










[Scenario analysis]

We conducted scenario analyses of Energy, Metal Recycling, Food Products, and Lumber businesses, and identified risks and opportunities by identifying the factors of climate change that are considered important in each business.

Scenario	Business	Climate change factor	Assumption	Opportunities/risks and impacts		
Transition scenario	Energy 	Policies, laws and regulations	Reinforcement of environmental regulations	<ul style="list-style-type: none"> Regulations on GHG emissions will lead to fuel conversion. The use of renewable energy will become more mandatory. 	Opportunity	
			Carbon pricing (carbon tax, etc.)	<ul style="list-style-type: none"> GHG emissions will be taxed. The introduction of an emissions trading system will increase costs imposed at the time of credit purchase and others. 	<ul style="list-style-type: none"> Increase in revenue opportunities in line with increases in demand for PKS, RPF and other fossil fuel alternatives and new products (impact: large) 	
		Technology	Development and widespread use of next-generation technology	<ul style="list-style-type: none"> Demand for gasoline will decline due to the widespread use of electric vehicles. The market of oil products will be smaller as carbon tax becomes more common. 	Risk	
			Market	Change in energy	<ul style="list-style-type: none"> Renewable energy will be introduced further. Distributed energy systems will be developed and widespread. 	<ul style="list-style-type: none"> Decrease in revenue opportunities in line with a decrease in demand for fossil fuel (impact: medium)
	Modal shift	<ul style="list-style-type: none"> There will be more demand for vessel fuel. 				
	Metal Recycling 	Policies, laws and regulations	Reinforcement of environmental regulations	<ul style="list-style-type: none"> The use of alternative and renewable materials will become more mandatory. There will be more demand for switches from other materials. 	Opportunity	
			Technology	Development and widespread use of next-generation technology	<ul style="list-style-type: none"> Demand for batteries and relevant materials will increase due to the transition to hydrogen society and widespread use of electric vehicles, leading to more demand as vehicles become lighter. There will be more use of recycled materials and manufacturing yield due to the integration of alloys. 	<ul style="list-style-type: none"> Increase in revenue opportunities in line with an increase in demand for aluminum which is a light material and highly recyclable (impact: large) Increase in revenue opportunities in line with an increase in demand for copper which is required in batteries and whose recycled material can be provided (impact: large)
		Market	More environmental awareness	<ul style="list-style-type: none"> Demand for aluminum scrap will increase due to the reassessment of aluminum's recyclability. 	Risk	
			Change in energy	<ul style="list-style-type: none"> There will be more energy shifts in countries refining aluminum ingots. The market of services related to ZEB/ZEH and renewable energy will be formed. 	<ul style="list-style-type: none"> Decrease in revenue opportunities in line with a decrease in demand for aluminum parts that are used in internal combustion vehicles (impact: medium) 	
	Food Products 	Policies, laws and regulations	Carbon tax	<ul style="list-style-type: none"> Cost of raw materials and energy will increase. 	Opportunity	
			Environmental regulations	<ul style="list-style-type: none"> Investment costs for non-fluorocarbon refrigerators and freezers will increase. 	<ul style="list-style-type: none"> Increase in revenue opportunities in line with an increase in demand for environment-friendly products (impact: large) Increase in revenue opportunities by creating new businesses through the use of next-generation technologies and collaboration with different industries (impact: medium to large) 	
		Technology	Development and widespread use of next-generation technology	<ul style="list-style-type: none"> Transition to agriculture technology and smart aquaculture will occur. Development of renewable materials and biomass-related technology will progress. 	Risk	
			Market	Changes in consumer behavior and awareness	<ul style="list-style-type: none"> Interest in environment-friendly consumption will increase. Interest in disaster prevention measures will increase. Health demand will increase. 	<ul style="list-style-type: none"> Increase in procurement costs of fishery and livestock raw materials and products due to imposition of carbon tax and environmental measures (impact: large)
				Change in energy	<ul style="list-style-type: none"> Changes in demand for fossil fuels will increase the cost of cold storage materials, etc. 	<ul style="list-style-type: none"> Decrease in revenue opportunities in line with a decrease in demand for natural resources (impact: large)
			Changes in business models	<ul style="list-style-type: none"> Business models will change to sharing and upcycling. Joint delivery, modal shift, and other initiatives will progress. 		
	Lumber 	Policies, laws and regulations	Carbon tax	<ul style="list-style-type: none"> Cost of raw materials and energy will increase. 	Opportunity	
			Environmental regulations and policies	<ul style="list-style-type: none"> Insulation and energy conservation standards for housing and other buildings will be raised. ZEB and ZEH will become mandatory. Policies related to forest protection and carbon sinks will be implemented. 	<ul style="list-style-type: none"> Increase in revenue opportunities in line with an increase in demand for lumber in housing and other construction (impact: large) Increase in revenue opportunities in line with an expansion of wood fuel market (impact: large) 	
		Market	Changes in consumer behavior and awareness	<ul style="list-style-type: none"> Interest in environment-friendly consumption will increase. The demand structure will change as preferences change from owning to sharing and preferences for housing. 	Risk	
			Change in energy	<ul style="list-style-type: none"> The use of non-fossil energy sources will expand (and the use of fossil fuels will shrink). 	<ul style="list-style-type: none"> Procurement costs associated with imposition of carbon tax and environmental measures (impact: large) 	
			Other market changes and the impact of technological innovation and its spread	<ul style="list-style-type: none"> It will be possible to generate carbon credits from forest absorption. The ZEB and ZEH markets will expand. Demand for housing and other buildings prepared to respond to weather disasters will increase. Demand will increase and processes will shift toward low-carbon materials, such as wood that can fix CO₂. Demand for environment-friendly products (FSC products, plastic-free products, etc.) will increase. 		
Common to the entire Company 	Policies, laws and regulations	Carbon pricing (carbon tax, etc.)	<ul style="list-style-type: none"> Costs will increase in the entire market as carbon tax becomes more common. 	Risk		
		Change in energy	<ul style="list-style-type: none"> There will be an excessive increase in demand for renewable energy. 	<ul style="list-style-type: none"> Increase in taxes such as carbon tax (impact: medium) Increase in costs in line with soaring electricity and material prices (impact: medium) 		

