Response to climate change

Our fundamental view

Climate change is an urgent issue shared by the entire world. It poses various threats, including an increase in abnormal weather conditions, adverse effects on ecosystems, and a decrease in water resources. The NOF Group has set the reduction of greenhouse gas emissions as one of the goals of its Responsible Care activities, and has been working on various energy-saving measures. In view of the 2050 Carbon Neutral Declaration announced by the government in October 2020 and its new targets to reduce greenhouse gas emissions announced in April 2021, the NOF Group has decided to set new targets to reduce greenhouse gas emissions. By recognizing the risks and opportunities posed by climate change and promoting countermeasures, the NOF Group will co-create new value with the power of chemistry toward the realization of a prosperous and sustainable society as stated in the NOF VISION 2025.

Support for the TCFD recommendations

In April 2022, the NOF Group announced its support for the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD). Based on the TCFD recommendations, the Group will work to reduce climate-related risks and create opportunities for growth, as well as expand our information disclosure.

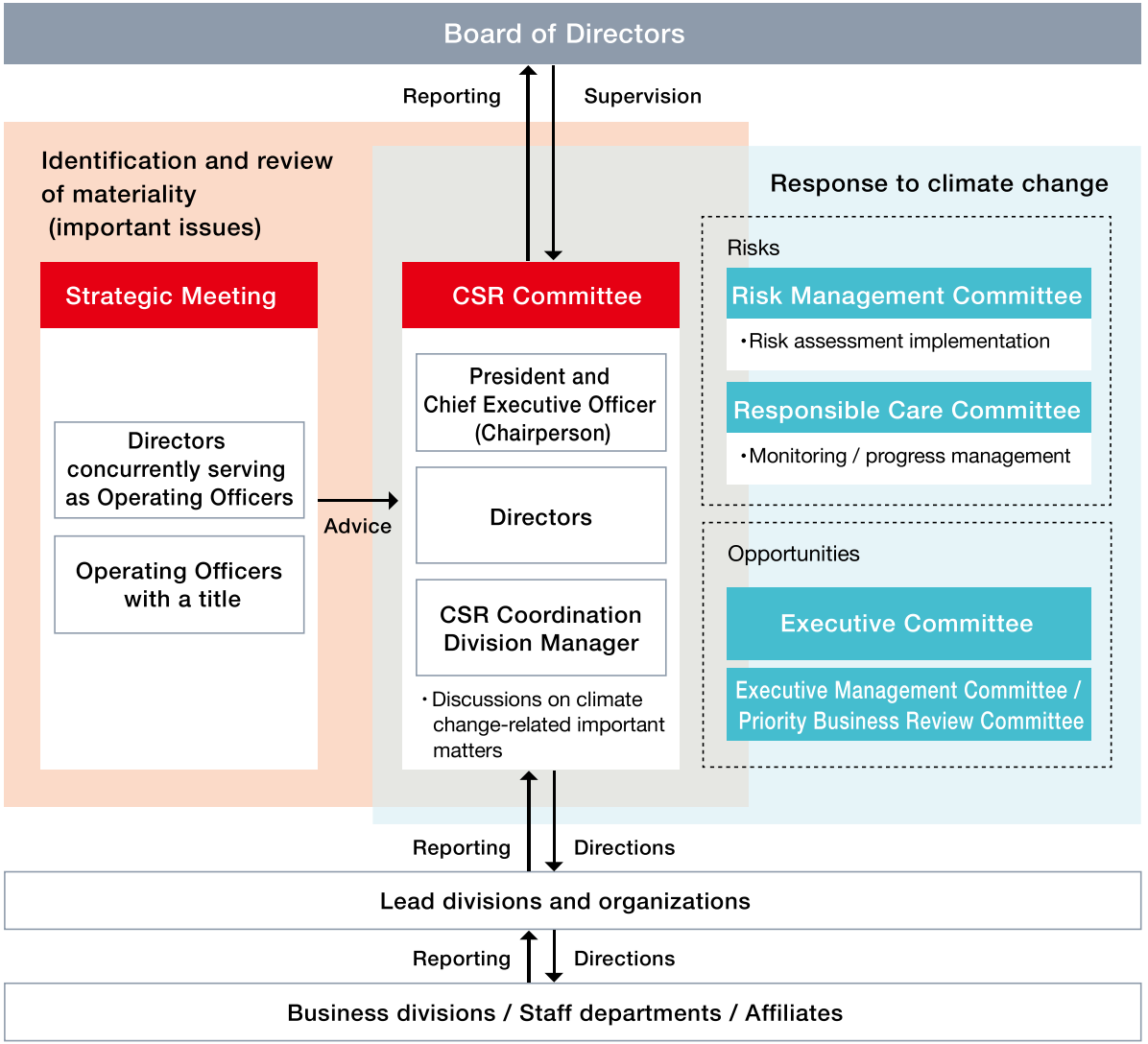
TCFD TASK FORCE ON CLIMATE RELATED FINANCIAL DISCLOSURES

Response to climate change | Disclosure in line with TCFD recommendations: Governance

The NOF Group identifies materiality (important issues) related to sustainability through discussions in the Strategic Meeting, which is composed of Directors concurrently serving as Operating Officers as well as Operating Officers with a title, and the CSR Committee, which is chaired by the President. The Board of Directors then approves the materiality. For each materiality issue, KPIs and target values are set and activities are promoted by the supervising organization or department in charge. The progress and results are reported to the CSR Committee. The CSR Committee reviews materiality with the participation of all directors, and examines key issue items, KPIs, target values, and response policies in order to continuously improve the level of activities.

Response to climate change is identified as one of the materiality issues, and important matters including medium- and long-term targets are discussed at the CSR Committee. In regard to risks, the Risk Management Committee conducts a comprehensive assessment, and the Responsible Care Committee supervises monitoring and managing the progress of risk countermeasures and greenhouse gas emission reduction measures. Opportunities are discussed by the Executive Management Committee and the Priority Business Review Committee, and important matters are deliberated by the Executive Committee. A system has been put in place in which the results of these committees and meetings are reported to the Board of Directors at least twice a year for supervision.

