

Green Transformation (GX)

To create new value by strengthening its business platform and enhancing the sophistication of its businesses, the Asahi Kasei Group is focused on the key areas of green (G), digital (D), and people (P). As green transformation (GX) is a shared and pressing task globally, initiatives are advanced including cooperation with other companies.

Aiming to Create a Carbon-Neutral and Sustainable World

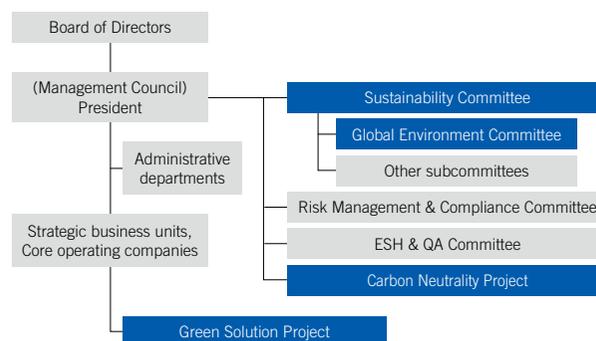
With GX as a key for enabling “harmony with the natural environment” under our Group Vision, we aim to create a carbon-neutral and sustainable world. We are working to achieve this aim through a two-pronged approach: reducing GHG emissions from our business activities and contributing to reducing society’s GHG emissions.

We are targeting a reduction of 30% or more GHG emissions from our business activities by fiscal 2030 (compared with fiscal 2013), and our goal is carbon neutrality by 2050. We aim to achieve carbon neutrality with efforts centered on the utilization of existing technologies up to 2030 in combination with efforts over the medium to long term looking ahead to 2050, including the development of new technologies. The evolution of our business portfolio, as set out in the medium-term management plan (MTP), is also a vital element in achieving these goals.

To contribute to reducing society’s GHG emissions, we will capitalize on the diverse technologies and businesses that are a distinctive feature of the Asahi Kasei Group to pursue the development of products and the creation of businesses that will help reduce GHG emissions from a variety of perspectives. Given that reducing society’s GHG emissions requires a fundamental transformation of social structures, people’s lifestyles, and other matters, we will proactively cooperate with other companies across industries and promote initiatives with government agencies and other parties. Through these efforts, we will also advance our own evolution and growth.

■ Framework for Promoting GX

In fiscal 2019, we established a Sustainability Committee with the goal of promoting sustainability across the Asahi Kasei Group. Chaired by the President and with Executive Officers for Business Sectors, Technology Functions, and Business Management Functions as members, the committee shares information on sustainability-related issues including global environmental measures and provides direction for activities. In fiscal 2021, in order to accelerate our contribution to reducing society’s GHG emissions, we launched a Green Solution Project to advance the creation of new businesses aimed at achieving carbon neutrality. Regarding efforts to reduce GHG emissions from our business activities, we appointed an Executive Officer for Carbon Neutrality and established a dedicated project in fiscal 2022. The project has begun detailed discussions on clarifying and giving concrete form to our roadmap for carbon neutrality.



■ GX in Management Strategy

GX is one of the pillars of the Asahi Kasei Group’s management strategy. In our MTP, we formulated our growth strategy based on megatrends related to climate change. As initiatives related to climate change, pursuing business opportunities from the perspective of reducing risks related to our businesses and mitigating and adapting to climate change are key tasks along with transforming our business portfolio.

To implement these initiatives related to climate change, we have also allocated a budget for investments related to decarbonization to give greater priority to such investments, and are prepared to implement investments totaling approximately ¥60 billion over the three years to fiscal 2024.

To raise awareness and encourage actions for achieving carbon neutrality, we operate internal carbon pricing (ICP) that tracks GHG emissions from our business activities as a monetary value. We seek to carefully select investment projects in order to increase production and accelerate investments that reduce CO₂ emissions by incorporating a monetary value of ¥10,000 per ton of CO₂ emissions into calculations to determine the profitability of capital expenditures. We also incorporate ICP into performance evaluations for internal awards. Furthermore, we calculate and provide data to customers on the carbon footprint of our products—GHG emissions from the extraction of raw materials to manufacture and shipment—with a view to accelerating the reduction of society’s overall GHG emissions.

