

Moriroku Group - Analysis of risks/opportunities related to climate change (as of November 2022)

Time frames: 4-10 years (by 2030) for medium-term, 11-25 years (by 2050) for long-term



Risk category			Business impact			Financial impact	
Category	Subcategory	Sub-subcategory	Time frame	Risks	Opportunities	Evaluation: Risks	Evaluation: Opportunities
Transition risks (Analysis based on 1.5-2°C scenario)	Policies and regulations	Carbon pricing (carbon tax) emissions trading	Medium-to long-term	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Cost of tax burden if carbon taxes are implemented</li> <li>● Costs incurred if the scope of carbon emissions trading is expanded</li> </ul>		Major	-
		Plastics regulations	Medium-to long-term	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Recycling regulations prohibiting the use of certain materials, or making them subject to management</li> </ul> <p><b>Moriroku Technology</b></p> <ul style="list-style-type: none"> <li>● Decrease in revenue due to lower demand for plastic products when the use of plastics in automobiles, etc., is regulated</li> <li>● Increase in costs due to switch from petroleum-derived plastics to alternative materials such as biomass plastics</li> </ul> <p><b>Moriroku Chemicals</b></p> <ul style="list-style-type: none"> <li>● Decrease in revenue due to lower sales of resin-related products if plastic use is regulated</li> </ul>	<p><b>Moriroku Technology</b></p> <ul style="list-style-type: none"> <li>● Increase in competitiveness due to the development of new parts, etc., through the technological development of materials that could serve as alternatives to plastic</li> <li>● More efficient manufacturing processes due to the use of recycling within plants</li> </ul> <p><b>Moriroku Chemicals</b></p> <ul style="list-style-type: none"> <li>● Increase in sales due to the expansions in the sales of new materials such as biomass plastics</li> <li>● Expansion in opportunities for recycling businesses</li> <li>● Increase in value chain revenue through the provision of chemical solutions</li> </ul>	Major	Major
	Technology	Advancements in low-carbon technologies	Medium-to long-term	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Decrease in demand for existing products and services due to the replacement of such products and services with low-carbon products and services</li> <li>● Increase in costs due to the development of technologies, the use of new technologies, upfront investment in facilities, etc., in shifting to low-carbon products and services</li> </ul>	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Increase in demand and revenue for environmentally friendly products and materials based on Moriroku Technology and Moriroku Chemicals working together to develop biomass plastic materials</li> </ul> <p><b>Moriroku Technology</b></p> <ul style="list-style-type: none"> <li>● Increase in revenue due to rising demand for low-carbon products caused by the development and deployment of low-carbon products</li> <li>● Expansion in business opportunities and increase in revenue due to advancements in and widespread use of EV technologies</li> <li>● Increase in energy efficiency and decrease in operating costs for production processes and production itself, due to the development of low-carbon emission equipment</li> </ul> <p><b>Moriroku Chemicals</b></p> <ul style="list-style-type: none"> <li>● Increase in demand and revenue due to the development of environmentally friendly materials</li> <li>● Increase in sales opportunities due to company efforts to develop environmentally compatible materials</li> </ul>	Major	Major
				<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Increase in operating costs in complying with policy enhancements to drive the shift towards low-carbon emission energy, measures to improve energy efficiency, etc.</li> <li>● Decrease in demand for existing products and services due to the replacement of such products and services with products and services that are energy-efficient and/or that utilize low-carbon emission energy</li> <li>● Increase in manufacturing costs due to the development and implementation of low-carbon technologies/equipment</li> <li>● Increase in costs due to higher electricity prices as a result of the widespread use of renewable energy</li> </ul>	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Decrease in operating costs due to the use of efficient production/logistics processes, efficient means of transportation, etc.</li> <li>● Increase in demand and revenue due to the development and deployment of low-carbon emission energy, energy-efficient products/services, etc.</li> </ul>	Major	Major
				<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Increase in material procurement costs due to the rising prices for resins, minerals, etc.</li> <li>● Increase in costs due to rising raw material prices when switching to alternative materials</li> <li>● Increase in costs due to rising raw material prices when supply chains for such materials are cut off due to natural disasters</li> </ul>	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Decrease in raw material costs due to reductions in the amount of raw materials used, recycling within the process, and discussions towards the use of cheaper and more abundant alternative materials</li> </ul>	Major	Major
