

Polyplastics Group's Initiatives to Prevent Climate Change and Realize Carbon Neutrality

In FY2022, the Polyplastics Group identified risks and opportunities related to climate change and considered their impact and countermeasures.

1-1 Scenario Analysis Assumptions

1. Scope of Scenario Analysis

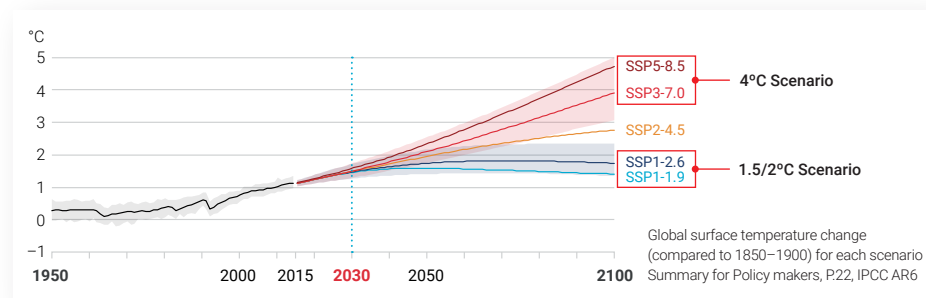
POM, PBT, PPS, LCP, and COC businesses operated by Polyplastics
 Scope: Consolidated companies

2. Scenario Assumptions

Based on information provided by the IPCC and IEA, etc., we considered risks and opportunities based on a 1.5°C/2°C global surface temperature rise scenario in which decarbonization advances, and a 4°C scenario in which decarbonization does not progress.

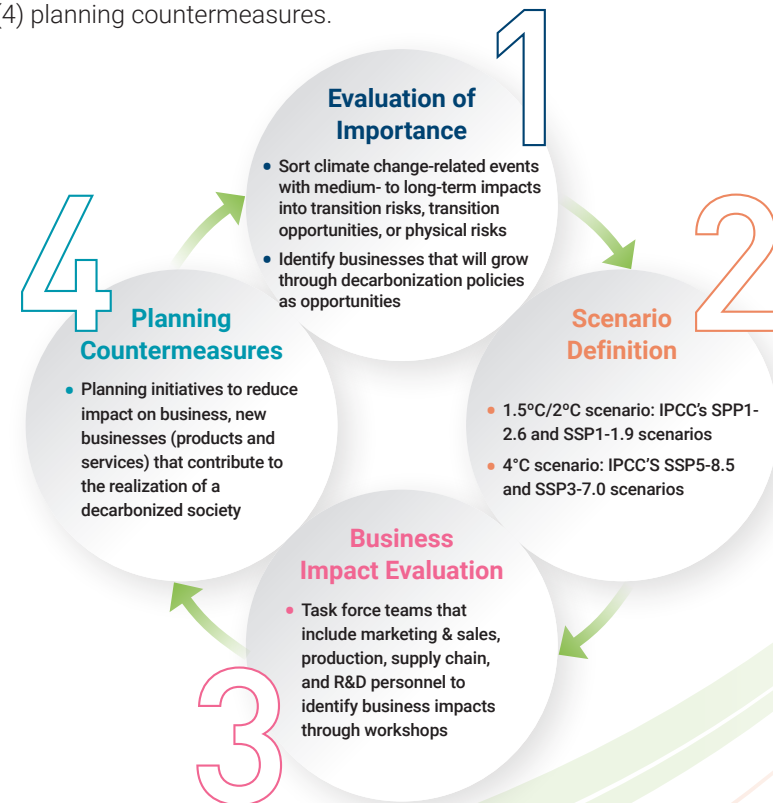
3. Timescale

Transition risks and opportunities and physical risks as of 2030 were considered.



1-2 Scenario Analysis Process

Scenario analysis was conducted using the following process (see figure below): (1) evaluation of importance, (2) scenario definition, (3) business impact evaluation, and (4) planning countermeasures.