Governance structure for climate change response



Response to climate change | Disclosure in line with TCFD recommendations: Strategy

GRI 201-2

The NOF Group analyzes the risks and opportunities posed by climate change based on the 2°C scenario and 4°C scenario. The key risks and opportunities are as follows.

Category	Scenario	Major risks and opportunities	Overview	Level of impact (2030)	Countermeasures
Transition risks	2°C	Tighter domestic and international regulations	Increased financial burden due to introduction of carbon tax, etc.	Large	・Promotion of measures toward reducing greenhouse gas emissions
		Rise in raw material prices	Sharp rise in prices of raw materials such as petrochemicals and vegetable and animal-based oils due to a decrease in the supply of petroleum, etc. and an increase in demand for biofuels	Large	・Securing stable raw materials through multiple purchases and long-term contracts ・Switching from petrochemical-based raw materials to plant-based raw materials ・Utilization of biomass chemicals ・Carbon recycling (solvent recycling, etc.)
		Changes in the sales destination environment due to the shift to a decarbonized market	Decrease in sales due to decline in market share of gasoline and diesel vehicles	Medium	・Strengthening our response to decarbonized markets, such as electric vehicles and renewable energy
		Deterioration of evaluation/ reputation	Deterioration of evaluation from investors in ESG investment and reputation among customers due to delay in climate change countermeasures	Small	・Active promotion of measures to reduce greenhouse gas emissions and information communication
Physical risks	4°C	Natural disasters such as torrential rains, floods, typhoons, storm surges, etc.	Increased risk of business interruption in production sites and supply chains due to increased torrential rainfall, sea level rise, and storm surges caused by stronger typhoons as a result of climate change	Large	・Rain water countermeasures and disaster prevention measures for buildings and facilities ・Review the business continuity plan (BCP) and conduct education, training, and audits ・Multiple purchases of raw materials
		High temperatures and heat waves	Impact of rising temperatures on refrigeration, air-conditioned storage, etc. in warehouses	Medium	・Ongoing review of capital investment plans
Opportu-nities	2°C	Growing needs for products that contribute to climate change solutions	Expanding needs for products that contribute to climate change mitigation and adaptation (see page 17-19 for details)	Large	・Development and provision of products that contribute to climate change mitigation and adaptation
		Improvement of evaluation and reputation	Improve evaluation from investors in ESG investment and reputation among customers through active climate change countermeasures	Small	・Development and provision of products that contribute to climate change solutions and communication of information on promotion of greenhouse gas reduction, etc.

