

Scenario analysis

	Hypothetical scenario	Scenario analysis results	Scenario driver	Types of risks and business opportunities	Time frames	Financial impact	Strategies		
Kirin Group Scenario 3 4°C scenario; SSP3, RCP8.5	Laws and regulations on climate change will become more stringent in developed countries, but less so in developing countries, resulting in insufficient reductions to GHG emissions. As a result, global temperatures continue to rise and torrential rains and other natural disasters caused by climate change occur more frequently than at present. The impact of a carbon tax on energy costs will not have a significant impact on business. An increasing number of people face concerns about health impacts as global warming leads to an increase in the number of people at risk for infectious diseases, infections spread even to areas that have not previously been affected by these diseases, and the number of people requiring emergency services for heatstroke rises significantly.	Business risks: <ul style="list-style-type: none"> As a result of global warming, yields of major agricultural raw materials (barley, hops, and coffee beans) decrease significantly, affecting procurement costs. Quality degradation is also expected. There may also be an impact on alternative sugars and agricultural products that are sources of protein, which are required for low-malt and no-malt beer product. Carbon taxes are introduced in major countries where the Kirin Group operates its businesses, but they are low so the impact is negligible. Floods due to extreme rainfall and droughts accompanying climate change cause some business sites to suspend production. Social impact: <ul style="list-style-type: none"> The number of persons requiring emergency services because of heatstroke doubles owing to rising global temperatures. The population exposed to the risk of infectious diseases increases as a result of higher temperatures, and a market for immunity-related products expands and establishes itself. 	Increase in procurement costs due to decline in yields of agricultural products	Physical risk (chronic) / transitional risk (market and reputation)	Medium-to long term	Approx. 3.0 to 12.0 billion yen		<ul style="list-style-type: none"> Brewing technology that does not rely on barley Mass plant propagation technologies Support for farms to acquire the certification for sustainable agriculture 	
			Increase in energy costs due to carbon pricing	Transitional risk (policy and law, technologies, and markets)	Medium-to long term	<table border="1"> <tr> <td>Tax burden if GHGs are not reduced Approx. 1.3 billion yen (2030) Approx. 1.7 billion yen (2050)</td> <td>Tax burden if GHGs are reduced Approx. 0.6 billion yen (2030) 0 yen (2050)</td> </tr> </table>	Tax burden if GHGs are not reduced Approx. 1.3 billion yen (2030) Approx. 1.7 billion yen (2050)	Tax burden if GHGs are reduced Approx. 0.6 billion yen (2030) 0 yen (2050)	<ul style="list-style-type: none"> Reduce GHG emissions on a medium- to long-term profit and loss neutral basis
			Tax burden if GHGs are not reduced Approx. 1.3 billion yen (2030) Approx. 1.7 billion yen (2050)	Tax burden if GHGs are reduced Approx. 0.6 billion yen (2030) 0 yen (2050)					
			Disruptions to operations due to droughts	Physical risk (chronic) / transitional risk (reputation)	Short- and long-term	Approx. 0.6 billion yen (Lion Castlemaine Perkins Brewery) Approx. 30 million yen (Thai Kyowa Biotechnologies)	<ul style="list-style-type: none"> Advanced water usage reduction technologies 		
			Disruptions to operations due to floods	Physical risk (chronic)	Short- and long-term	Approx. 1.0 billion yen (Lion Castlemaine Perkins Brewery) Approx. 5.0 billion yen (Sendai Brewery)	<ul style="list-style-type: none"> Development of flood response manuals 		
			Decline in yields of agricultural raw materials due to droughts and floods	Physical risk (chronic)	Medium-to long term	Included in procurement costs due to decline in yields of agricultural products (See above)		<ul style="list-style-type: none"> Measures to address extreme rainfall and conserve water sources in areas where agricultural raw materials are produced 	
			Population requiring emergency services for heatstroke	Physical risk (chronic)/ transitional risk (market) / products and services/ markets	Short- and long-term	In 2050, the size of the Japanese market is expected to increase by a factor of 2-4x compared with the years 1981 to 2000, growing to between 90 billion yen and 190 billion yen		<ul style="list-style-type: none"> Contribute to products to counter heatstroke 	