Reducing GHG Emissions from Business Activities

Asahi Kasei has adopted the following targets for Scope 1 (direct GHG emissions) and Scope 2 (indirect GHG emissions from the use of electricity, heat, and steam supplied by other companies), which are the GHG emissions that our business activities most directly affect as a manufacturer, and that we are most expected to reduce.

Targets	
2030	Target to reduce GHG emissions by 30% or more (compared with fiscal 2013)
2050	Goal to achieve carbon neutrality (net-zero emissions)

In the period covered by the first step toward reducing GHG emissions from our business activities, leading up to 2030 we will advance reductions with a focus on existing technologies. In the second step, which we will promote from 2030 to 2050, we will advance reductions centered on the utilization of new technologies.

Specifically, in the first step we will aim to reduce 300,000 tons of emissions through the low-carbonization of in-house

power generation, between 100,000 tons and 200,000 tons through purchases of non-fossil fuel electricity, and between 100,000 tons and 200,000 tons through manufacturing process improvement and innovation. In addition, we will transform our business portfolio with an emphasis on the perspective of GHG emission reductions.

In the second step, we will seek to achieve carbon neutrality by 2050 through the greening of electricity and steam through the practical application of decarbonization technologies developed by the Asahi Kasei Group, such as alkaline water electrolysis technology, the innovation of manufacturing processes, and the further transformation of our business portfolio.

Progress to Fiscal 2021

The Asahi Kasei Group is successively upgrading and raising the capacity of the hydroelectric power facilities it owns, primarily in Miyazaki Prefecture. In addition, we converted one of our independently owned coal-fired thermal power plants to run on

liquefied natural gas in order to reduce GHG emissions, with start-up in March 2022. The fuel conversion is expected to reduce GHG emissions by approximately 160,000 tons annually. We are also expanding our utilization of biomass fuel and solar power. For example, the Italian manufacturing site of Sage Automotive Interiors, Inc., and the Shiga Plant of Asahi Kasei Jyuko Co., Ltd., are proactively utilizing solar power generation. The Asahi Kasei Group has also begun using electricity generated from solar power systems installed on Hebel Maison™ apartment buildings of Asahi Kasei Homes Corp.

Accelerating the Utilization of Carbon Footprints

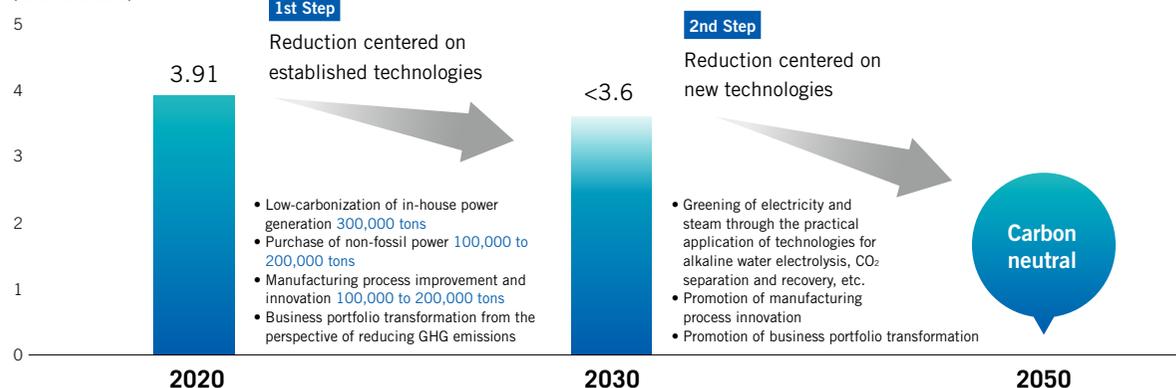
Calculating the carbon footprint of products and services and providing that data to customers represents an important role that a materials manufacturer can play in helping society as a whole achieve carbon neutrality. With a focus on our mainstay products, we are advancing the calculation of the carbon footprint of products while utilizing digital technology.

