items - whether the workload associated with transactions with the Company is not significantly higher than for comparable work, and whether delivery dates are not changed unilaterally by the Company - each had a bottom-three response rate of 6.1%, exceeding the benchmark. Free-text responses identified requests for improvement regarding the volume of quotations and specifications, changes to specifications and delivery dates, information sharing between departments, costs for additional work, and points of contact for acceptance procedures. This report does not disclose individual company names or individual comments; it presents only common improvement themes.

### D.3.4 Access to Grievance Mechanisms and Remedy

The average intention-to-use score for the supplier-only Kanadevia Helpline was 4.18, indicating relatively greater room for improvement than for the other assessment items. Reasons for hesitating to use the helpline included uncertainty as to whether an issue was appropriate for consultation (48.8%), concern that consultation could affect transactions with the Company (33.7%), and uncertainty about the process after raising a concern (23.3%).

These results indicate that, in addition to establishing a consultation channel, the Kanadevia Group needs to clearly communicate the types of matters that can be raised, anonymity, prohibition of disadvantageous treatment, post-intake procedures, indicative timelines, and feedback on outcomes. We will also refer to the effectiveness criteria in Principle 31 of the United Nations Guiding Principles on Business and Human Rights and enhance accessibility, predictability, transparency, and dialogue-based operation.

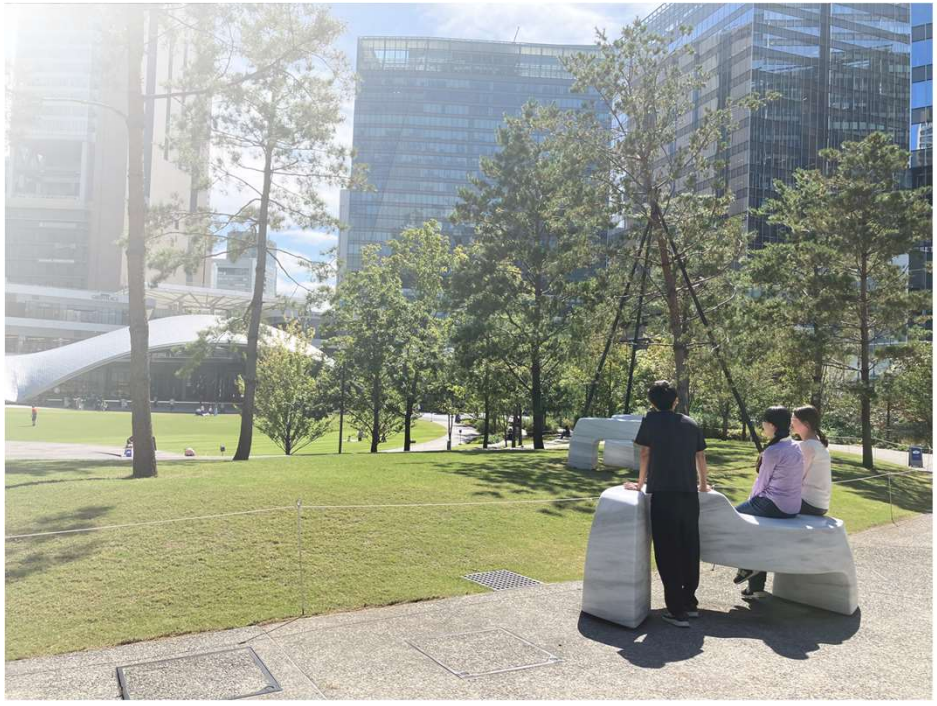
### D.3.5 Next Steps

For human rights due diligence, we will design an additional SAQ and supplier interviews for higher-priority suppliers to examine issues that are difficult to capture through the GCNJ SAQ, including working hours, occupational safety, migrant workers, harassment, and remedy. We will review responses and supporting evidence and, where risks are identified, establish improvement plans, deadlines, follow-up actions, and reassessment.

For trading practices identified through the business partner compliance survey, the Kanadevia Group will consider improvement themes including prior consultation when delivery dates or specifications change, records of the reasons for and approval of changes, treatment of additional costs, standardisation of ordering, quotation and acceptance procedures, clearer inquiry channels, and review of excessive document and meeting requirements.

For the helpline, the Group will improve awareness by including consultation-channel information and dedicated URLs in purchase orders, basic agreements, order acknowledgements, and other documents and through briefings for business partners. It will also explain in an easy-to-understand manner the types of matters that can be raised, anonymity and the prohibition of disadvantageous treatment, and the process followed after a consultation is received.

To operate human rights due diligence on a continuing basis, the Group will clarify the responsibilities and roles of relevant departments and align the Human Rights Policy with procurement-related rules and other internal regulations. It will also develop mechanisms to centrally understand procurement and human-rights information concerning business partners and continuously monitor risk assessments, additional investigations, and improvement status. The Group will also consider expanding the scope to Group companies and second-tier suppliers.



# E. Dialogues and Workshops

# E.1 Considering Urban Development for Resilience Eco Society®



**Dialogue participants (honorifics omitted in the text)**

**Takenaka Corporation**
Katsuhito Ohata, Associate General Manage, Task Force on Space Architecture, Spatial & Structural Engineering Division(online)
Yoshifumi Sakaguchi, Associate General Manager, Smart Community, Engineering Division
Kunio Yanagibashi, Engineering Fellow, Technology Division (online)

**Kanadevia Corporation**
Aiko Tomooka, General Manager, Sustainability Promotion Department
Keiichiro Sonoda, Teppei Nakao, Sustainability Promotion Department
Hideyuki Shinonaga, IR Department

## Redrawing the Boundaries of Circulation

### Future Society and Urban Development Considered through Dialogue with Takenaka Corporation

*Positioning of this dialogue*

*Resilience Eco Society® is not something that can be completed by Kanadevia's technology alone. To realise a society in which people can continue to live safely, securely and prosperously while circulating regional waste, water, energy and resources, the perspectives and capabilities of different actors — architecture, cities, industry, government and local communities — are needed. In this dialogue, Takenaka Corporation and Kanadevia brought together the perspective of creating buildings and cities with the perspective of circulating resources and energy, and explored points of connection towards Resilience Eco Society® in 2050 and questions that need to be considered further.*

**"What are we going to do with waste?"**

This was the question posed by a researcher from the research institute to Yoshifumi Sakaguchi of Takenaka Corporation ("Sakaguchi"), who has long been involved in building-services design and has considered energy saving, gas saving and water saving.

**Sakaguchi**: "I had thought of electricity, gas and water as part of my design scope, but I had thought waste was outside my area. That was the first time I began to think about how far a building could complete things within itself, waste included."

This is a question that reconsiders a building not only in terms of inputs such as electricity, water and goods, but also in terms of outputs including wastewater and waste. At Abeno Harukas, a building with which Sakaguchi was involved over many years, the team considered treating food waste generated by the building inside the building as far as possible, rather than taking it outside. This was an approach of closing the circulation loop within the building.

**Sakaguchi**: "Looking back now, I still think the idea of completing as much as possible inside the building was the right one."

At the same time, it is difficult to complete everything within a building. It is necessary to combine what circulates internally, what is connected to surrounding infrastructure and what is treated at a wide-area level, according to the characteristics of the building and the region.

**Keiichiro Sonoda ("Sonoda")**: "Kanadevia's core business is waste-to-energy plants, but amid population decline and the movement towards local production for local consumption, we are also looking towards decentralised systems. I think the perspective will shift towards smaller-scale systems."

The question is not simply inside or outside the building. It gives rise to the idea of layering circulations of different scales between the building and the city.

**From "Building" and "Demolishing" to "How to Connect the Arterial and Venous Sides"**

Circulation has boundaries not only in space but also in time. The issue raised by Kunio Yanagibashi of Takenaka Corporation ("Yanagibashi") was the mixed waste generated when buildings are demolished.

**Yanagibashi**: "If we want to solve this fundamentally, we have to go back not just to the point of demolition but to the point of construction. We need to use single materials as far as possible and design buildings so that things can be separated later."

**Tomooka**: "So it is important not only to use buildings for a long time, but also to design them from the start so that they are easy to dismantle and easy to use afterwards."

Circulation does not begin after a building is demolished. It begins at the design stage. But if technologies exist to separate and reuse materials, is that alone enough to make circulation work?

**Yanagibashi**: "Even if reuse technologies exist, circulation will not expand without a supply chain that collects recovered materials, stores them and delivers them to places where they can be reused."

