

**TCFD**

*Task Force on Climate-related Financial Disclosures*

**Report 2022**

# SEKISUI CHEMICAL Group's Responses to Climate Change (2022) Information Disclosure Based on the Recommendations by the TCFD

## Table of Contents

Executive Summary	p. 2-3
List of Initiatives to Address Climate Change	p. 4
1 Commitment to Actions	p. 5-7
1-1. Positioning of Climate Change Issues	
2 Governance	p. 8-11
2-1. The Board of Directors' Supervisory Structure and the Roles of Directors in Assessing and Managing Risks and Opportunities Related to Climate Change Issues	
2-2. Monitoring and incentives on progress of action plans, target values, etc. on climate change issues	
3 Risk Management	p. 12-14
3-1. Integrated Risk Management, Including Climate Change	
3-2. Assessment and Management of Risks and Opportunities Related to Climate Change	
<Assessment and Management of Business Risks, Including Climate Change>	
<Assessment and Management of Opportunities Obtained through Climate Change>	
4 Strategies	p. 15-33
4-1. Awareness of Risks and Opportunities	
<Impact Analysis of Climate Change Risks>	
4-2. Scenario Analysis (Risks and Opportunities)	
<Methodologies and Results of Scenario Analysis>	
<Summary of Scenario Analysis>	
4-3. Validation of Climate Change Strategies	
<Monitoring Carbon Efficiency (Environmental Performance)>	
<Correlation Between Carbon Efficiency and Economic Performance>	
<Stakeholder Comprehensive Income Using Impact-Weighted Accounting>	
<Summary of Validity Confirmation>	
4-4. Impacts of Risks and Opportunities Related to Climate Change on the Organization's Businesses, Strategies, and Financial Planning	
<Impacts of Climate Change on Businesses and Strategies>	
<Impacts of Climate Change on Financial Planning>	
5 Indicators and Targets	p. 34-43
5-1. Indicators for Assessing Risks and Opportunities Related to Climate Change	
5-2. Net Sales of Products to Enhance Sustainability	
5-3. Greenhouse Gas Emissions (SCOPE 1, 2, and 3)	
6 In Closing	p. 44

This report discloses SEKISUI CHEMICAL Group's (herein after 'Group') responses to climate change issues based on the recommendations by the TCFD. The report is updated with new responses in 2022, based from the disclosures made last year. The major revisions are as follows.

- Reaffirming risk analysis by scenario analysis assuming a 1.5°C scenario (see "4. Strategies")
- Reaffirming management structure for evaluating expansion of stakeholder comprehensive income related to climate change using impact-weighted analysis (See "4. Strategies, 4-3. Validation of Climate Change Strategies")
- Reaffirming strategies and measures from a bird's-eye view, taking into account correlations between climate change and other environmental issues (resource circulation, water risks, and biodiversity (aspects of nature)) (See "5. Indicators and Targets")