*2°C scenario: A decarbonization scenario that assumes that necessary measures will be implemented to limit temperature increase to 2°C or less compared to pre-industrial times (International Energy Agency (IEA) "Sustainable Development Scenario (SDS)," etc.)
*4°C scenario: A scenario in which climate change has progressed to the point where the average global temperature has increased by 4°C at the end of the 21st century compared to pre-industrial times (UN Intergovernmental Panel on Climate Change (IPCC) "RCP8.5," etc.)

Response to climate change | Disclosure in line with TCFD recommendations: Strategy

GRI 201-2

Financial impacts (selected)

Steam, electricity, and other forms of energy are consumed mainly in the manufacturing processes of the NOF Group. As transition risks brought about by climate change, the financial burden is expected to increase due to rising carbon tax costs and higher unit prices of renewable energy charges,* and the total impact is estimated to be around 2.4 billion yen. In addition, the NOF Group has established a business continuity plan for physical risks with the 4°C scenario assuming 7.7 billion yen in facilities damage in the event that a typhoon, which occurs once every 500 to several thousand years, breaks through embankments and floods our waterfront plants.

*Charges for promotion of renewable energy generation

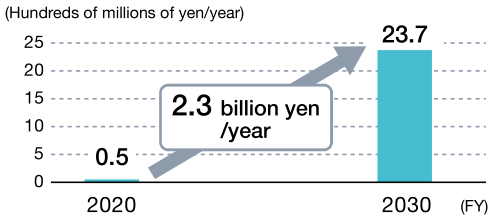
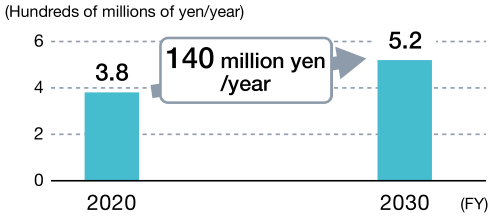
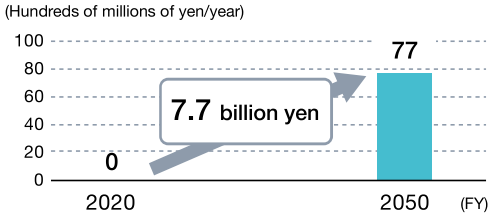
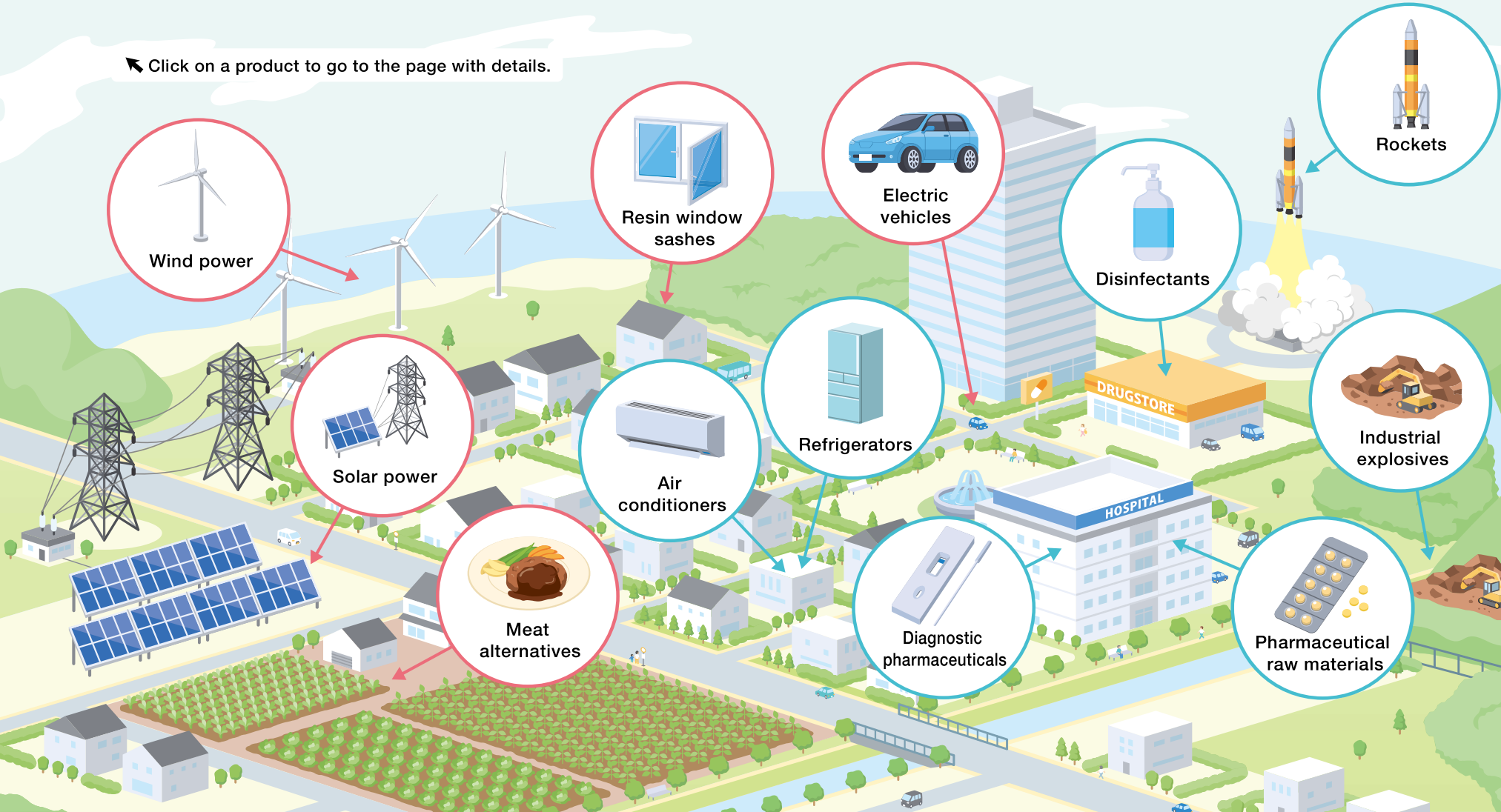
Category	Scenario	Risks	Details of risks	Financial amount of impact	Notes
Transition risks	2°C	Carbon tax	Financial burden from tax increases		CO_2 equivalent emissions in fiscal 2020, with a carbon price of 15,000 yen per ton of CO_2 in fiscal 2030.
		Renewable energy charges	Increased energy costs		The unit price of the renewable energy charge for fiscal 2030 is set at 4.1 yen/kWh based on fiscal 2020 electricity consumption.
Physical risks	4°C	Storm surges	Flooding of facilities due to storm surges		Typhoons and embankment failures every 500 to several thousand years.