There is an "arterial side" that creates buildings and products, and a "venous side" that recovers materials after use. Circulation becomes a continuous flow only when there is a system connecting those who create, those who recover and those who use the materials again.

### A “Minimal DNA” Seen from the Outside

In discussing small-scale, decentralised infrastructure, Sakaguchi put into words how Kanadevia’s technology appears from the outside.

**Sakaguchi**: “I sense something like a minimal DNA in Kanadevia. When building a ship, you define the functions precisely and bring them together within limited space. And it does not end with construction; you also think about subsequent operation and renewal. I feel your company has a distinctive technological philosophy that has been built through continuing to create such things.”

**Tomooka**: “When we interview people inside the company, everyone says that a ship contains everything needed for people to live. If we pursue that idea fully, perhaps we can create something that supports an entire city. I think that sense of pride exists within the company.”

A point of contact has emerged between the technological philosophy accumulated from shipbuilding — bringing together the functions needed in a limited space and operating them over the long term — and future urban development.

### Technology Alone Will Not Move Society

Even if a circular system is technically viable, people will not necessarily accept it and continue to use it.

**Sakaguchi**: “I think the development of systems and technologies, and the redefinition of places, have to be considered as a set.”

To introduce small-scale, decentralised infrastructure into a city, it is necessary to consider not only technology but also institutions, places and people’s acceptance.

**Tomooka**: “The definitions of happiness, of people and of what kind of environment is needed are all things we have collectively given ourselves. If we change that, we can change society as well. I want to think about this together with everyone.”

### We Cannot Envisage 100 Years Ahead without Knowing 100 Years Ago

When considering circular urban development, Sakaguchi introduced words once put to him by a senior colleague.

**Sakaguchi**: “A senior colleague once said to me, ‘How can you think about Tennoji 100 years from now if you do not know what Tennoji was like 100 years ago?’”

Before drawing a future city, we need to know how people have lived in that place and what kinds of culture and memory have accumulated there.

**Sakaguchi**: “It is important first to understand properly the potential that the place originally had. Rather than looking only at the future, we need to think across a long span of time.”

Rather than looking only at the future, we need to understand the past, re-examine present choices and draw the future. Passing on a region’s history and culture to the future is also part of circular urban development.

**Space Appears Beyond Thinking about Circulation on Earth**

Inside and outside a building, the time of making and the time of dismantling, the past and the future. Beyond thinking about circulation on Earth, space appears as a place where things cannot continue to be sent outside.

**Katsuhito Ohata (“Ohata”)**: “At present, astronauts live under severe constraints. But if many people go into space in the future, they will need a quality of life close to life on Earth. Beyond that, I think there may also be a quality of life unique to space.”

In space, air, water, food and energy cannot be carried endlessly from Earth. The circulation of limited resources and the need for people to live with peace of mind and comfort have to be considered together[105)106)].

A perspective of “dual utilisation” was also presented: applying technologies developed for space to special environments on Earth and to the architecture of the future.

**Sonoda**: “At first, space felt like a completely far-fetched topic. But I came to think that considering space also means considering Earth.”

**Nurturing Technologies for the Distant Future, Starting Now**

How can a company continue to nurture technologies such as space architecture, which take a long time to put into practical use? Teppei Nakao (“Nakao”) shared a concern he has felt at Kanadevia.

**Nakao**: “When we try to work on space-related matters at our company, we are sometimes told that profits will only come 10 or 20 years from now, and the activity loses momentum. How have you been able to continue your efforts while drawing a vision for the distant future?”

Takenaka Corporation’s initiatives were not provided with sufficient people or funding from the outset either. They began with a small number of volunteers, and the activities were sustained through proposals within the company and repeated applications for external funding.

**Ohata**: “For me, it was simply that I loved space.”

If work begins only after concrete needs appear, it will not be in time for when it is needed. We should work back from the society of the future and consider what needs to be started now. To draw the future is to decide what actions to take in the present.

**[What Can Be Seen from the Dialogue]**

This dialogue points to six perspectives for considering the future circular society and future urban development.

- The scope of circulation cannot be determined uniformly.
  Circulation within buildings, nearby small-scale decentralised infrastructure and wide-area treatment need to be designed according to regional conditions.
- Circulation begins at the design stage.
  Material selection, ease of separation, recovery, storage and reuse need to be considered as an integrated whole.
- Mechanisms are needed to connect different positions.
  Circulation will not expand unless those who create and those who dispose, the arterial and venous sides, and technologies and institutions are connected.
- Technology alone will not become embedded in society.
  People's acceptance, ways of living, culture and the meaning of place need to be considered.
- The future should be considered within continuity with the past.
  It is necessary to understand the history and uniqueness of each region and to move back and forth between past, present and future.
- Space reflects circulation on Earth.
  An environment in which the inputs and outputs of resources cannot be made ambiguous clarifies the conditions for circulation, resilience and quality of life on Earth.

**[Questions That Remain]**

Through the dialogue, the following questions remained.

- By what criteria should circulation inside buildings, within regions and across wider areas be distinguished?
- How can mechanisms be created to return reused materials and recovered resources to society?
- How can technology, institutions and people's acceptance be changed at the same time?
- Based on a region's history, how can technologies that will be needed in the future be nurtured within present business activities?

These are not specific business plans or matters agreed between the two companies. They are points of connection that became visible through the dialogue and issues that need to be considered further.

### A Rallying “Flag” for People and Technology

Japan is home to many outstanding technologies across a wide range of fields. Yet unless there is a shared sense of purpose about how those technologies should be brought together and what kind of society they are intended to create, they will remain isolated innovations.

The city of the future will require diverse forms of expertise and technology, encompassing architecture, resource circulation, energy, water, institutions and culture. Rather than presenting a perfect blueprint from the outset, what matters first is establishing a clear sense of direction.

The Kanadevia Group's vision of a Resilience Eco Society® is not a completed social system. Rather, it serves as a rallying flag under which people from different backgrounds can come together, bringing their respective technologies and experience to pursue two ambitions simultaneously: “Realize zero environmental impact” and “Maximize people’s well-being.”

The dialogue, which began with the simple question of "What should we do with waste?", moved back and forth between the inside and outside of buildings, between construction and demolition, between the past and the future, and even between Earth and space. The city of the future will gradually take shape through this ongoing process of crossing boundaries and connecting questions, through continued dialogue.







Scenes from the dialogue session with Takenaka Corporation

# E.2 Thinking about the Sustainable Vision in Our Own Words

The Kanadevia Group aims to achieve two goals: “Realize zero environmental impact” and “Maximize people’s well-being.”

But what kind of well-being do we seek to create through our businesses? Whose well-being is it, and in what kind of communities and society will it be experienced?

Our efforts to explore these questions together with people began with the voices we heard internally in response to our TNFD Report.

## Making “Difficulty” the Starting Point for Dialogue

**In 2024**, the Kanadevia Group published **its first TNFD Report**. **In 2025**, it issued an **integrated TCFD/TNFD Report.**







Because we heard within the company that “the content is difficult and hard to fully understand,” we organised internal seminars on TNFD and natural capital, creating opportunities to deepen understanding of the relationship between the environment and our businesses.

As these dialogues continued, understanding of nature and environmental issues gradually expanded. At the same time, a new question emerged: how should we understand the other pillar of our Sustainable Vision, “Maximize people’s well-being”

## What is Well-being, and for Whom?

In FY2025, we held **our first seminar focused on “people & society.”** Participants reflected on what well-being means to them personally and what kinds of value are needed in communities and society, then shared their thoughts with one another. **What emerged was both the richness and the elusiveness of the concept of “well-being.”**

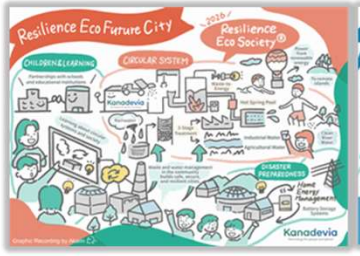
Whose well-being are we talking about? In what kinds of communities does it appear, and in what forms of change? And what can Kanadevia do to support that well-being? The seminar did not produce a single answer. However, through exposure to diverse perspectives, the contours of the next questions we should explore gradually began to take shape.

## Creating a Picture of the Future Across Organisational Boundaries

**To further this discussion, we launched the “Resilience Eco xx Study Group,” a cross-functional initiative to envision the Resilience Eco Society® we hope to realise by 2050.**

People from different generations, departments, and areas of expertise participated in the study group, engaging in dialogue while respecting one another’s ideas. Concepts that began with environmental technologies became connected to diverse perspectives such as daily life, local communities, disaster resilience, and education. As a result, Resilience Eco Society® evolved from an abstract expression of the future into a tangible vision of how people may live in the years ahead. The participants’ discussions were **visualised through graphic recording**. What appeared there was not only environmental technologies and facilities. It also depicted future landscapes beyond technology, including everyday life, local communities, disaster preparedness, social connections, and co-creation.