In May 2022, we established a system to calculate the carbon footprint of synthetic rubber and elastomer products, and began providing the data to customers in June. Using this system, we can adjust the unit size and scope of the carbon footprint data we calculate, enabling us to ascertain data according to needs. We have also established a platform for calculating the carbon footprint of performance resins used as material for automobile parts, electronic parts, etc., by ascertaining GHG emissions of each product grade.

Leveraging these leading examples, we will utilize digital technology to establish a framework enabling us to grasp the carbon footprint of products in each of our businesses.

Roadmap to 2050

(Million tons CO₂-e)



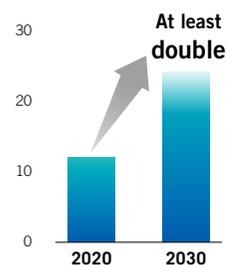
Contribution to Reducing Society's GHG Emissions

To contribute to reducing society's GHG emissions, we are working to reduce such emissions from a life cycle assessment (LCA) perspective, which assesses the impact of our products and services with an emphasis on reducing environmental impact across their entire life cycle. We have adopted the following targets in order to advance the further expansion and new development of products and services that contribute to such reductions.

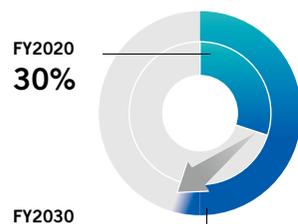
Targets	2030
	<ul style="list-style-type: none"> • At least double the contribution to reduced GHG emissions (compared with fiscal 2020) • Increase the sales ratio of environmental contribution products

Based on the opinions of outside experts, the Asahi Kasei Group independently calculates the amount of contribution to GHG emission reduction from an LCA perspective. We have designated a total of 20 products and services as environmental contribution products in fiscal 2022. We are proactively promoting the development and widespread adoption of environmental contribution products, aiming to at least double their contribution to reduced GHG emissions by fiscal 2030 compared with

GHG Reduction by Environmental Contribution Products
(Million tons CO₂-e)



Sales Ratio of Environmental Contribution Products
(%)



fiscal 2020. Looking ahead to fiscal 2030, we also aim to further increase the sales ratio of environmental contribution products, which currently account for approximately 30% of total consolidated net sales excluding the Health Care sector.*

* As the Health Care sector emphasizes providing value to society from the perspective of enabling "living in health and comfort," its net sales are excluded from the calculation.

Expansion of Environmental Contribution Products Defining environmental contribution products

Taking into account reviews by outside experts, the Asahi Kasei Group assesses the environmental contribution level of products proposed by its strategic business units and core operating companies from an LCA perspective. The products and services that are recognized internally as contributing to the environment are designated "environmental contribution products." We assess such products and services from the perspectives of climate change (including CO₂ emission reduction, energy saving, and renewable energy), resources (waste reduction, recycling, water resources, and raw materials), biodiversity, and prevention of environmental pollution. As efforts to develop and expand such products contribute to reduced environmental impact in society while fostering the growth of our businesses, they also help promote the two mutually reinforcing aspects of sustainability of "contributing to sustainable society" and "the sustainable growth of corporate value," which we aim for.

Polycarbonate manufacturing technology using CO₂

Polycarbonate is a high-performance plastic used in a wide range of products, such as DVDs, Blu-ray discs, housings for smartphones and other consumer electronics, automobile headlight covers, and windows for airplanes and high-speed

trains. Asahi Kasei was the first company in the world to commercialize technology for making polycarbonate using CO₂ and ethylene oxide, and has licensed the technology to polycarbonate manufacturers globally. This technology recovers CO₂ that would otherwise be emitted into the atmosphere from other plants, and uses it as a material to manufacture polycarbonate, which reduces CO₂ emissions compared with conventional manufacturing methods. In addition, as the manufacturing process involves materials alone, without using solvents, the absence of any environmental impact in conjunction with disposing of used solvents is also a distinguishing feature.