Illustration of products that contribute to climate change

Based on the risks and opportunities posed by climate change, the NOF Group will co-create new value with the power of chemistry by working to develop and provide products that contribute to the reduction of greenhouse gases to mitigate the progression of climate change, and products that contribute to adaptation by reducing the impact of climate change.



Response to climate change | Disclosure in line with TCFD recommendations: Strategy

GRI 201-2

Mitigation: 2°C scenario

*Mitigating the progression of climate change by reducing greenhouse gas emissions

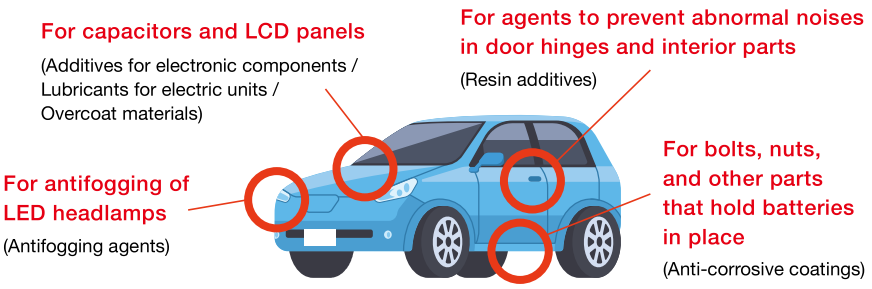
Electric vehicles

Oleo & Speciality Chemicals | Functional Chemicals & Polymers | Anti-corrosion

Market scale: Large

Compared to gasoline-powered vehicles, EVs are expected to cause increased demand for additives for in-vehicle electronic components, lubricants for electric units, anti-corrosive coatings, and overcoat materials for LCD color filters due to the increase in electronic components (passive components), electric units, and screws to hold the components in place, as well as more and larger LCD panels. In addition, because LED lights are effective in reducing power consumption of EVs, demand for antifogging agents for LED headlamps is expected to increase. Furthermore, EVs will make vehicles quieter, which is expected to increase demand for resin additives, such as agents that prevent abnormal noises caused by resins rubbing against each other in interior parts.