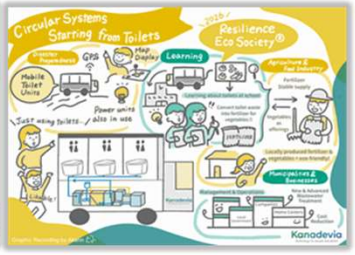









Figure E-1:
Graphic recording and workshop scenes from the “Resilience Eco xx Study Group”.
Top: Future vision drawn from the plenary dialogue.
Middle: Future visions discussed by each team.
Bottom: Team dialogue scenes.

Participants shared comments such as, “I want to expand understanding of Resilience Eco Society® both inside and outside the company,” and “I hope this can develop into a platform for co-creation with local residents.” What these voices have in common is the view that Resilience Eco Society® is not a vision to be completed by Kanadevia alone, but a vision of society that is created and nurtured together with people.

### From Dialogue to the Next Step

Through the internal seminars, participants learned about the Sustainable Vision and shared the question, “What is people’s well-being?” In the workshops, they brought that question together across departmental, generational, and professional boundaries and expressed it as a vision of the future.

At first, the ideas were centered on technologies and functions such as waste treatment, $CO_2$ capture, and resource circulation. Yet the completed concepts became filled with the happiness, connections, and aspirations of people from different communities and generations. In a worldview where the environment is a central theme, how do people feel? How can they achieve well-being? Continuing to think deeply about the people who live within that worldview leads us to new possibilities and new steps forward.

In addition to these seminars and workshops, the Kanadevia Group also operates an internal community. It continuously shares sustainability-related information, insights, and discoveries within the company.

Resilience Eco Society® is not a predetermined answer that is simply communicated throughout the company. It is a vision that begins with each individual’s ideas and takes shape through ongoing dialogue with colleagues and external stakeholders, gradually defining the values we wish to realize and the services and systems that will support them.

The picture created through this initiative will become the starting point for the next dialogue. The questions born from that dialogue will become the seeds of future businesses. Together with diverse people, the Group will continue to envision and shape the future of Resilience Eco Society®.

# F. Third-Party Opinion Report

# F. Third-Party Opinion Report



Sachiko Takami

The Sustainability Collaborative
Senior Advisor

May 2026

I conducted this analysis from a position independent of the Kanadevia Group. The analysis and assessment were performed within the scope of the procedures described below, based on the information obtained through those procedures and the related assertions.

Procedures Performed for the Analysis

* I read Kanadevia Corporation's TCFD/TNFD Integrated Report 2025 and prepared questions to obtain additional information, to which I received responses.

* The analytical method was based on The Natural Step's approach to sustainability analysis. It uses a backcasting method that evaluates current initiatives from the perspective of success in a sustainable society. I analysed and assessed progress using the Four Principles of Sustainability as the criteria.

* The analysis focuses on the Kanadevia Corporation energy business and proposes strategies and measures.

* I referred to the latest information on developments in Japan and internationally concerning Waste to Energy, wind power generation, and CCS.

**Analysis Results**

**Assessment**

In 2024, the Kanadevia Group published a TNFD report focusing on its Waste to Energy business and related activities. In 2025, the Group prepared an integrated TCFD/TNFD report covering all of its businesses. Based on the TCFD and TNFD frameworks, the report evaluates, both quantitatively and qualitatively, the impacts of all the Group’s business activities on the environment, society, and the economy, and sets out strategies and initiatives for sustainable growth.

Under the brand concept 'Taking on the challenge, through the power of technology, to create a world that lives in balance with nature,' the Group divides its businesses into four fields - Environment Business, Machinery Business, Infrastructure Business, and Carbon Neutral Solution Business - and clearly reports the role each plays in contributing to the realisation of a decarbonised society, a resource-circulating society, and a safe and prosperous society. I regard this as a particular strength. I also highly commend the Group for once again analysing a vast amount of materials and data from its global operations, confronting risks sincerely in its reporting, and developing thorough solutions in response.

I consider the Group to have strong potential for future growth. Every country in the world now needs to transition towards a sustainable society, and the Group can provide technologies that address environmental and energy challenges across the broad range of fields required for that transition. What is distinctive is the breadth of technology and know-how that enables the Group to meet needs ranging from developing countries to countries, municipalities, and companies seeking to build advanced infrastructure and systems for a sustainable society. A particular strength of this year's TCFD/TNFD Integrated Report is that, based on The Natural Step's science-based “Four Principles of Sustainability”, the Group has established a Sustainable Vision of realising “Net-zero environmental impacts” and “Maximize people’s well-being”, and has synthesised the desired state through the concept of Resilience Eco Society®, inspired by the Planetary Boundaries framework.

A clear picture of the desired future makes it easier to formulate strategy and clarify both risks and opportunities. I highly commend the Group for backcasting from a clear vision and clearly setting out, in the roadmap towards that vision, which technologies and businesses can be used to achieve its goals.

**A Challenging Global Environment**

However, companies around the world are now facing extremely difficult circumstances. At the time of writing this third-party opinion in April 2026, the war involving the United States and Israel and Iran has led to the closure of the Strait of Hormuz, one of the world's busiest shipping routes. Crude oil prices have surged, significantly affecting the global economy and people's daily lives.

The International Energy Agency (IEA) has expressed serious concern, stating that the disruption in the oil market is more severe than the oil crises of the 1970s and represents the largest supply shock in history. This has once again reminded us of how heavily the world depends on oil and how that dependence creates security and economic risks and is unsustainable.

For that reason, countries around the world must backcast from a vision of a fossil-fuel-free society, change course decisively, and accelerate action immediately. Yet in Sweden, for example, Fossil Free Sweden (Fossilfritt Sverige), a government initiative promoting the industrial transition away from fossil fuels, has indicated that the transition in Swedish industry could be delayed by three to five years. It attributes this to EU countries seeking to slow investment and policy incentives, such as emissions trading, that are needed to accelerate the transition away from fossil fuels, citing unstable global political and economic conditions. I hope the Kanadevia Group will leverage the strategies it has developed in anticipation of transition risks and continue to lead the global market without losing momentum, amid this turbulent global environment.

**Using Sustainability Principles to Avoid Risks**

I believe one of the sources of risk reported in the Kanadevia Group's TCFD/TNFD Integrated Report is that, even when the Group is in a position to offer best-available technologies at every level to improve the global environment, outcomes depend on the extent of customers' knowledge of and commitment to sustainable development. For example, if a municipality planning an offshore wind project and placing an order with the Group does not understand the Four Principles of Sustainability, the project could fail to adequately consider biodiversity or the interests of neighbouring residents and fishers. For the Group, this creates a risk that criticism from local residents or environmental NGOs could prevent not only the Company but also the inherent value of the technology itself from being properly recognised. Offshore wind power, for example, is a technology expected to expand as a sustainable energy source as the world works towards Carbon Neutrality by 2050. If it is not managed in accordance with the Four Principles of Sustainability, however, public acceptance could deteriorate and the technology may not be deployed as widely as expected. This could delay achievement of global Carbon Neutrality by 2050, to the detriment of society as a whole.

It is important to recognise that no product or energy source is inherently sustainable from the outset. The same applies even to renewable energy such as solar and wind power. Energy becomes sustainable only when it is managed in accordance with all four Principles of Sustainability. In particular, the current oil crisis has again highlighted how dependence on oil creates security risks - an issue related to Sustainability Principle 4 - and how unsustainable such dependence can be. After this war ends, rather than simply returning to the previous state, I believe we should call on policymakers to implement measures that enable industry to accelerate the transition away from fossil fuels.

**Proposed Measures Aligned with the Sustainability Principles**

This year, I focus on Waste to Energy and wind power within the Kanadevia Group's energy business and propose measures, ranging from low-hanging-fruit actions to longer-term initiatives, for making these activities sustainable in accordance with The Natural Step's Principles of Sustainability.

**Sustainability Principle 1: In a sustainable society, nature is not subject to systematically increasing concentrations of substances from the earth's crust.**

1. Plastics contained in household waste are derived from petroleum. In parallel with measures to sort waste delivered to Waste to Energy facilities and promote recycling, work with environmental NGOs and municipalities on public-awareness projects that encourage residents to reduce plastic waste.
2. Transition of vehicles used by Kanadevia Group suppliers and the Group's own company fleet to electric vehicles.