Scenario	Business	Climate change factor	Assumption	Opportunities/risks and impacts	
Current scenario	Metal Recycling 	Rise in average temperature	·There will be more demand for soft drinks and beer.	Opportunity ·Increase in revenue opportunities in line with an increase in demand for aluminum cans (impact: medium)	
		Food Products 	Rise in sea level	·Farms, processing plants, and aquaculture ponds in low-lying areas will have difficulty operating.	Opportunity ·Increase in revenue opportunities due to handling of new marine resources (impact: medium)
	Rise in average temperature		·Growing conditions of raw materials will change and productivity will decrease. ·Logistics costs for food products will increase.	Risk ·Increase in procurement and storage costs for marine and livestock raw materials and products due to changes in the production and logistics environment (impact: large)	
	Changes in weather patterns		·Demand for frozen and processed foods will increase. ·Water stress will increase. ·Harvests of agricultural, livestock, and fishery products will decrease and quality will decline. ·Distribution of commercial products will decrease, making it difficult to procure sufficient supplies.		
	Lumber 	Physics	Intensification of abnormal weather	·Increased probability of supply chain disruptions due to damage to road, rail, and port facilities ·Landslides and fallen trees in forests will increase.	Opportunity ·Increase in revenue opportunities in line with an increase in demand for strengthening facilities and infrastructure in preparation for disasters and increase in demand for relocations from disaster-prone areas (impact: large)
			Rise in sea level	·Demand for capital investment and relocation in flood risk areas will increase.	
			Rise in temperature	·Plant growth conditions will change. ·Fires, tree pests, etc. will occur in forests.	
			Combined chronic impacts	·Vegetation and timber procurement areas will change, including deterioration of tree growing conditions. ·Frequency of pests and diseases will change. ·It will be difficult to maintain quality. ·There will be more demand for insulation and shielding effects.	Risk ·Increase in costs associated with supply chain restructuring (impact: medium)
	Common to the entire Company 		Rise in sea level	·There will be more risks of lowered port functions and storm surges (whose impact will not last in the medium term).	Risk ·Generation of costs for capital investment for measures against global warming, storm surge and others (impact: medium) ·Increase in costs in line with an increase in electricity use and soaring transportation insurance premium (impact: medium)
			Increase of abnormal weather	·There will be more risk of disasters such as typhoons. ·Transportation insurance premiums will increase.	·Generation of costs to repair disrupted logistics network and opportunity cost (impact: medium)
Rise in average temperature			·There will be more risk of workplace accidents when conducting operations outdoors. ·Further capital investment will be required for air conditioners, etc.		

About scenario analysis

[Selecting a scenario]






In order to assess the change in the business environment in an objective manner, we carried out an analysis mainly in reference to scenarios presented in World Energy Outlook 2021 and Net Zero by 2050 of IEA (International Energy Agency) and Fifth Assessment Report and Special Report on Global Warming of 1.5° C of IPCC (Intergovernmental Panel on Climate Change).

Scenario classification	Referred scenario name	Details	Temperature rise at the end of this century
Transition scenario	IEA SDS [Sustainable Development Scenario]	Sustainable growth scenario to be able to achieve SDGs that covers the 2°C goal in the Paris Agreement in reference to IEA World Energy Outlook 2021 and other documents	+1.7°C
	IEA NZE [Net Zero Emission Scenario]	Scenario indicating how demand for energy and energy mix should change for the world to achieve net zero emissions by 2050 and limit the temperature rise to within 1.5°C in reference to IEA Net Zero by 2050	+1.5°C
	IPCC RCP 2.6/1.9 [Representative Concentration Pathways]	Scenario with low emissions developed with the target of limiting the future temperature rise to 2°C or lower in reference to IPCC Fifth Assessment Report and Special Report on Global Warming of 1.5°C	+1.6°C/ +1.5°C
Current scenario	IEA STEPS [Stated Policies Scenario]	Scenario reflecting the countries' current policies and targets in reference to IEA World Energy Outlook 2021, Net Zero by 2050 and other documents	+2.6°C
	IPCC RCP 8.5/6.0/4.5 [Representative Concentration Pathways]	Scenario stating that the world's average temperature will rise by roughly 4°C at the end of the 21st century compared to before the Industrial Revolution in reference to IPCC Fifth Assessment Report	+4.3°C/ +2.8°C/ +2.4°C

[Response policy]

We promote the following response to identified risks and opportunities.