End uses of NOF's products



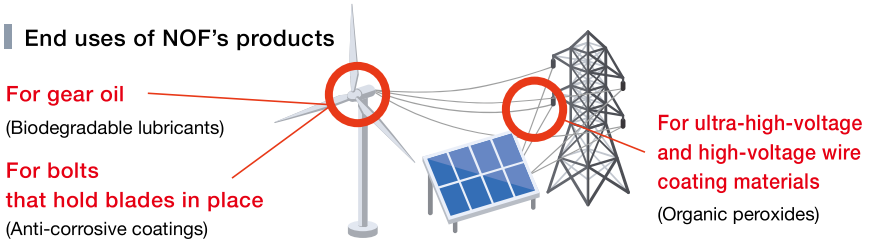
Wind power / Solar power

Oleo & Speciality Chemicals | Functional Chemicals & Polymers | Anti-corrosion

Market scale: Medium

Demand is expected to increase for anti-corrosion coatings for bolts used in wind turbine blades and biodegradable lubricant required for gear lubrication. Demand is also expected to increase for organic peroxides for cross-linked polyethylene, which is used as a coating material for ultra-high-voltage and high-voltage electric wires used to transmit electricity from wind and solar power generation sites.

End uses of NOF's products



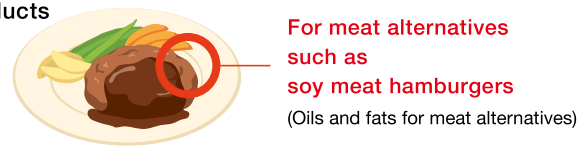
Meat alternatives

Functional Foods

Market scale: Small

Demand is expected to increase for meat alternative oils and fats that help improve the flavor and texture of plant-derived meat alternatives that reduce environmental impact.

End uses of NOF's products



Resin window sashes

Functional Chemicals & Polymers

Market scale: Small

Demand for organic peroxides is expected to increase with the spread of energy-efficient housing because vinyl chloride resin is used in resin window sashes with high thermal insulation properties.

End uses of NOF's products

Response to climate change | Disclosure in line with TCFD recommendations: Strategy

GRI 201-2

Adaptation: 2°C scenario

*Reduction of climate change impacts through disaster prevention, etc.

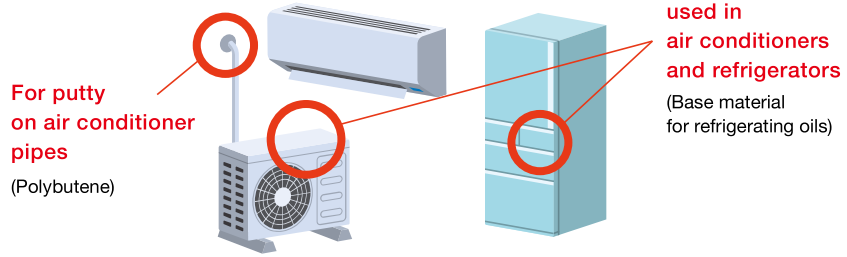
Air conditioners / Refrigerators

Oleo & Speciality Chemicals | Functional Chemicals & Polymers

Market scale: Large

Demand for base material for refrigerating oils, a lubricant for refrigeration equipment, and polybutene for air conditioner putty is expected to increase due to the global increasing need for air conditioners and refrigerators accompanying rising temperatures. The refrigerating machine oil sold by NOF is for alternative CFC refrigerants and contributes to climate change adaptation.

End uses of NOF's products



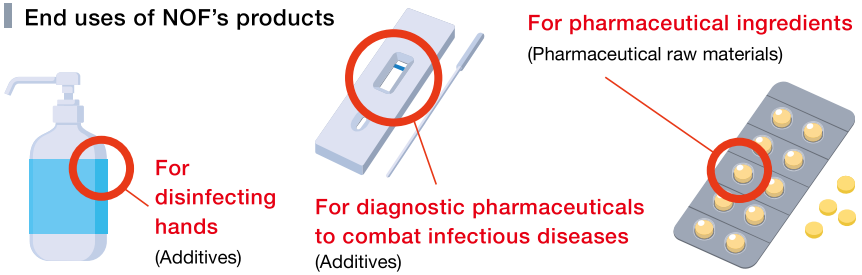
Diagnostic pharmaceuticals / Pharmaceutical raw materials

Life Science Products | DDS Development

Market scale: Large

Due to climate change, there are concerns about the spread of tropical infectious diseases and other diseases and disorders. Therefore, demand for pharmaceutical raw materials is expected to increase due to the rise in disinfectants and additives for diagnostic pharmaceuticals to combat infectious diseases as well as the number of pharmaceutical products against diseases and disorders.