**Sustainability Principle 2: In a sustainable society, nature is not subject to systematically increasing concentrations of substances produced by society.**

1. Plastic waste accounts for approximately 50% of $CO_2$ emissions from Waste to Energy facilities. The $CO_2$ capture facility at what is planned to be the United Kingdom's first Waste to Energy facility with carbon capture, scheduled for completion by the Kanadevia Group in 2029, is a measure consistent with Principle 2. Technologies such as CCS, which capture $CO_2$ from exhaust gases and store it in the Earth's crust, should be deployed more widely on a global basis.

**Sustainability Principle 3: In a sustainable society, nature is not subject to systematically increasing degradation by physical means**

1. Before accepting a project, require the customer to conduct a biodiversity risk analysis and assess potential future risks to the Kanadevia Group.
2. Conduct joint research with universities on how offshore wind power can contribute to marine biodiversity, communicate the findings to stakeholders, and engage in dialogue.

**Sustainability Principle 4: In a sustainable society, people are not subject to conditions that systematically undermine their capacity to meet their needs.**

1. It is interesting that proposals for Waste to Energy facilities include using them not only for power generation and heat supply but also as recreational hubs that meet local community needs through products or art made from recycled materials and the addition of gardens. Copenhagen's Waste to Energy cogeneration facility, for example, includes a ski slope that allows residents of the Danish capital to enjoy skiing despite the country's lack of mountains with reliable snow. When designing new facilities, projects that use them as recreational hubs in this way could also be considered.
2. From the perspective of Sustainability Principle 4, offshore wind power should preferably be located approximately 20 km offshore even if doing so doubles the cost. The Kanadevia Group should market its floating offshore wind technology, which can enable such siting, to customers as a more sustainable technology.
3. Establish a consulting function within the Group for environmental technologies and sustainable energy and provide consulting services to customers and the market.

**Summary**

I highly commend this year's TCFD/TNFD Integrated Report covering the Kanadevia Group's entire business portfolio for clearly presenting an overall picture of risks and initiatives relating to climate change and biodiversity. In addition, the responses to my questions showed that the Group has developed robust measures to address these risks and is making thorough efforts to resolve them.

The Group uses The Natural Step's Four Principles of Sustainability to backcast from the desired state and vision of a sustainable society, and has developed an excellent roadmap towards that vision. To enable the Group's broad range of environmental technologies to be deployed around the world more rapidly in line with this strategy, I believe it needs not only technological development but also strategies for collaborating across the value chain and with government at both national and local levels. By collaborating with companies in other industries and a wide range of stakeholders as partners pursuing the same goal of building a sustainable society, the Group can enhance its social standing, reduce the risks identified in the two reports discussed here, and lead to economic growth. Because the Group's growth will in turn contribute to sustainable development worldwide, I have high expectations for the challenges it will take on in the years ahead.

# Closing Remarks

This report brings together climate, nature, and people and society into a single management narrative. It shows where the Kanadevia Group stands today and the direction of its journey towards 2050. It does not present a completed vision. Further work remains in areas such as analysis, indicators, data governance, and initiatives relating to people and society.

At the same time, the Kanadevia Group's businesses in waste management, water, energy, disaster resilience, and infrastructure have the potential to support people's sense of security, enrich life in local communities, and create hope for the future. We believe that an important step towards a Resilience Eco Society® is to view the reduction of environmental impacts and the advancement of human well-being not as separate objectives, but as part of the same vision for society.

We hope that this report will serve as a starting point for conversation. For people of the Kanadevia Group, we hope it will encourage reflection on how their work contributes to addressing societal challenges and inspire discussions with family, friends, local communities, customers, business partners, and other stakeholders. We also hope to deepen dialogue with people in a variety  of positions, including members of the Kanadevia Group, about the future of infrastructure, resource circulation, living in harmony with nature, people and society, and well-being.

By continuing these conversations, we can better understand our respective expectations, concerns, and challenges, and identify better forms of implementation. We hope that this report will be a small step towards creating greater security, joy, and hope in people's lives. The Kanadevia Group will continue to enhance its analysis, implementation, management, and disclosure practices, guided by the insights and feedback gained through this ongoing engagement.

**Aiko Tomooka**

Executive Officer
General Manager of Sustainability Promotion Department
General Manager of ERM Department




**Sustainability Promotion Department Editorial Team**

# Glossary

**1. Transition plan**

An execution plan that organises measures, investment, technology development, organisational capabilities, governance, and metrics and targets over time to move towards future goals and a desired business portfolio. In this report, it integrates Climate, Nature, and People & Society and sets out pathways towards 2030, 2040, and 2050.

**2. Sustainable Vision**

The Kanadevia Group's long-term vision for the state it seeks to achieve by 2050: “Realize zero environmental impact” and “Maximize people’s well-being.” It is the starting point connecting business strategy, the Pillars of Success, the Transition Plan, and metrics and targets with long-term value creation.

Source: Kanadevia - Kanadevia Policy:
https://www.kanadevia.com/english/sustainability/policy/

**3. Net-zero Environmental Impacts (Zero Environmental Impact)**

A Kanadevia Group concept of keeping environmental impacts across the value chain – including the Group’s own activities, upstream supply chains, and customer use of products and services – within the environmental resilience inherently available in the regions where business is conducted.

Source: Kanadevia – Kanadevia Policy:
https://www.kanadevia.com/english/sustainability/policy/

**4. Well-being**

A state in which people are physically, mentally and socially well and can live and work with security while exercising their capabilities. In this report, the concept includes safety, health and engagement of own workforce as well as business contributions to the safety and security of communities and customers, public health and foundations of daily life.

**5. The Four Sustainability Principles**

Four principles presented by the international NGO The Natural Step that focus on the root causes of unsustainability. They treat avoiding systematic increases in substances from the Earth's crust and substances produced by society, avoiding physical degradation of nature, and avoiding structural obstacles to people's basic needs as fundamental conditions for a sustainable society.

Source: Kanadevia - Pillars of Success (Materialities):
https://www.kanadevia.com/english/sustainability/management/initiatives/materiality.html

**6. Environmental resilience**

The ability of the natural environment to maintain or recover its functions and condition even when exposed to external pressures or disturbance. In this report, the concept supports the idea of keeping environmental impacts from business activities within the locally differing capacity of nature to absorb and recover from those impacts.

**7. Resilience Eco Society®**

The future society envisioned by the Kanadevia Group, combining harmony with the environment with resilience in social and economic activities. It seeks to integrate infrastructure for waste, water, energy, disaster prevention and related needs in circular ways, reducing regional environmental impacts while creating social value that enables people to continue living safely and securely.

Source: Kanadevia, TCFD&TNFD Report 2025:
https://www.kanadevia.com/english/ir/data/pdf/tcfdtnfd2025_E.pdf

**8. Value chain**

The full sequence of activities and relationships through which value is created, from raw-material procurement through design and manufacturing, construction, operation and maintenance, use of products and services, and disposal or reuse. The report analyses environmental and social impacts and dependencies across upstream and downstream activities, not only within the Kanadevia Group itself.

**9. TCFD**

Task Force on Climate-related Financial Disclosures. A framework for companies to identify climate-related risks and opportunities and structure financially relevant disclosure under four areas: governance, strategy, risk management, and metrics and targets. It forms the basis for climate disclosure in this report.

Source: IFRS Foundation - TCFD: https://www.ifrs.org/sustainability/tcfd/

**10. TNFD**

Taskforce on Nature-related Financial Disclosures. A framework for identifying dependencies and impacts on nature and the resulting risks and opportunities, and for structuring disclosure around governance, strategy, risk and impact management, and metrics and targets.

Source: TNFD - Recommendations: https://tnfd.global/recommendations/

**11. TISFD Beta Version 0.1**

TISFD stands for Taskforce on Inequality and Social-Related Financial Disclosures. It is a framework under development for connecting impacts, dependencies, risks and opportunities related to people and society with corporate management and disclosure. This report refers to Beta Version 0.1 for a preliminary mapping based on currently available information rather than claiming full alignment.
Source: TISFD - Publications / Framework Beta Version 0.1: https://www.tisfd.org/downloads

**12. Data governance**

A system for consistently managing the scope, ownership, acquisition methods, quality standards, calculation logic, approvals, audit trails, retention and review of non-financial information so that it can be used for management decisions and disclosure. The Kanadevia Group plans to expand this foundation from GHG data to nature- and people- and society-related information in stages.