1-3 Scenario Overview (1.5°C/2°C)

Societal Changes

- In order to keep the average temperature increase to less than 2°C by the end of the century, strong legal and regulatory enforcement and technological innovations will be promoted
- Environmental performance (low environmental impact) is as valuable to customers as quality, cost, and delivery (QCD), in line with their efforts to realize decarbonization globally
- In the chemical industry, corporations and businesses unable to adapt to decarbonization will be eliminated and raw material procurement risks will increase due to corporate consolidation
- Criticism from society for non-compliance with environmental policies becomes severe (conditions lead to customers stopping transactions)
- Increased share of renewable energy sources will destabilize the power supply

Technological Innovation

- Technologies related to carbon capture and utilization (CCU) and resource recycling are actively developed and will be put into practical use by 2030
- Investment in CO₂-reduction technologies will increase, and whether or not appropriate technology is acquired will directly affect cost competitiveness

Climate Change

- Increasing severity of disasters such as typhoons and floods
- Increasingly extreme weather events such as heat waves

Scenario Overview (4°C)

Societal Changes

- Division between regions that are quick to implement strong laws and regulations, especially in Europe, and regions that are slow to introduce strict regulations, especially in emerging nations whose focus is on economic growth results in slow progress in GHG reduction
- Limited number of customers choosing to evaluate environmental performance (low environmental impact)
- Lack of aggressive investment in the fossil fuel and chemical industries and consolidation due to aging facilities will increase risk associated with raw material and fuel procurement
- Criticism from society for non-compliance with environmental policies becomes severe (conditions lead to customers stopping transactions)
- Increased share of renewable energy will destabilize electricity supply in some regions

Technological Innovation

- Increased energy prices encourage investment in energy-saving technology, and the availability of such technology will directly affect cost competitiveness

Climate Change

- Increasing severity of disasters such as typhoons and floods
- Increasingly extreme weather events such as heat waves



2 Polyplastics Group's Initiatives to Prevent Climate Change

To continue as an excellent solution provider, Polyplastics has promised to proactively reduce its product carbon footprint (PCF) and address climate change risks (adapt to the 1.5°C/2°C scenario and achieve growth).

Basic Strategies

- 1 Reducing costs and CO₂ emissions through proactive environmental investment
- 2 Introducing energy from low environmental impact sources
- 3 Reducing PCF by working with suppliers
- 4 Expanding recycled products and investing in recycling technology development
- 5 Securing stable supplies of low-CO₂ raw materials
- 6 Stabilizing quality (uniformity and multi-origin), optimizing grade lineup, and evolving technical services
- 7 Actively participating in GX-ETS and other GHG reduction schemes and complying with laws and regulations
- 8 Proactively providing PCF and other environmental performance data to customers



3 Risk and Response (Transition Risks)

	Risks	Financial Impact (billion/year)		Our Initiatives	
		4°C Scenario	1.5°C/2°C Scenario		
Transition Risks	Taxation on GHG Emissions	Impact of imposing a carbon tax on the 2030 business-as-usual emissions	1.6	10.8	Cutting impact in half by promoting activities to achieve the Daicel Group's GHG reduction target (50% total GHG emissions reduction compared to FY2018)
	Increased Raw Material Prices	<ul style="list-style-type: none"> Carbon tax equivalent to the amount of CO₂ contained in raw materials will be passed on to Polyplastics Increased raw material prices due to high fossil fuel prices Increased working capital (increased interest burden) 	3.3	17.5	<ul style="list-style-type: none"> Reducing impact by working with suppliers to reduce GHG emissions Reducing working capital by improving inventory management
	Carbon Border Adjustment Mechanism (CBAM)	Goods produced in Asia are subject to a different carbon tax when exported to Europe	1.5	0.5	Reducing impact through energy-saving and implementing the procurement of low-CO ₂ materials
	Environmental Compliance Violations	Being excluded from new development projects as a result of suspension of transactions with customers due to non-compliance	0.4	0.4	Maintaining ISO 14001 certification and strengthening systems related to environmental response
	Simplification of Raw Material Composition	Customers demand the simplification of raw material formulations for easy recycling, increasing the difficulty of designing compounds for functionality	—	—	Resolving risks by accelerating technology development and by applying expertise in formulation design and technical services
	Consolidation of Raw Material Suppliers	Difficulty in procuring raw materials due to consolidation in the chemical industry, forcing a change to alternative raw materials (impact not yet calculated)	—	—	Reducing impact by promoting multiple purchases, simplifying raw materials through formulation, and promoting uniform quality through improved manufacturing technology
	Increased Prices of Low-PCF Raw Materials, Difficulty in Procurement	Due to competition for bio-materials, etc., price hikes and procurement difficulties (securing physical inventories) occur, raising concerns about cost increases and supply responsibility	1.0	1.0	Developing CCU methanol within the Daicel Group, having long-term procurement agreements on low-PCF raw materials