End uses of NOF's products



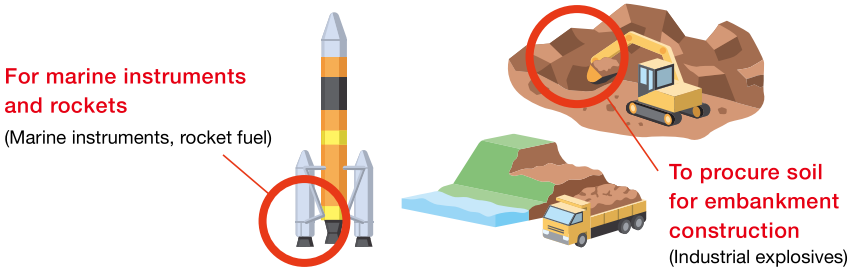
Environmental information / Disaster prevention and mitigation products

Explosives & Propulsion

Market scale: Small

As climate change progresses, the need to survey the entire world, including seawater temperatures, may increase, and the amount of marine instruments, rocket launches, etc., for research may increase. In addition, there may be increased applications for temperature indicator materials (labels, stickers, etc.) for temperature control that change color when a specific temperature is reached. Furthermore, with the increased risk of storm surges and other such conditions, there may be an increase in embankment construction using industrial explosives involving procurement of rocks and soil from mountainous areas.