**13. Regional resilience**

The ability of a community and its infrastructure to maintain critical functions and recover or adapt quickly in the face of disasters, climate change, resource constraints, energy constraints and other external shocks. In this report, it includes strengthening regional foundations by combining water, waste, energy, disaster prevention and related functions.

**14. Biological methanation**

A technology that uses microorganisms to produce methane from hydrogen and $CO_2$. It can make effective use of $CO_2$ in biogas from sewage treatment or anaerobic digestion and convert it into renewable gas, supporting both resource circulation and decarbonisation. Methanation more generally can also produce methane from hydrogen and $CO_2$ through catalytic reactions.

**15. KGI / KPI**

KGI (Key Goal Indicator) measures the final outcome to be achieved, while KPI (Key Performance Indicator) measures activities or progress towards the KGI. In this report, KGIs and KPIs connect 2050 goals with interim targets and measures such as those for 2030 and support progress management of the Transition Plan.

**16.GHG**

A collective term for gases that contribute to global warming when released into the atmosphere. Major greenhouse gases include carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), and fluorinated gases.

**17. Third-party assurance**

A mechanism under which an independent third party reviews the preparation process and evidence for disclosed non-financial information against defined criteria and procedures and provides assurance regarding reliability. A key foundation is a reproducible audit trail that clearly documents data boundaries, calculation methods and approval histories.

**18. Pillars of Success (Materiality)**

The seven priority issues the Kanadevia Group addresses in order to realise the Sustainable Vision. In this report, they serve as a common axis connecting analysis of Climate, Nature, and People & Society with business strategy, risk management, initiatives, KGIs/KPIs, and the Transition Plan.

Source: Kanadevia - Pillars of Success (Materialities):
https://www.kanadevia.com/english/sustainability/management/initiatives/materiality.html

**19. Materiality (financial and impact)**

The approach used to determine which information and issues are important. Financial materiality focuses on how sustainability matters affect corporate value and financial performance, while impact materiality focuses on significant effects of corporate activities on the environment and on people and society. This report uses both perspectives.

**20. Scenario analysis**

A method that considers multiple future states based on different assumptions rather than predicting a single future, and tests the implications for the business environment, risks, opportunities, financial impacts and strategic resilience. This report uses 1.5°C and 4°C climate scenarios and nature scenarios combining physical and transition risks.

**21. Waste to Energy**

Waste to Energy. A system that properly treats waste, such as through incineration, while using the resulting heat for electricity generation or heat supply. In this report, Waste to Energy is a core environmental business combining waste-volume reduction, sanitation, avoidance of landfill, and energy recovery.

**22. Biogas / Biogas power generation**

In the TNFD Report 2024, the Waste to Energy business was divided into “waste incineration power generation” and “biogas power generation (including fuel conversion and hydrogen use),” with biogas power generation positioned as a business promoted mainly by Kanadevia Inova. This report uses the term based on the same classification.
Source: Agency for Natural Resources and Energy, *Japan's Energy 2024*
https://www.enecho.meti.go.jp/en/category/brochures/pdf/japan_energy_2024.pdf

**23. Social acceptance**

A state in which a business, facility or technology is understood, trusted and continuously accepted by stakeholders such as local communities, customers, municipalities, own workforce and business partners. In addition to environmental performance and economics, it is influenced by safety, human rights, dialogue, local benefits, and the fairness of burdens, and can affect orders, operations, continuity and investment decisions.

**24. ERM**

Enterprise Risk Management. An approach for identifying, assessing and managing risks across the organisation rather than in separate departmental silos and connecting them to management strategy and decision-making. In this report, it is the mechanism for linking material climate-, nature-, and people- and society-related risks and opportunities with Group-wide risk management.

**25. EPC**

Engineering, Procurement and Construction. A project model in which plant or infrastructure design, procurement of equipment and materials, and construction are delivered as an integrated scope. In the Kanadevia Group's major businesses, EPC turns customer requirements into facilities and connects equipment delivery with subsequent operation and maintenance.

**26. O&M**

Operation and Maintenance: the operation and upkeep of facilities. It includes operation management, inspections, preventive maintenance, repairs and renewal to maintain performance, safety and environmental standards over the long term. In this report, O&M is an important function in lifecycle businesses that continue to create customer value after EPC.

**27. Waste to X**

Waste to X. A concept and group of businesses that go beyond treating waste or generating energy to convert waste into fuels, gases, chemicals, materials, valuable resources and other forms of value for circular use. It represents the evolution from Waste to Energy towards more advanced resource recovery and circulation.

**28. Lifecycle value**

Value created across the full period of use rather than only at the point of equipment sale, including project development, financing, design, procurement, construction, operation, maintenance, improvement, renewal and resource recovery. It expresses the shift from one-off equipment delivery towards business models that continuously create value with customers and communities.

**29. Affordability**

The condition that customers and communities can bear the cost of a technology or service not only at introduction but across the full lifecycle, including operation, maintenance and renewal, and can continue using it over the long term. This report treats affordability as a commercialisation principle for spreading environmental and social value in practice.

**30. Supply chain**

The network of commercial relationships through which raw materials, components, equipment, services and other inputs are procured and supplied to a company's business activities.

**31. Just social implementation**

An approach to implementing technologies and businesses that help solve climate- and nature-related challenges in forms that customers and communities can continue to use, while respecting the safety and rights of people affected. It emphasises understanding the distribution of benefits and burdens and embedding dialogue, prevention and mitigation, remediation and remedy into business processes.

**32. Group CxO**

A collective term for executive positions with Group-wide responsibility for a specific area of expertise. In this report, Group CxOs connect specialist responsibilities such as compliance and risk governance, legal, and people and organisational culture directly to management decisions and help integrate sustainability issues with business strategy.

**33. Internal control (non-financial information)**

A system of role allocation, checks, approvals, change management and evidence retention designed to ensure that non-financial information is complete, accurate, prepared under appropriate authority and properly retained. It is a foundation for using sustainability information in management and disclosure with reliability closer to financial reporting.

**34. Human rights due diligence (HRDD)**

A continuing process through which a company identifies and assesses actual or potential adverse human-rights impacts arising from its activities and business relationships, prevents or mitigates them, monitors responses, and provides explanation and remediation as needed. In this report, supplier surveys and additional confirmation are used to identify priority issues in the supply chain.

Source: OHCHR - Guiding Principles on Business and Human Rights: https://www.ohchr.org/sites/default/files/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf

**35. LCIA (Life Cycle Impact Assessment)**

Life Cycle Impact Assessment. The stage of LCA that translates resource use, emissions and other inventory results into environmental impacts such as climate change, human health, biodiversity and water resources. This report uses LCIA with procurement data to identify important materials, including impacts beyond GHG emissions.

**36. Carbon Neutrality**

The concept of reducing net greenhouse-gas emissions to zero after accounting for reductions, removals or absorption. In this report, it is used not only for reducing the Kanadevia Group's own emissions but also for considering products, services and transition support that help customers and regions decarbonise as business opportunities.

**37. ESG Databook**

A data publication in which the Kanadevia Group discloses performance data, calculation methods, scopes and other information on environmental, social and governance matters. This report focuses on long-term thinking and strategy, while detailed indicator values, breakdowns and year-on-year trends are supplemented by the ESG Databook.
Source: Kanadevia - ESG Data:
https://www.kanadevia.com/english/ir/data/pdf/esg2026_E.pdf

**38. ISSB / IFRS S1 and S2**

IFRS Sustainability Disclosure Standards developed by the International Sustainability Standards Board (ISSB). IFRS S1 sets general requirements for sustainability-related financial information and IFRS S2 addresses climate-related disclosures. This report mainly refers to the concepts in S2 when structuring climate information.
Source: IFRS Foundation - Supporting materials for IFRS Sustainability Disclosure Standards: https://www.ifrs.org/supporting-implementation/supporting-materials-for-ifrs-sustainability-disclosure-standards/

**39. TNFD general requirements**

General requirements set out by TNFD as premises for nature-related disclosure. In this report, they are referenced when addressing materiality, disclosure scope, time horizons, locations, integration with other sustainability disclosure, and consideration of affected stakeholders.
Source: TNFD - Recommendations: https://tnfd.global/recommendations/

**40. RFP**

Request for Proposal. A document or process through which a customer specifies required functions, performance and conditions and asks prospective providers to submit proposals. In infrastructure businesses, RFPs and related specifications help determine design, procurement, construction and operating conditions and are important for understanding what a contractor can decide directly.