Population exposed to infectious diseases	Physical risk (chronic)/ transitional risk (market) / products and services/ markets	Short- and long-term	The market for immune-related products in Asia as whole is expected to increase by a factor of 1.8x compared with 2020, to around 750 billion yen by 2030		<ul style="list-style-type: none"> Contribute to products that support consumers' immune systems 				
Kirin Group Scenario 1 2°C or 1.5°C scenario; SSP1, RCP2.6	In addition to a carbon tax, carbon border adjustment mechanism are introduced, and stringent climate change laws and regulations are in place around the world. As a result, the increase in global temperature is suppressed, climate disasters do not increase much more than the current level, and the impact on agricultural yields is limited. On the other hand, carbon taxes and other regulations lead to increases in energy costs and affect other procurement items. Although global warming does not have a significant impact on human health, the impact of climate change becomes increasingly noticeable on a daily basis, including hot summer days and typhoon damage.	Business risks: <ul style="list-style-type: none"> Although yields of major agricultural raw materials decline owing to global warming, the impact on procurement costs is negligible. The impact is negligible on alternative sugars and agricultural products that are sources of protein, which are required for low-malt and no-malt beer product. Energy costs are significantly higher because of carbon taxes introduced in the major countries in which the Kirin Group operates its businesses. Some business sites are affected by floods caused by extreme rainfall and droughts associated with climate change, but it is within the scope of our ability to respond. Social impact: <ul style="list-style-type: none"> Although the number of persons requiring emergency services for heatstroke increases owing to rising global temperatures, it is not at a level that causes significant concern. The population exposed to the risk of infectious diseases increases as a result of higher temperatures, leading to increased interest in enhancing immunity. 	Increase in procurement costs due to decline in yields of agricultural products	Physical risk (acute)	Medium-to long term	Approx. 1.0 to 2.5 billion yen		<ul style="list-style-type: none"> Brewing technology that does not rely on barley Mass plant propagation technologies Support for farms to acquire the certification for sustainable agriculture 	
			Increase in energy costs due to carbon pricing	Transitional risk (policy and law, technologies, and markets)	Medium-to long term	<table border="1"> <tr> <td>Tax burden if GHGs are not reduced Approx. 7.7 billion yen (2030) Approx. 9.9 billion yen (2050)</td> <td>Tax burden if GHGs are reduced Approx. 3.9 billion yen (2030) 0 yen (2050)</td> </tr> </table>	Tax burden if GHGs are not reduced Approx. 7.7 billion yen (2030) Approx. 9.9 billion yen (2050)	Tax burden if GHGs are reduced Approx. 3.9 billion yen (2030) 0 yen (2050)	<ul style="list-style-type: none"> Reduce GHG emissions on a medium- to long-term profit and loss neutral basis
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			Disruptions to operations due to droughts	Physical risk (acute)	Short- and long-term	Same as 4°C scenario, but probability of occurrence is expected to be low		<ul style="list-style-type: none"> Advanced water usage reduction technologies 	
			Disruptions to operations due to floods	Physical risk (acute)	Short- and long-term	Same as 4°C scenario, but probability of occurrence is expected to be low		<ul style="list-style-type: none"> Development of flood response manuals 	
			Decline in yields of agricultural raw materials due to droughts and floods	Physical risk (acute)	Medium-to long term	Same as 4°C scenario but not significant		<ul style="list-style-type: none"> Measures to address extreme rainfall and conserve water sources in areas where agricultural raw materials are produced 	
			Population requiring emergency services for heatstroke	Physical risk (acute)/ transitional risk (market) / products and services/ markets	Short- and long-term	Same as 4°C scenario but not significant		<ul style="list-style-type: none"> Contribute to products to counter heatstroke 	
Population exposed to infectious diseases	Physical risk (acute)/ transitional risk (market) / products and services/ markets	Short- and long-term	Same as 4°C scenario but not significant		<ul style="list-style-type: none"> Contribute to products that support consumers' immune systems 				

* Types of risks and business opportunities: Determined according to the TCFD risk and opportunity types and categories

Time frames: Determined as follows: Short-term: 2021 to 2024 (from present to period of next mid-term business plan); medium-term: 2025 to 2030 (period covered by KV2027 and the SDGs); and long-term: 2031 to 2050 (target year for the Kirin Group's Environmental Vision 2050)