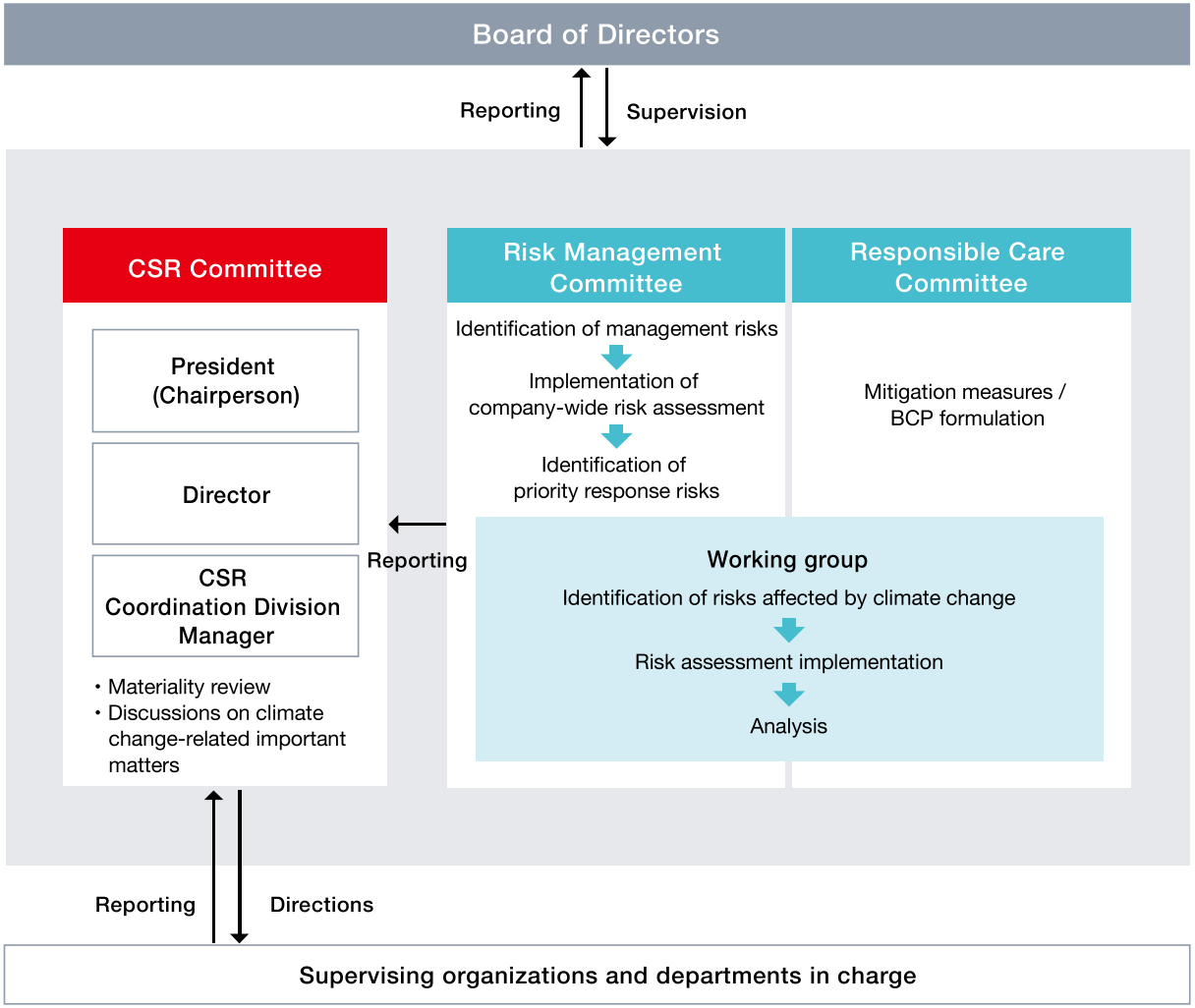
End uses of NOF's products



Response to climate change | Disclosure in line with TCFD recommendations: Risk management

Within the NOF Group, the Risk Management Committee comprehensively identifies various management risks surrounding its business, and conducts company-wide risk assessment on the level of impact and potential for occurrence of each risk item in order to identify risks that need to be addressed as a priority. In disclosing information based on TCFD recommendations, a working group consisting of members selected from the Risk Management Committee and the Responsible Care Committee plays the central role in identifying the risks that climate change will affect among the various management risks surrounding our business, and conducts risk assessments to determine the degree to which the impact will change in the future. The analysis results are reported to the CSR Committee, and important decisions are made related to climate change risk countermeasures.

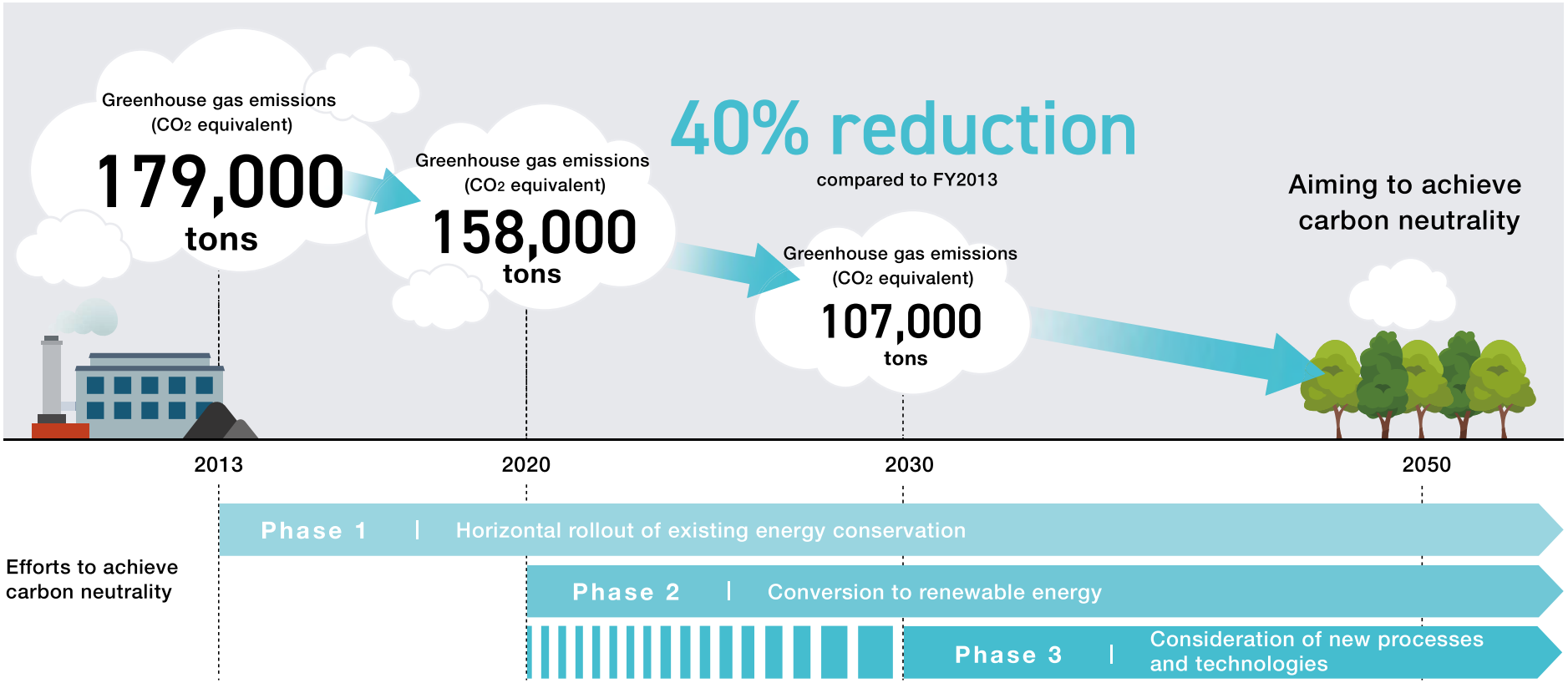
Climate change-related risk management organization diagram