Commitment to Actions	In the SEKISUI CHEMICAL Group long-term vision, " <b>Vision 2030</b> ", climate change issues are recognized as key issues, and initiatives are implemented based on strategies to accelerate those issues through the Group's businesses.
Governance	The Board of Directors makes the final decision on policies and strategies for mitigating negative impacts related to climate change and expanding the Group's contributions toward solving issues related to climate change. The Board also gives the final approval for policies for transition plans and understands the responses to the effects of businesses on climate change. The main issues deliberated and decided by the Board of Directors are discussed and summarized by the Environment Subcommittee, and the Sustainability Committee deliberates policies and strategies based on company-wide situations regarding climate change. In addition, based on the policies, strategies, and transition plans finalized by the Board of Directors, the Environmental Subcommittee discusses specific measures, goal setting, and manages progress.
Risk Management	<p>In the Group's risk management activities, an ERM<sup>*1</sup> structure is established to identify "serious Group-wide incidents" which are shared and managed throughout the Group. Risks related to climate change are summarized and assessed by the Environmental Subcommittee, and then reported to the Group-wide Risk Review Subcommittee together with other risks that are assumed to have a significant impact on management, and collectively reviewed. Group-wide risks, and risks identified by each organization, both including climate change, are shared and deliberated by the Board of Directors, the Sustainability Committee, internal management meetings, and each Subcommittee. The Board of Directors shares that risks related to climate change are important external environmental risks, and formulates medium-term environmental plans by considering countermeasures and initiatives when formulating management plans as medium to long term strategies.</p> <p><sup>*1</sup> ERM; Enterprise Risk Management. This refers to a Group-wide mechanism and process for Group-wide, integrated risk management and risk management activities.</p>
Strategies	<p>■ Scenario analysis</p> <p>Scenario analyses were conducted to identify potential risks and opportunities that could arise from climate change, and it was confirmed that strategies to reduce risks or to convert risks into opportunities are in place for all scenarios assumed. The scenario analyses also reaffirmed the effectiveness of the strategies as a solution to the issues related to climate change. Based on the 1.5°C scenario and the 4°C scenario, two axes were set; one axis is whether</p>

climate change mitigation progresses or not; and the other axis is decentralization of social systems in rural area or concentration in large cities. Four climate change scenarios were envisaged taking into account the mutual impact of other environmental issues with climate change issues. Recognizing that environmental issues such as resource circulation, water risk, and biodiversity are related to climate change issues, measures from a broader perspective were reaffirmed. Strategies to re-establish milestones and accelerate efforts to realize a carbon-free society were reviewed in each scenario, while examining the validity of these strategies. Activities will continued to be promoted based on the current medium-term management plan, which reflects the climate change strategies, with the aim of realizing a carbon-free society. At the same time, a transition plan will be implemented that accelerates efforts in the formulation of the next management plan starting next fiscal year.

#### ■ Validity of the strategies

The following verification were conducted to confirm that the Group's strategies to address climate change issues were appropriate.

- (1) Improvements in carbon efficiency (environmental performance)
- (2) Correlation between carbon efficiency and economic performance
- (3) Calculation of Stakeholder Comprehensive Income using impact-weighted accounting techniques

As a result of converting the contribution to reduction of greenhouse gas emissions and products that contribute to resolving climate change issues into economic values, it was confirmed that stakeholder comprehensive income, which takes into account the impact of climate change issues on net income, more than doubled compared to 2016. Going forward, initiatives using ESG investment framework in financial planning are planned so that environmental value can be expanded while achieving both economic and environmental performance.

#### Indicators and Targets

Milestones are set by backcasting from the long-term goals of "SEKISUI Environment Sustainability Vision 2050" vision, and have established the medium-term environmental plan "Environment Sustainability Plan: Accelerate II". In this plan, the following two indicators are set to manage progress on climate change.

- 1) Net sales of Products to Enhance Sustainability\*2
- 2) Greenhouse gas emissions (SCOPE 1, 2, and 3)

In fiscal year (FY) 2021, net sales of Products to Enhance Sustainability was 772.4 billion yen and achieved the target of 750 billion yen. Of these, sales of products that contribute to resource recycling totaled 360.4 billion yen, of which sales of products that contribute to resource conversion of raw materials to resources totaled 45.3 billion yen. Targets on resource recycling strategies was achieved and efforts on decarbonizing product are accelerating.

Regarding greenhouse gas emissions, the Group's business activities achieved the reduction targets, but reduction targets for the supply chain could not be achieved.