	Market	Changes in energy costs	Medium-to long-term	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Increase in operating costs in complying with policy enhancements to drive the shift towards low-carbon emission energy, measures to improve energy efficiency, etc.</li> <li>● Decrease in demand for existing products and services due to the replacement of such products and services with products and services that are energy-efficient and/or that utilize low-carbon emission energy</li> <li>● Increase in manufacturing costs due to the development and implementation of low-carbon technologies/equipment</li> <li>● Increase in costs due to higher electricity prices as a result of the widespread use of renewable energy</li> </ul>	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Decrease in operating costs due to the use of efficient production/logistics processes, efficient means of transportation, etc.</li> <li>● Increase in demand and revenue due to the development and deployment of low-carbon emission energy, energy-efficient products/services, etc.</li> </ul>	Major	Major
		Changes in raw material costs	Medium-to long-term	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Increase in material procurement costs due to the rising prices for resins, minerals, etc.</li> <li>● Increase in costs due to rising raw material prices when switching to alternative materials</li> <li>● Increase in costs due to rising raw material prices when supply chains for such materials are cut off due to natural disasters</li> </ul>	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Decrease in raw material costs due to reductions in the amount of raw materials used, recycling within the process, and discussions towards the use of cheaper and more abundant alternative materials</li> </ul>	Major	Major
Reputation	Changes in Group reputation amongst external stakeholders	Medium-to long-term	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Loss of opportunities due to delays in efforts to develop recycling-based raw materials</li> </ul>	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Efforts to reduce Group's environmental burden through life cycle assessments (LCAs)</li> </ul> <p><b>Moriroku Chemicals</b></p> <ul style="list-style-type: none"> <li>● Increase in revenue due to the development of recycling-based raw materials (low-carbon, biodegradable/biomass plastic materials, etc.)</li> <li>● Increase in revenue due to the provision of raw materials and products adapted to the changes in consumer needs that arise from the rising temperatures</li> <li>● Increase in revenue due to the supplying of new products and services that fit customer adaptation needs in response to climate change, such as health maintenance/disease prevention, resilience enhancement, etc., in areas such as healthcare, agriculture/food, and infrastructure</li> </ul> <p><b>Moriroku Technology</b></p> <ul style="list-style-type: none"> <li>● Increase in revenue due to the development of a wide variety of plastic products, including automobile parts</li> </ul>	Moderate	Major	
			<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Decrease in revenue due to customer transaction restrictions if evaluations find the Group's environmental considerations to be inadequate</li> <li>● Loss of reputation due to the insufficient disclosure of environment-related information</li> <li>● Decrease in procurement funds and increase in financing costs if the Group's environmental considerations are deemed inadequate</li> </ul>	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Increase in credibility and revenue due to environmentally friendly measures and sufficient information disclosure</li> <li>● Strengthening of business continuity ability and increase in supply chain credibility and market value due to measures by the company and within the supply chain to address climate change</li> </ul> <p><b>Moriroku Technology</b></p> <ul style="list-style-type: none"> <li>● Increase in corporate value due to the reputation boost derived from increased demand following the development of environmentally compatible products</li> </ul> <p><b>Moriroku Chemicals</b></p> <ul style="list-style-type: none"> <li>● Increase in corporate value due to higher evaluations from environment-related businesses</li> </ul>	Major	Major	
Physical risks (Analysis based on 4°C scenario)	Acute	Increase in severity of extreme weather events (typhoons, torrential rain, landslides, etc.)	Medium-to long-term	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Increase in disaster-related repair costs due to the increased frequency of extreme weather events</li> <li>● Decrease in manufacturing ability, production volume, etc., and decrease in sales due to sudden manufacturing stoppages or supply chain disruptions caused by extreme weather events</li> <li>● Difficulties in supplying substitute products, increase in raw material costs, etc., due to disruptions of raw material supply networks caused by extreme weather events</li> <li>● Increase in response costs due to the risk of damage to facilities and equipment, procurement risks for raw materials, fuel, etc., and risks in the supplying of products, due to extreme weather events</li> </ul> <p><b>Moriroku Technology</b></p> <ul style="list-style-type: none"> <li>● Material procurement issues due to damage to suppliers from which the company sources its materials, caused by extreme weather events</li> </ul> <p><b>Moriroku Chemicals</b></p> <ul style="list-style-type: none"> <li>● Disruptions in purchasing and sales networks due to the increased frequency of extreme weather events</li> </ul>	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Avoidance of procurement risks and establishment of superiority using the Group's supply response capabilities, based on production in multiple sites across the world</li> <li>● Increase in revenue through entry into the mobility area, which is utilized in the event of disasters (floods, heat waves, etc.)</li> </ul>	Major	Major
				Chronic	Increase in average temperatures	Medium-to long-term	<p><b>Common across Group</b></p> <ul style="list-style-type: none"> <li>● Increase in costs due to the increased use of air conditioners in offices</li> <li>● Increase in time spent on employee health care/management and decrease in productivity due to rising temperatures</li> </ul>