Roadmap toward reducing greenhouse gas emissions

The NOF Group has created a roadmap toward reducing greenhouse gas emissions and is working to mitigate climate change in its business activities. Considering the possibility of an increase in emissions due to business expansion, the Group will aim for carbon neutrality in 2050 by introducing renewable energy as the new Phase 2 and starting to consider new processes and technologies as Phase 3, while also reducing the financial burden associated with transition risks.

Reduction of GHG (CO_2 equivalent) generated by our business activities [Scope 1, 2]



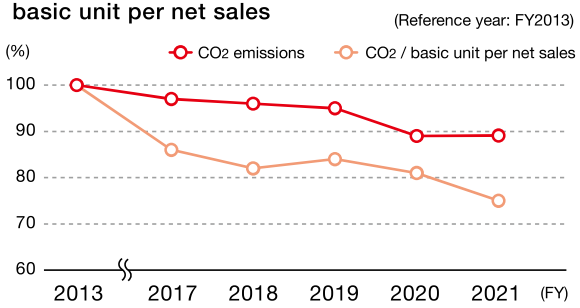
Response to climate change | Disclosure in line with TCFD recommendations: Metrics and targets

GRI 305-1, 305-2, 305-3

GHG emission volume

In view of the 2050 Carbon Neutral Declaration announced by the government in October 2020 and its new targets to reduce greenhouse gas emissions announced in April 2021, the NOF Group set a new target of reducing CO_2 emissions by 40% by fiscal 2030 compared to fiscal 2013. The Group had already reduced CO_2 emissions / basic unit per net sales by about 25% (compared to fiscal 2013) in fiscal 2021, and is aiming to reduce greenhouse gas emissions and achieve carbon neutrality by 2050.

Results of CO_2 emissions and basic unit per net sales



Scope 1, 2 CO_2 emissions (FY2021)

(Thousand tons of CO_2)

	Scope 1	Scope 2	Total (Scope 1+2)
NOF	49.1	97.3	146.4
The NOF Group	55.6	103.6	159.2

Scope 3 CO_2 emissions (FY2021)

(Thousand tons of CO_2)

Category	FY2021	Calculating method
Purchased products and services	Not determined	—
Capital goods	12.3	Calculated by multiplying acquisition cost of fixed assets by CO_2 emission per product in guidelines, etc.
Fuels and energy-related activities not included in Scope 1 or 2	38.2	Calculated by multiplying the sum of electricity consumption and steam consumption by CO_2 emission per product in guidelines, etc.
Transportation and distribution (upstream)	Not determined	—
Waste generated in business activities	0.03	Calculated by multiplying the weight of each type of waste generated in production sites by CO_2 emission per product in guidelines, etc.
Business travel	0.2	Calculated by multiplying the number of employees by CO_2 emission per product in guidelines, etc.
Employee commuting	0.6	Calculated by multiplying the amount of commuting expenses by CO_2 emission per product in guidelines, etc.
Leased assets (upstream)	—	Not applicable
Transportation and distribution (downstream)	8.9	Calculated by the ton-kilometer method
Processing of sold products	Not determined	—
Use of sold products	Not determined	—
End-of-life treatment of sold products	Not determined	—
Leased assets (downstream)	—	Not applicable
Franchises	—	Not applicable
Investments	—	Not applicable
Total	60.2	

Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain (issued by the Ministry of the Environment and the Ministry of Economy, Trade and Industry) was used for calculation.