

Climate-Related Risk and Opportunity Analysis in DS Division

Identification of Key Risks and Opportunities

We constructed a pool of climate-related risks and opportunities related to our business by reviewing global climate change trends, industry responses, and the climate-related risks and opportunities presented in the Task Force on Climate-related Financial Disclosures (TCFD) recommendations and by the Carbon Disclosure Project (CDP). We also identified key risks and opportunities through climate-related scenario analysis, internal and external stakeholder surveys, and expert and departmental roundtable discussions. Identified physical risks were mainly chronic, affecting all short-, medium-, and long-term periods. Transition risks and opportunities primarily impacted the medium- and long-term.

Key Risks and Opportunities

Type	Risks and Opportunities				
Physical Risks	Acute	Typhoon	Flood	Wildfire	Hail, Thunderstorm
	Chronic	Drought	Extreme heat	Heavy rainfall	Extreme cold
	Policy and Legal	Increase in cost of purchasing carbon credits			
Transition Risks	Market	Insufficient alignment with customer demand for low-carbon products			
	Market	Increase in production cost due to changing energy prices			
	Technology	Increase in R&D cost for low-carbon products and services			
Opportunities	Technology	Transition to low-carbon production processes			
	Reputation	Stakeholder concerns and negative media coverage related to climate change			
	Market	Use of renewable energy			
Opportunities	Market	Increase in demand for low-carbon products and services			
	Technology	Use of low-carbon production processes			
	Technology	Reduction in water use and consumption			
Opportunities	Resilience	Enhancing our company's resilience to climate change			
	Resilience	Enhancing the supply chain's resilience to climate change			
	Resilience				

Financial Impact Assessment

The DS Division analyzed the potential financial impacts of identified key risks and opportunities through both quantitative and qualitative assessments, taking into consideration various climate-related scenarios in alignment with international climate change agreements.

Climate-Related Scenario Selection

Type	Source	Scenario	Definition
Physical Risks	IPCC ¹⁾	SSP1-2.6	Assumes net zero emissions by 2075 (Low-carbon emission scenario)
		SSP2-4.5	Assumes current levels of carbon emission until 2050, net zero carbon emission not achieved by 2100
		SSP5-8.5	Assumes fossil fuel-based development (High-carbon emission scenario)
Transition Risks and Opportunities	IEA ²⁾	Net Zero Emissions by 2050	Assumes net zero emissions in the energy sector by 2050
		Announced Pledges	Assumes full implementation of all national climate commitments worldwide
		Stated Policies	Assumes maintenance and implementation of current policies
Transition Risks and Opportunities	NGFS ³⁾	Net Zero 2050	Assumes global net zero emissions by 2050
		NDCs ⁴⁾	Assumes full implementation of currently pledged Nationally Determined Contributions worldwide
		Current Policies	Assumes maintenance and implementation of current policies

1) Intergovernmental Panel on Climate Change

2) International Energy Agency

3) Network for Greening the Financial System

4) Shared Socio-economic Pathway

5) Nationally Determined Contributions

1. Physical Risks

We analyzed hazard exposure levels and financial impacts of identified major physical risks at all our sites by scenario¹⁾ and time period²⁾ using a global analysis tool incorporating IPCC scenarios, climate modeling data, and location information. As a result, under the SSP5-8.5 scenario, extreme heat exposure at Korean sites increases in the long term, relative to the short and medium terms. From a financial impact perspective, droughts and typhoons emerged as the key physical risks across all climate-related scenarios. Of these, the financial impacts of droughts are as follows.

1) Scenarios widely recognized by major global institutions were used. Scenarios may inherently contain uncertainties and differ from actual future situations.

2) Short term: ≤1 year (2025), Mid-term: 1~5 years (2026~2029), Long-term: >5 years (2030~2050)

Drought

We assessed drought exposure levels by analyzing the balance between water demand and supply in each DS site location, then calculated financial impacts based on potential future water prices¹⁾. Our analysis shows water prices aren't expected to rise dramatically overall compared to current levels, but facilities expecting increased demand will likely experience relatively greater financial impacts.

1) Shadow price of water: Value of water based on water stress indices and population data in the Corporate Bonds Water Credit Risk Tool

2. Transition Risks and Opportunities

We conducted a literature review and consulted external experts to develop an assessment methodology for financial impacts of risks and opportunities associated with the transition to a net zero society. Based on this, we assessed the financial impacts by utilizing internal strategies—including carbon reduction roadmaps aimed at achieving net zero by 2050—and external outlook data from the IEA and NGFS. The result showed that the increase in production cost due to changing energy prices, as well as the increase in cost of purchasing carbon credits, represent key transition risks. Meanwhile, the use of renewable energy and the reduction in water use and consumption were identified as key opportunities. The below explains how some of these factors influence our operation as risk or opportunity.

Increase in Cost of Purchasing Carbon Credits

Carbon credit prices are expected to increase due to the strengthening GHG regulations and policies, potentially reaching USD 250 per tonne¹⁾ by 2050 according to the IEA's Net Zero Emissions by 2050 scenario. Our Korean sites are subject to South Korea's Emissions Trading System (ETS), being responsible for additional costs corresponding to any potential GHG emissions beyond nationally allocated quotas. Furthermore, should the carbon credit prices increase due to national GHG reduction targets and carbon neutrality policies, the cost of purchasing carbon credits is expected to increase.

1) Prices based on net zero emissions pledges

Reduction in Water Use and Consumption

We are expanding investments in and operations of facilities to enhance water reuse rates as part of our response to climate change. Financial impact analyses revealed that cost savings from reduced water use are significantly positive impacts by offsetting potential losses from physical risks such as droughts. This is expected to have positive impacts by offsetting potential losses from physical risks such as droughts.

Assessment of Financial Impact Levels from Drought

*Average anticipated financial impact was calculated across climate-related scenarios (SSP1-2.6, SSP2-4.5, SSP5-8.5) and time periods (short, medium, long-term) to comparatively analyze financial impacts for each site.

Drought

We are actively implementing measures to minimize financial impacts resulting from droughts. By diversifying water sources and collaborating with suppliers, we established an emergency water supply system that enables stable operation of our sites even during periods of water scarcity. In addition, as the semiconductor industry is a national strategic industry in Korea, it benefits from diverse policy support from the government regarding the stable water supply. It serves as a critical foundation for strengthening our resilience.

Increase in Cost of Purchasing Carbon Credits

We mitigate financial impacts from rising carbon credit prices by pursuing our net zero Scope 1 and 2 emissions target under the New Environmental Strategy. We reduce direct emissions through large-scale integrated process gas treatment facilities (RCS, Regenerative Catalytic System) and waste heat recovery systems. For indirect emissions, we

reduce power usage in the production process with simultaneous transitioning to renewable energy. This helps mitigate vulnerabilities to fluctuations in energy cost and emission-related policies, enabling a reduction in carbon credit costs at our sites subject to the Korean emissions trading system.

Reduction in Water Use and Consumption

We set goals for water reuse rates and systematically manage related facility investment and operational costs. This approach not only mitigates water risks due to climate change but also creates financial opportunities by enhancing operational efficiency and reducing costs, thereby strengthening our climate resilience.

Resilience Assessment

A quantitative and qualitative evaluation was conducted on key risks and opportunities having financial impacts to assess our capacity to respond, recover and adapt. Representative examples of the results are as follows.

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