We will recognize and analyze risks and opportunities further and enhance responses to increase opportunities and reduce risks.

Business	Opportunity	Risk
 <p>Energy</p>	<p>· Increase in revenue opportunities in line with increases in demand for PKS, RPF and other fossil fuel alternatives and new products</p> <p>< Response policy ></p> <ul style="list-style-type: none"> · Promotion of waste tire recycling business · Promotion of waste plastic and RPF business · Promotion of PKS and wooden pellet business · Promotion of vessel biofuel business · Promotion of carbonized biomass business <ul style="list-style-type: none"> · Promotion of ESCO business · Promotion of construction waste material business · Promotion of ammonia business · Participation in the carbon credit market · Others (promotion of business using M&A and others) 	<p>· Decrease in revenue opportunities in line with a decrease in demand for fossil fuel</p> <p>< Response policy ></p> <ul style="list-style-type: none"> · Active promotion of sales of alternatives · Promotion of business in which selling, general and administrative expenses are reduced through streamlining of operation
 <p>Metal Recycling</p>	<p>· Increase in revenue opportunities in line with an increase in demand for aluminum which is a light material and highly recyclable</p> <p>· Increase in revenue opportunities in line with an increase in demand for copper which is required in batteries and whose recycled material can be provided</p> <p>· Increase in revenue opportunities in line with an increase in demand for aluminum cans</p> <p>< Response policy ></p> <ul style="list-style-type: none"> · Promotion of strengthening of the ability to procure scrap · Further understanding of customers' needs and promotion of a stable supply of scrap <ul style="list-style-type: none"> · Promotion of inter-departmental collaboration and sharing of existing facilities · Enhancement of recycling facilities and promotion of strengthening of their functions 	<p>· Decrease in revenue opportunities in line with a decrease in demand for aluminum parts that are used in internal combustion vehicles</p> <p>< Response policy ></p> <ul style="list-style-type: none"> · Shift to materials for electric vehicles in collaboration with customers
 <p>Food Products</p>	<p>· Increase in revenue opportunities in line with an increase in demand for environment-friendly products</p> <p>· Increase in revenue opportunities by creating new businesses through the use of next-generation technologies and collaboration with different industries</p> <p>· Increase in revenue opportunities due to handling of new marine resources</p> <p>< Response policy ></p> <ul style="list-style-type: none"> · Promotion of vertically integrated business · Promotion of raw material origin processing · Promotion of onshore aquaculture business <ul style="list-style-type: none"> · Promotion of microalgae business · Promotion of food tech 	<p>· Increase in costs related to procurement and storage of fishery and livestock raw materials and products</p> <p>· Decrease in revenue opportunities in line with a decrease in demand for natural resources</p> <p>< Response policy ></p> <ul style="list-style-type: none"> · Secure multiple procurement routes · Promotion of frozen foods and development of new marine resources
 <p>Lumber</p>	<p>· Increase in revenue opportunities in line with an increase in demand for lumber in the housing market</p> <p>· Increase in revenue opportunities in line with an expansion of wood fuel market</p> <p>· Increase in revenue opportunities in line with an increase in demand for strengthening facilities and infrastructure in preparation for disasters and increase in demand for relocations from disaster-prone areas</p> <p>< Response policy ></p> <ul style="list-style-type: none"> · Expansion of immediate delivery, small-lot and processing functions and product development for housing and other buildings in cooperation with the Steel Business · Securing production of wood structural materials from raw materials and product development · Creation and acquisition of carbon credits 	<p>· Increase in procurement costs for logs, lumber products, etc. due to imposition of carbon tax and environmental measures</p> <p>· Increase in costs associated with supply chain restructuring</p> <p>< Response policy ></p> <ul style="list-style-type: none"> · Strengthen procurement capabilities of domestic and overseas raw materials with a view to M&A and build a competitive supply chain · Securing suppliers including forest acquisition and forest management
<p>Common to the entire Company</p> 	<p>Company-wide opportunities realized in each business</p>	<p>· Increase in taxes such as carbon tax</p> <p>· Increase in costs in line with soaring electricity and material prices</p> <p>· Increase in costs in line with an increase in electricity use and soaring transportation insurance premium</p> <p>· Generation of costs for capital investment for measures against global warming, storm surge and others</p> <p>· Generation of costs to repair disrupted logistics network and opportunity cost</p> <p>< Response policy ></p> <ul style="list-style-type: none"> · Promotion of reduction of GHG emissions · Promotion of energy saving · Promotion of periodic review of insurance, etc. · Promotion of measures for buildings against flooding and storms · Identification of products with high procurement risk in the case of disasters and promotion of risk distribution