Reduction of energy consumption by using CO₂ sensors

The Asahi Kasei Group has developed CO₂ sensors—small, high-precision, low-power gas sensors that measure CO₂ concentration levels in the air—by combining the module technology of Senseair AB, a company we acquired, with our own compound semiconductor technology. While optimal ventilation in accordance with air quality can improve the energy efficiency of air conditioning in buildings and large structures, this requires the high-precision measurement of CO₂ concentration levels. Our CO₂ sensors are suited to this application, helping to reduce the electricity consumption of heating and cooling systems. As the measurement of CO₂ concentration levels is similarly essential for the energy efficiency of the air conditioning of electric vehicles (EVs), we will strengthen our environmental contribution by increasing the sales of our CO₂ sensors in line with the widespread adoption and expansion of EVs.



Initiatives Regarding Climate Change Disclosure Based on the TCFD¹ Recommendations

The Asahi Kasei Group examines the changes that are expected to occur due to climate change and their impact on its businesses from a variety of perspectives. Along with posing risks, climate change also presents opportunities for Asahi Kasei. Our new medium-term management plan (MTP), which is currently in progress, was formulated with these risks and opportunities in mind. We will contribute to the creation of a sustainable society through our diverse technologies and businesses while proactively promoting climate change adaptation and mitigation measures as growth opportunities.

■ Corporate Governance

The Asahi Kasei Group regards promoting measures to address climate change as an important management task. Accordingly, these measures are one of the core themes of our management strategy.

Policies and important matters regarding climate change are deliberated and decided by the Board of Directors, and specific related matters are determined by the Management Council, the decision-making body for business execution (specifically, these include decisions on MTPs, GHG emission reduction targets, and capital expenditure plans, as well as confirming the state of their progress).

Our Sustainability Committee, which is chaired by the President, promotes the decisions of the Board of Directors and the Management Council at the business level. At meetings of the Sustainability Committee, members of executive

management share information on and discuss issues related to sustainability, including climate change. The results of these discussions are reported to the Board of Directors, which then discusses issues including the state of initiatives for the whole Asahi Kasei Group. We are also working on a specific roadmap for achieving our GHG emission reduction targets through the Carbon Neutrality Project (please see [page 29](#)  for a diagram on this system).

■ Strategy

Basis of analysis

We examined the impact on our current businesses and the new opportunities for us leading up to 2050 based on a +4°C scenario in which global warming countermeasures have not progressed adequately (IPCC, SSP3-7.0²) and a +1.5°C scenario in which CO₂ emissions have been significantly curbed in order to rein in temperature rises (*WEO*, Net Zero Emissions by 2050 Scenario (NZE)³).

Note: Our analysis is based on a variety of assumptions. Changes to these assumptions may result in actual risks and opportunities differing significantly from the analysis.

Risks

Under the +4°C scenario, we primarily anticipate physical risks, such as intense heat, heavy rain, and floods. In particular, we perceive damage to production sites caused by the effects of increasingly severe storms and floods and the resultant cost of such damage to be a risk for our major sites in Japan and overseas. Under the +1.5°C scenario, in addition to tightened

Estimated Cost of CO₂ under the +1.5°C Scenario

The Asahi Kasei Group currently emits approximately four million tons of CO₂ (Scopes 1 and 2) per year. Assuming a CO₂ price of ¥10,000 per ton, the annual cost of these emissions would come to ¥40.0 billion. As we are reducing our emissions with the goal of achieving carbon neutrality by 2050, this cost is declining. Under a trial calculation based on the required CO₂ price⁴ and our CO₂ reduction targets, the total cost of emissions until 2050 would be ¥530.0 billion on a cumulative basis (using a present value discount rate of 5%).

Meanwhile, the Asahi Kasei Group has approximately ¥1.7 trillion in net assets (as of March 31, 2022) and is positioned to record positive net income every year up to 2050. We will accurately perceive climate change risks, including CO₂ costs, to pursue business opportunities and evolve our business portfolio. We will endeavor to expand net assets and enhance shareholder returns through strategic investments in businesses that contribute to the environment.

regulations through carbon pricing and other government policies primarily aimed at achieving decarbonization, we anticipate a shift in demand to materials suitable for decarbonization as a risk. We also anticipate market structure changes resulting from an acceleration in the transition to a circular economy and the emergence of innovative technologies designed to create a decarbonized society as risks.