**41. SPC**

Special Purpose Company. A company established for the specific purpose of carrying out a particular business or project. In infrastructure projects, it can clarify project-specific roles for financing, ownership and operation; this report uses the term when explaining contracted-operation models.

**42. Zero human-rights risk**

A target expression used by the Kanadevia Group in its human-rights initiatives. It does not mean that adverse human-rights impacts can never exist; rather, it expresses the objective of continually identifying human-rights risks in business activities and the supply chain and minimizing them as far as possible through prevention, mitigation and remediation.

Source: Kanadevia – Indicators and Targets: https://www.kanadevia.com/english/sustainability/management/initiatives/goals/

**43. GCNJ SAQ**

A sustainability Self-Assessment Questionnaire developed by Global Compact Network Japan for sustainable procurement. It is used to review business partner initiatives across areas including human rights, labour, the environment and fair business practices. In this report, the results help prioritise additional confirmation and dialogue.

Source: Global Compact Network Japan, An Introduction to Sustainable Procurement – Promoting CSR in the Supply Chain – https://www.ungcjn.org/common/frame/plugins/fileUD/download.php?p=elements_file_3624.pdf&t=20250710043028&token=7a5d86a6e5b2c786f1443c32233dd700f4f11d6f&type=contents_files

**44. People Working for the Kanadevia Group (Own Workforce)**

This term corresponds to the concept of “own workforce” used in the TISFD Framework Beta Version 0.1. In addition to employees who have a direct employment relationship with Kanadevia Group companies, the term may include certain non-employee workers who provide labour to the Kanadevia Group, such as individual contractors, workers supplied by employment agencies, and trainees or interns whose work is controlled by the Kanadevia Group. The term describes the conceptual scope of the Group’s own workforce; the actual scope covered by each metric, programme and initiative is determined in accordance with the relevant calculation methodology or applicable criteria.

Reference: TISFD –Publications / TISFD Framework (Beta Version 0.1) (https://www.tisfd.org/downloads)

**45. Human capital**

The knowledge, skills, experience, health, safety, motivation and relationships of own workforce and other people who support the business, viewed as important capital underpinning value creation. This report treats occupational safety, skills transfer, engagement, human rights and organisational culture as factors affecting execution capability and long-term corporate value.

**46. Remedy**

The concept of restoring the rights of people affected by adverse impacts, as far as possible, through actions such as stopping or correcting the impact, restoring the prior condition, or providing compensation. In this report, it includes access to channels for raising grievances or concerns and processes for investigation, correction and follow-up.

**47. Biomass / Biomass power generation**

In the TNFD Report 2024, biomass power generation was identified as one of the businesses analysed in relation to natural capital. At the Miyanosato Biomass Power Plant covered by the analysis, wood chips produced from logs (unused wood) harvested systematically in accordance with forest plans and other arrangements are used as fuel. This report uses the term based on the same classification.
Source: Agency for Natural Resources and Energy, *Japan's Energy 2024*
https://www.enecho.meti.go.jp/en/category/brochures/pdf/japan_energy_2024.pdf

**48. RO (Reverse Osmosis)**

Reverse Osmosis. A membrane-separation technology that applies pressure to water and passes it through a semipermeable membrane to remove salts and dissolved substances. It is used in seawater desalination, brackish-water treatment and purified-water production and is a core technology supporting water treatment in water-scarce regions and for industrial uses.

**49. LCA (Life Cycle Assessment)**

A method for quantitatively evaluating environmental impacts of products and services across their full life cycle, from raw-material extraction through manufacturing, transport and use to disposal and recycling. This report uses LCA to identify materials and processes with large procurement impacts and connect the findings to design improvement and supplier engagement.

**50. Planetary boundaries**

A scientific framework describing a safe operating space for human pressures on the Earth system across nine domains such as climate change, biosphere integrity and freshwater change, with the aim of maintaining Earth-system stability and resilience. This report refers to the concept as background for keeping business-related environmental impacts within regional environmental resilience.

Source: Stockholm Resilience Centre - Planetary boundaries:
https://www.stockholmresilience.org/research/planetary-boundaries.html

**51. Outcome**

The change that occurs in people, society or the environment as a result of an activity. It is distinguished from inputs and outputs such as resources used or the number of activities performed, and focuses on substantive changes such as improved safety, health, skills or regional resilience.

**52. CRGO**

Group Chief Risk Governance Officer. In this report, the CRGO has specialised executive responsibility for Group-wide risk and governance and helps connect climate-, nature-, and people- and society-related issues to management risk and business strategy through bodies including the Sustainability Promotion Committee.

**53. DE&I**

Diversity, Equity & Inclusion. An approach that respects people with diverse attributes, experiences and values, ensures equitable opportunities and support, and creates conditions in which everyone can participate and contribute in organisations and society. This report treats DE&I as one of the management issues related to human capital and people and society.
Source: Kanadevia – Worker's well-being:
https://www.kanadevia.com/english/sustainability/social/employee/

**54. CLO**

Chief Legal Officer, the executive role responsible for legal and compliance matters. In this report, the CLO represents the specialist function that integrates people- and society-related issues such as human rights, compliance, transaction practices and rebuilding trust into governance and business decisions.

**55. Scope 1, 2 and 3**

The GHG Protocol categories for greenhouse-gas emissions. Scope 1 covers direct emissions from sources owned or controlled by the company; Scope 2 covers indirect emissions associated with purchased electricity, heat and similar energy; and Scope 3 covers other indirect value chain emissions such as procurement, transport and use of sold products.

Source: GHG Protocol - Standards & Guidance: https://ghgprotocol.org/standards-guidance

**56. Scope 3 Category 11 calculation note**

For Scope 3 Category 11, 'Use of Sold Products,' use-phase emissions expected over the full assumed lifetime of products sold in a given year are calculated and reported in the Scope 3 emissions of the year of sale. Consequently, annual fluctuations in orders or sales of Waste to Energy facilities can have a large effect on Category 11 emissions reported for that year.

Source: GHG Protocol - Technical Guidance for Calculating Scope 3 Emissions, Category 11:
https://ghgprotocol.org/sites/default/files/standards_supporting/Chapter11.pdf

**57. SSBJ**

Sustainability Standards Board of Japan, the body that develops sustainability disclosure standards in Japan. This report refers particularly to the concepts in SSBJ Theme-based Standard No. 2 for climate-related information.

Source: SSBJ - Sustainability Disclosure Standards: https://www.ssb-j.jp/en/ssbj_standards.html

**58. SBTN**

Science Based Targets Network. An international initiative developing science-based approaches and methods for companies to understand impacts on nature and set and implement targets for areas including freshwater, land, biodiversity and related areas. This report references SBTN with future Freshwater and Land target-setting in mind.

Source: Science Based Targets Network - Corporate Manual:
https://sciencebasedtargetsnetwork.org/companies/take-action/corporate-manual/

**59. CSRD**

Corporate Sustainability Reporting Directive. An EU directive expanding corporate sustainability reporting across a wide range of environmental and social information. In this report, it provides background for considering internal controls and audit-trail management for non-financial data.

Source: European Commission - Corporate sustainability reporting: https://finance.ec.europa.eu/financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

**60. Primary data, estimates and proxy data**

Primary data are measurements or records produced directly by the company or business partners; estimates are values derived using defined calculation methods; and proxy data are substitute values used when necessary actual data are unavailable. Distinguishing these categories and retaining assumptions and calculation bases supports comparability and third-party verification.

**61. ICP (Internal Carbon Pricing)**

A notional or actual carbon price used internally by a company in investment and business decisions. It is a mechanism for incorporating future carbon regulation or emissions costs into management decisions and influencing capital investment, R&D and portfolio choices. This report positions ICP for linkage with ERM and business planning.

Source: Ministry of the Environment, Green Value Chain Platform: https://www.env.go.jp/earth/ondanka/supply_chain/gvc/en/

**62. Carbon pricing**

A general term for mechanisms that assign a price to greenhouse-gas emissions and create an economic incentive for reduction. It includes public-policy mechanisms such as carbon taxes, emissions trading and credit systems as well as internal carbon pricing used by companies in investment and other decisions.

**63. Avoided emissions**

The concept of measuring how much greenhouse-gas emissions are reduced for customers or society compared with a baseline scenario in which a product or service is not introduced. It is separate from a company's Scope 1, 2 and 3 inventory and requires clear disclosure of the calculation boundary, baseline, period and treatment of double counting.