3 Risk and Response (Physical Risks)

		Risks	Financial Impact (billion/year)		Our Initiatives
			4°C Scenario	1.5°C/2°C Scenario	
Physical Risks	Operations decrease due to power instability	Operations decrease due to plants being unable to procure the required power	0.5	0.5	Developing a response plan to minimize the impact of reduced operations at each plant in the event of a power outage
	Flooding of plants	Damage to plants and facilities from flooding exceeding previous assumptions	—	—	Investigating flood risks and preventing damage by making the necessary facility modifications and formulating a business continuity plan for floods
	Deterioration of work environment due to climate change	Slowdown of production and other activities due to declining work conditions, including increased instances of heat stroke, and the spread of infectious diseases	—	—	Ensuring health and safety is essential to a company's sustainability, and we will continue to improve the workplace environment as we have in the past.

The following physical risks were also considered and discussed.

Although it could be assumed that natural disasters will not be drastically impactful in 2030, we will concretely implement risk management efforts through thorough discussion with our partners, including suppliers and logistics companies.

- Suspended or reduced operations at suppliers' and customers' offices and plants due to water shortages, floods, power outages, etc.
- Interruption or delay of logistics channels
- Impact on operations of power outages and transportation stoppages
- Product and raw material quality loss due to floods



4 Opportunities

		Creating Business Growth	Financial Impact (billion/year)		Our Initiatives
			4°C Scenario	1.5°C/2°C Scenario	
Opportunities	Business expansion through products for environmental load reduction	Incremental profit gain from converting customers' environmental needs into growth opportunities in the engineering plastics business	1.8	7.5	<ul style="list-style-type: none"> Developing the recycling business (Re-compounding business) Developing low-CO₂ products (utilization of CCU technology, development of bio-based raw material products)

5 Investment

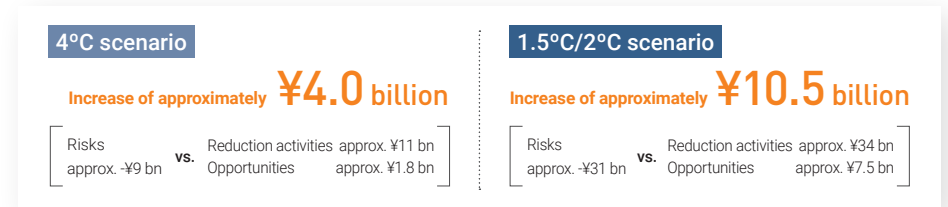
As part of Polyplastics' initiatives towards Carbon Neutrality, we will invest ¥34.0 billion by 2023.

- Conversion to high-efficiency production processes
- Installation of energy-saving equipment
- Installation of equipment for the commercialization of recycled products
- Switching to green energy

The Daicel Group will promote Groupwide efforts to stably procure low-CO₂ raw materials (monomers).

6 Financial Impacts on Polyplastics' Businesses (Summary)

Through Polyplastics' efforts towards Carbon Neutrality, we will actively implement activities to reduce risks of financial impact and aim to expand our business as a growth driver.



In addition, as part of its responsibility as a supplier, Polyplastics will work to reduce the carbon tax burden (including CBAM, recycling regulations, etc.) by providing low-CO₂ products.





7 Management Indicators and Targets for 2030

KPIs

- Reduce PCF (cradle-to-gate basis) by 46% (compared to FY2013)
- Reduce GHG emissions by 50% (compared to FY2018 Daicel Group levels)
- Increase the rate of circulated materials used to 25% (realize engineering plastics recycling, methanol CCU, biomonomer procurement)
- Increasing sales of recycled products (grade using recycled materials) to 10%

In November 2021, the Daicel Group endorsed the Task Force on Climate-related Financial Disclosures (TCFD) recommendations. In line with the TCFD recommendations, Polyplastics will proceed with governance, strategy, risk management, and the disclosure of indicators and targets related to climate change.

The Polyplastics Group, as part of the Daicel Group, is committed to governance and risk management in its climate change initiatives and will continue to pursue activities to realize the strategy as well as indicators and targets.

Polyplastics Group is committed to addressing climate change in line with the Daicel Group's TCFD policy.

Please see [here](#) for the Daicel Group's TCFD initiatives