While the degree of these risks varies, we are advancing risk mitigation initiatives based on the view that all may manifest as the climate changes going forward.

¹ TCFD: Task force on Climate-related Financial Disclosures. The TCFD was established and its recommendations were officially announced by the Financial Services Board in 2017.

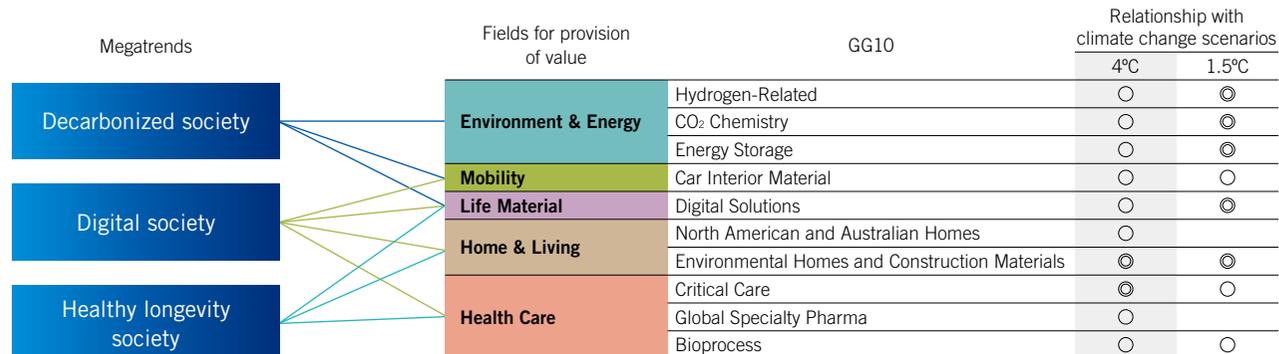
² One of the scenarios in the sixth report of the Intergovernmental Panel on Climate Change (IPCC). SSP stands for Shared Socio-Economic Pathway and SSP3-7.0 refers to a regional rivalry in which no climate change countermeasures are enacted and temperatures rise 4°C by 2100.

³ One of the scenarios in *World Energy Outlook (WEO) 2021*, prepared by the International Energy Agency (IEA). NZE is a scenario for achieving global net-zero emissions by 2050 in order to limit temperature rises to 1.5°C by 2100.

⁴ CO₂ prices (US\$/tCO₂) under NZE in *WEO 2021*: US\$130 in 2030, US\$205 in 2040, and US\$250 in 2050.

Opportunities

The Asahi Kasei Group has positioned Environment & Energy, Mobility, Life Material, Home & Living, and Health Care as fields for provision of value in its MTP. We have also designated GG10 as businesses in which we will focus resources to achieve growth. Established on the basis of megatrends related to climate change, these fields can clearly provide value in terms of mitigation and adaptation under various climate change scenarios, even considering the latest IPCC and IEA reports. Accordingly, we believe that our business promotion and direction can provide various products and services as business opportunities to address climate change.



Note: ◎ Deemed to have a strong relationship, including a direct reference in the sixth IPCC report and in *WEO 2021*
 ○ Although not as strong as the above, expected to be broadly related

Risks	Important Changes	Main Risks	Major Initiatives
+4°C scenario	Serious storm and flood damage	“Physical” production risks • Impact on production from damage to plants or suppliers	• Continuous revision of BCP and reinforcement of preemptive response (review of inventory levels, study of multiple suppliers/sites, etc.)
	Rise in temperature	“Human” production risks • Deterioration of working environment and productivity at construction sites	• Promotion of industrialization and utilization of IT in housing construction • Promotion of heatstroke countermeasures at construction sites
+1.5°C scenario	Decarbonization	• Rise in costs due to stricter regulations (manufacturing and raw material costs) • Changes in materials needs (decarbonization requirements, necessary specifications)	• Expansion in utilization of renewable energy, etc. • More efficient energy use; development and commercialization of industrial processes for decarbonization • Decarbonization of raw materials • Acceleration of product decarbonization by ascertaining carbon footprints ⁵
	Changes in market structure	• Contraction of existing markets due to the transition to a circular economy • Contraction of existing markets due to the advance of replacement technologies	• Development of material and chemical recycling technologies and promotion of their practical application • Adoption of biomass feedstock • Review of management resource allocation