Source: WBCSD, Guidance on Avoided Emissions v2.0: Drive Innovations and Scale Solutions Toward Net Zero https://www.wbcsd.org/resources/guidance-on-avoided-emissions-helping-business-drive-innovations-and-scale-solutions-toward-net-zero/

**64. Nature positive**

The concept of halting the degradation of nature and biodiversity loss and putting nature on a path to recovery. In this report, it includes not only reducing negative impacts on nature but also contributing to the recovery of regional natural capital through water treatment, resource circulation, nature restoration and related activities.

Source: Nature Positive Initiative - What is Nature Positive?: https://www.naturepositive.org/what-is-nature-positive/

**65. CCUS**

Carbon Capture, Utilisation and Storage. A group of approaches that separate and capture $CO_2$ emitted from sources such as power plants, factories and waste-incineration facilities and either use it in fuels, chemicals or other products (CCU) or store it underground or elsewhere (CCS). It supports decarbonisation in sectors where emissions are difficult to eliminate.

**66. Scalability**

The ability to expand a technology or business model across different scales or regions while maintaining quality and economic viability. In this report, scalability emphasises adapting to differences in waste, water demand, natural conditions, institutions and public finances while enabling wider deployment through standardisation and partnerships.

**67. IED**

Industrial Emissions Directive. The EU legal framework for integrated control of emissions to air, water and soil from large industrial facilities and other activities, in which BAT plays an important role in setting permit conditions. This report refers to it as a benchmark for environmental performance at the Casablanca Waste to Energy facility.

Source: European Commission - Industrial and Livestock Rearing Emissions Directive (IED 2.0): https://environment.ec.europa.eu/topics/industrial-emissions-and-safety/industrial-and-livestock-rearing-emissions-directive-ied-20_en

**68. BAT**

Best Available Techniques. Under the IED, this refers to techniques and operating methods that are most effective in preventing or controlling emissions and are technically and economically viable. BAT is documented in sector-specific BAT Reference Documents (BREFs) and is used in this report as a reference for flue-gas and wastewater treatment and for improving environmental performance.

Source: European Commission / JRC - BAT reference documents: https://eippcb.jrc.ec.europa.eu/reference

**69. Transition risk**

Risk arising from the social and economic transition towards decarbonisation, nature-positive outcomes and other sustainability objectives. Drivers can include stronger policies and regulation, technological innovation, changes in markets and customer needs, financing conditions and reputation, potentially reducing demand for existing businesses or increasing investment and procurement costs.

**70. Physical risk**

Risk arising directly from climate change or degradation of natural capital. It includes acute events such as tropical cyclones, floods, storm surges, heat waves and droughts as well as chronic changes such as rising temperatures, water scarcity and ecosystem degradation, which can affect facilities, operations, procurement, logistics and regional infrastructure and ultimately financial performance.

**71. LEAP approach**

The TNFD approach for assessing nature-related issues: Locate interfaces with nature; Evaluate dependencies and impacts; Assess risks and opportunities; and Prepare responses and disclosure. It is the basic process referenced for nature-related analysis in this report.

Source: TNFD - LEAP approach guidance: https://tnfd.global/publication/additional-guidance-on-assessment-of-nature-related-issues-the-leap-approach/

**72. ENCORE**

Exploring Natural Capital Opportunities, Risks and Exposure. An assessment tool for identifying which ecosystem services industries and economic activities may depend on and what pressures or impacts on nature they may generate. It provides foundational information for the natural-capital dependency and impact assessment in this report.

Source: ENCORE - About ENCORE: https://www.encorenature.org/en/about/about-encore

**73. Ecosystem services**

The benefits and functions that ecosystems provide to human life and economic activity. ENCORE classifies them into categories including provisioning services such as food and water, regulating and maintenance services such as climate regulation and water purification, and cultural services. This report uses ecosystem services as a basic unit for assessing business dependencies on nature.

Source: ENCORE - Ecosystem Services: https://encorenature.org/en/data-and-methodology/services

**74. Solid waste remediation**

An ecosystem service in ENCORE. It describes the natural function through which microorganisms, algae, plants, animals and other organisms transform or break down substances contained in organic and inorganic solid waste and mitigate harmful effects. This report uses it when assessing dependencies on nature associated with disposal stages for Waste to Energy facilities and infrastructure.

Source: ENCORE - Solid waste remediation: https://encorenature.org/en/ecosystem_services/11

**75. Voluntary standards**

Standards set and applied at levels stricter than legal requirements. Many Kanadevia factories establish voluntary standards for water quality, air pollutants, and other environmental parameters. At Waste to Energy facilities, municipalities and other procuring authorities often set environmental standards stricter than statutory limits, and contractors are required to supply products capable of complying with those standards.

**76. SAF**

Sustainable Aviation Fuel. Aviation fuel produced from sustainable feedstocks such as used cooking oil, biomass and municipal waste, with the potential to reduce lifecycle greenhouse-gas emissions compared with conventional fossil-based jet fuel. In this report, SAF is an application for waste-derived bioethanol.

**77. PtG**

Power to Gas. An approach that converts electricity, including renewable electricity, into gaseous fuels such as hydrogen or synthetic methane so that energy can be stored, transported and used more easily. It can combine hydrogen production and methanation to move variable renewable energy across time, locations and applications.

**78. Green Innovation Fund**

Japan's Green Innovation Fund programme. Through the New Energy and Industrial Technology Development Organization (NEDO), it provides long-term support from R&D through social implementation for technologies needed to transform the energy and industrial structure towards 2050 Carbon Neutrality. This report refers to support for demonstrations in areas such as hydrogen, wind power and waste combustion.

Source: NEDO - Green Innovation Fund: https://green-innovation.nedo.go.jp/en/about/

**79. KBA (Key Biodiversity Area)**

Key Biodiversity Areas are sites recognised as globally important for the conservation of biodiversity. This report uses KBA data together with protected-area information to understand the proximity of Group sites and customer facilities to rare species and significant ecosystems.

Source: Key Biodiversity Areas - What are KBAs: https://www.keybiodiversityareas.org/en/about-kbas/what-are-kbas

**80. AR3T framework**

A nature-action framework proposed by the Science Based Targets Network (SBTN) based on the mitigation hierarchy. AR3T stands for Avoid, Reduce, Restore & Regenerate, and Transform, and supports prioritising actions to avoid or reduce negative impacts on nature, restore or regenerate affected ecosystems, and transform underlying systems that drive nature loss.

Source: Science Based Targets Network - Act: https://sciencebasedtargetsnetwork.org/companies/take-action/act/

**81. Social vulnerability**

A condition in which people or communities are particularly susceptible to disasters, climate change, economic change or other shocks and have limited resources or choices for recovery. Differences can arise from income, health, living conditions, infrastructure access, employment and information; this report considers the concept when assessing regional risks and just social implementation.

**82. Green electricity / green hydrogen / green ammonia**

“Green” is a designation for electricity, fuels, feedstocks, and similar products whose greenhouse-gas emissions during production and supply are substantially reduced, including through the use of renewable energy. In this report, electricity derived from renewable energy is described as green electricity; hydrogen produced mainly by water electrolysis using that electricity as green hydrogen; and ammonia produced mainly using that hydrogen as green ammonia. Specific requirements vary by scheme and standard.

**83. e-fuel**

A general term for synthetic liquid or gaseous fuels produced by combining renewable hydrogen with captured $CO_2$ or similar carbon sources. They may support decarbonisation while using existing transport and combustion infrastructure; in this report, the term includes options such as e-Methane.

Source: METI Agency for Natural Resources and Energy, *Japan's Energy 2024*
https://www.enecho.meti.go.jp/en/category/brochures/pdf/japan_energy_2024.pdf

**84. e-methane**

Methane synthesised from renewable hydrogen and captured $CO_2$. Because it may be compatible with existing city-gas facilities and transport and storage infrastructure, this report treats it as an important decarbonisation option combining hydrogen production, methanation and $CO_2$ capture.

Source: METI Agency for Natural Resources and Energy, *Japan's Energy 2024*
https://www.enecho.meti.go.jp/en/category/brochures/pdf/japan_energy_2024.pdf

**85. SBT / SBTi**

Science Based Targets initiative (SBTi), an international initiative that assesses whether corporate greenhouse-gas reduction targets are aligned with climate science and supports target setting. This report refers to the possibility of certification in light of the Kanadevia Group's business characteristics.
Source: Science Based Targets initiative - Standards and Guidance:
https://sciencebasedtargets.org/standards-and-guidance

**86. GHG Protocol**

A widely used international standards framework for calculating and reporting greenhouse-gas emissions by companies and organisations. It classifies emissions into Scope 1 direct emissions, Scope 2 indirect emissions from purchased energy, and Scope 3 other value chain emissions.