Opportunities	Important Changes	Main Opportunities	Major Initiatives
+4°C scenario	Serious storm and flood damage	• Increase in need for disaster-resilient housing	• Greater emphasis on resilience in home construction and urban development, such as the expansion of Hebel Haus™ and Hebel Maison™
	Increase in heatstroke and infectious diseases	• Expansion in demand for existing and new pharmaceuticals and acute critical care products	• Provision of related pharmaceuticals and medical devices • Provision of related process materials, equipment, and services
+1.5°C scenario	Decarbonization	• Promotion of the spread of ZEH ⁶ and ZEH-M ⁶ through government policies • Expansion in demand for carbon-free products	• Decarbonization of homes and urban environments through the expansion of ZEH-compliant Hebel Haus™ and Hebel Maison™ • Promotion of the low carbonization of various products (energy, materials, processes) • Development of chemicals made with CO ₂ as material
	Spread of electric vehicles (EVs)	• Increase in EV-related demand (battery components, materials for reducing vehicle weight)	• Development of materials for next-generation mobility • Strengthening of collaboration with automobile and battery manufacturers
	Advent of a hydrogen society	• Increase in demand for water electrolysis using renewable energy	• Development of a system to manufacture green hydrogen and promotion of its commercialization
	Transition to a circular economy	• Expansion in demand for materials and infrastructure compatible with a circular economy	• Development of material and chemical recycling technologies and promotion of their practical application • Adoption of biomass feedstock
	Expansion of the digital market	• Growth in demand for decarbonization-related digital solutions (industry and society)	• Promotion of electronic components, such as current sensors and CO ₂ sensors, and semiconductor- and substrate-related electronic materials businesses

⁵ GHG emissions of a product from material extraction to production

⁶ Net Zero Energy House (ZEH) and Net Zero Energy House Mansion (ZEH-M): Houses and apartment buildings with a net energy consumption of zero or less through advanced insulation and energy saving combined with power generation such as solar

Risk Management

Asahi Kasei implements independently assured tracking of its GHG emission volumes on an annual basis. The Sustainability Committee and its subcommittee the Global Environment Committee share information on the results and the level of progress toward achieving targets and discuss future initiatives. The committees also monitor the level of GHG emission reductions, examine business strategies, and report to the Board of Directors during the formulation and annual review of the MTP. In addition, the committees monitor related matters on a quarterly and monthly basis. For capital expenditures examined and proposed as needed, the committees also assess profitability and make decisions in light of internal carbon pricing.

Overview of the Group's Response to Climate Change

Metrics and Targets

The Asahi Kasei Group has positioned the following metrics as being relevant to climate change risks and opportunities.

	Target	Significance of Metric
GHG emissions ⁷	2030: Reduce by 30% or more (compared with fiscal 2013) 2050: Achieve carbon neutrality	
GHG emissions ⁷ /operating income	(Fiscal 2021 result: 0.20 t-CO ₂ e/100 million yen)	Decline signifies reduction of carbon tax risk
ROIC	Around 2030: Achieve ROIC of 10% or more	Increase indicates progress toward becoming a high-earnings enterprise capable of adapting to change
Operating income of GG10	Around 2030: 70% or more of total operating income (Fiscal 2021: 35%)	Signifies growth of related businesses capable of contributing to addressing climate change
Others		
Internal carbon pricing (ICP)	Make investment decisions based on ¥10,000/t-CO ₂ e and utilize in awards program	
Reflection of climate change issues in executive remuneration	Reflect the level of achievement of sustainability promotion, including initiatives related to climate change, in performance-linked remuneration	

⁷ Direct GHG emissions from business activities as indicated by Scope 1 (direct GHG emissions) and Scope 2 (indirect GHG emissions from use of electricity, heat, and steam supplied by other companies)

Various scenarios in the event of climate change progressing

From curtailing temperature rises through government policies and social changes to intense heat, flood damage, and ecosystem destruction, etc., through failure to curtail temperature rises