Source: GHG Protocol - Standards & Guidance: https://ghgprotocol.org/standards-guidance

**87. Number of waste incineration plants in Japan (991)**

According to Japan's Ministry of the Environment, there were 991 municipal-waste incineration facilities as of the end of FY 2024 (March 2025). The Ministry also promotes wider-area integration and consolidation of waste-treatment facilities.
Source: Ministry of the Environment:
https://www.env.go.jp/en/press/press_01569.html
https://www.env.go.jp/en/recycle/smcs/4th-f_Plan.pdf

**88. World Bank Group “What a Waste 3.0”**

A flagship World Bank Group report on global municipal solid waste management published in 2026. Drawing on publicly available data from 217 countries and economies and 262 cities, it presents information on waste generation, composition, collection, treatment and disposal, institutions, costs and financing, and analyses future scenarios through 2050.
Source: World Bank Group - What a Waste 3.0
https://www.worldbank.org/en/publication/what-a-waste

**89. Carbon credit**

A mechanism that quantifies greenhouse-gas emission reductions, absorption or removals under defined rules and treats them as a tradable unit of value. Credits are not a substitute for direct reductions; when used for residual emissions that are difficult to eliminate, the scope, quality and calculation method need to be clear.

**90. UF (Ultrafiltration)**

Ultrafiltration. A membrane technology that uses very fine pores to separate particles, macromolecules, microorganisms and other substances from water. It can generally operate at lower pressure than RO and is used in pretreatment and advanced purification; this report treats it as a membrane technology for desalination, water and wastewater, and industrial-water treatment.

**91. MAP method**

Magnesium Ammonium Phosphate method. A technology that reacts phosphate, ammonium and magnesium in wastewater to recover phosphorus as MAP crystals. The recovered material can be used as a fertiliser resource, connecting phosphorus recovery from sewage treatment with regional resource circulation.

**92. Biochar**

A carbon-rich solid produced by heating biomass such as wood, sludge or agricultural residues under oxygen-limited conditions. It can be used as a soil amendment or fertiliser and can also store biomass-derived carbon for long periods; this report treats it as a technology for recovering value from waste.

**93. Carbon circulation / carbon recycling**

The concept of treating captured $CO_2$ not as waste but as a resource that can be reused as a feedstock for fuels, chemicals, construction materials and other products, thereby circulating carbon. In this report, captured $CO_2$ from Waste to Energy can be used through methanation and related technologies to connect waste treatment with decarbonisation.

Source: METI Agency for Natural Resources and Energy, “Carbon Recycling” to utilize $CO_2$ as a resource
https://www.enecho.meti.go.jp/en/category/special/article/carbon_recycling.html

**94. AOM**

A collective term used in this report for continuing services combining after-sales services, operation management, chemical sales and related activities. Beyond orders for new facilities, it seeks recurring revenues and environmental and social value through improved operating efficiency, life extension, maintenance and renewal of existing facilities, and long-term customer relationships.

**95. Water PPP**

Water Public-Private Partnership. An approach under which public bodies and private companies share roles in financing, developing and operating water infrastructure such as water supply, sewage, wastewater treatment and desalination. This report treats it as a business model that can improve affordability and maintainability.
Source: MLIT, White Paper on Land, Infrastructure, Transport and Tourism in Japan 2025 – English Summary
https://www.mlit.go.jp/hakusyo/mlit/r06/hakusho/r07/data/R7_English%20Summary.pdf

**96. CPO**

Chief People & Culture Officer, the executive role responsible for the people and organisational culture domain. In this report, the CPO is a specialised function that integrates people- and society-related issues—including human capital, organisational culture, engagement, well-being, and the ability of people to exercise their capabilities—into management and business decisions.

**97. Transition Roadmap for the Power Sector**

A sectoral roadmap prepared by Japan's Ministry of Economy, Trade and Industry (METI) that sets out, over time, the direction of technologies and measures supporting the transition to Carbon Neutrality by 2050 in the power sector. It was formulated in February 2022 and updated in November 2025. In this report, it is referenced when considering decarbonisation of thermal power sources to reduce Scope 1 and 2 emissions.

Source: METI - Transition Finance & Roadmaps:
https://www.meti.go.jp/english/policy/energy_environment/transition_finance/index.html
https://www.meti.go.jp/policy/energy_environment/global_warming/transition/transition_roadmap2025_electric_eng.pdf
GX Dashboard - Technology Roadmap for Transition Finance (English overview):
https://dashboard.gx-league.go.jp/en/

**98. SBTN Freshwater / Land**

Areas in which SBTN makes science-based target setting for nature more concrete. Freshwater addresses issues such as water withdrawals and water quality at the watershed level, while Land covers land use and conversion of natural ecosystems. This report references them as a future direction for developing supplier watershed and land-conversion data and setting targets.

Source: Science Based Targets Network - Set targets:
https://sciencebasedtargetsnetwork.org/companies/take-action/set-targets/

**99. Action Plan for Building a Recycled Plastics Market for Automobiles**

An action plan compiled by an industry-government-academia consortium established by Japan's Ministry of the Environment in collaboration with the Ministry of Economy, Trade and Industry to build a market for recycled plastics for automobiles. It sets out initiatives based on collaboration between the manufacturing and recycling sides of the value chain, supply-volume targets, and government support measures. It was compiled in March 2025.

Source: Yohei Kawada, Ministry of the Environment, “Action Plan for Building a Market for Recycled Plastics for Automotive Applications and Expectations for Cellulose/CNF”
https://www.jstage.jst.go.jp/article/shikizai/98/6/98_156/_article/-char/en

**100. AIST-IDEA**

Inventory Database for Environmental Analysis (IDEA), an LCA inventory database developed by Japan's National Institute of Advanced Industrial Science and Technology (AIST). It contains unit data for resource inputs and environmental emissions across a wide range of products and services and is used in this report as the underlying data for estimating procurement impacts.

Source: AIST IDEA Lab: https://riss.aist.go.jp/en-idealab/

**101. LIME3**

A life cycle impact assessment (LCIA) method developed in Japan. It evaluates multiple environmental impacts, including climate change, through effects on areas of protection such as human health, biodiversity, social assets and primary production and enables different impacts to be compared and integrated on a common basis.

Source: LCA Forum Japan - LIME: https://www.lca-forum.org/english/lime/

**102. Pareto analysis**

An analytical method used to visualise whether a large share of the total impact is caused by a relatively small number of major factors and to prioritise improvement. In this report, procurement items are grouped by material category to identify materials that contribute most to climate and other environmental impacts.

**103. 494 companies responding to GCNJ SAQ**

In the initial human rights due diligence conducted in 2026, the assessment used the 2024 GCNJ SAQ responses of 494 business partners. Supplier prioritisation was conducted across 3,368 companies identified in the Kanadevia Group's own data; both figures are based on company-held data.

Source: Global Compact Network Japan, An Introduction to Sustainable Procurement – Promoting CSR in the Supply Chain – https://www.ungcjn.org/common/frame/plugins/fileUD/download.php?p=elements_file_3624.pdf&t=20250710043028&token=7a5d86a6e5b2c786f1443c32233dd700f4f11d6f&type=contents_files

**104. 26 categories of human-rights issues**

The Ministry of Justice publication on business and human rights sets out 26 major categories of human-rights risk that companies should consider. The report's 26 issues were established with reference to that publication and related sources.

Source: MAFF, Guidebook for Respecting Human Rights in the Food Industry — English edition https://www.maff.go.jp/j/shokusan/kokusaihan/attach/pdf/jinkentebiki-13.pdf

**105. Domestic space-industry market size / aerospace as a strategic field**

The Japanese government has set a goal of doubling the domestic space-industry market from JPY4.0 trillion in 2020 to JPY8.0 trillion in the early 2030s. 'Aerospace' is also positioned as one of the strategic fields in Japan's growth strategy.

Source: METI - Space Industry: https://www.meti.go.jp/shingikai/sankoshin/shin_kijiku/pdf/20240607_4.pdf

Source: Cabinet Secretariat - Japan Growth Strategy: https://www.cas.go.jp/jp/seisaku/nipponseichosenryaku/pdf/jgs2026en.pdf

**106. Concept for lunar stays by around 40 people in the 2040s**

JAXA's International Space Exploration Scenario (draft) 2025 and related materials present scenarios looking towards a lunar base or stays involving around 40 people in the 2040s.

Source: JAXA - International Space Exploration Scenario (draft) 2025: https://www.exploration.jaxa.jp/news/detail/005459.html

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