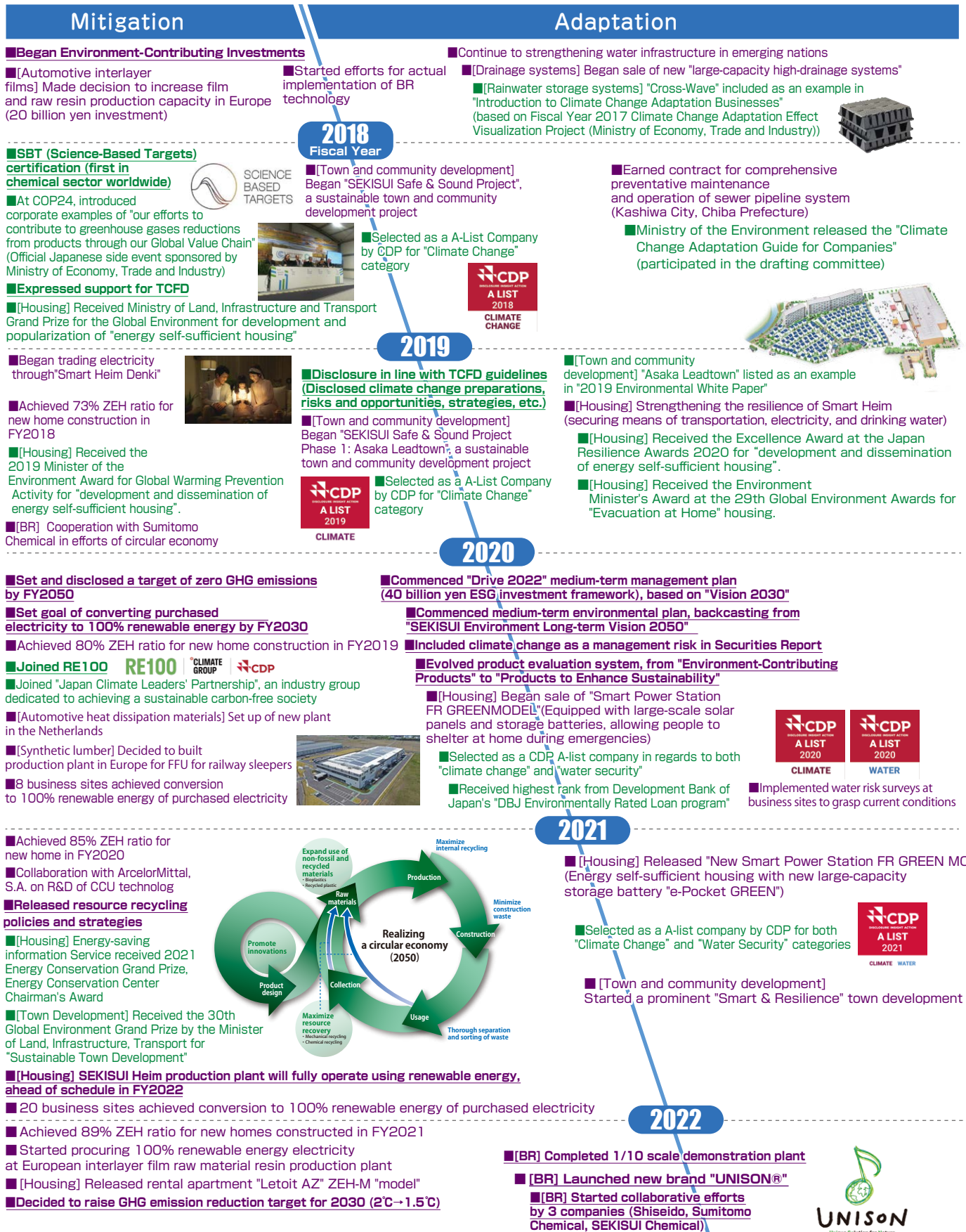
\*2 Products to Enhance Sustainability System:

A system that certifies and registers products that contribute significantly to solving environmental and social issues (including climate change issues), under in-house standards. Products are reviewed by a certification committee composed of in-house members to determine whether they meet the registration criteria. Also, the committee receives advice from the external advisory board to ensure high standards and transparency.

## List of Initiatives to Address Climate Change

# Recent SEKISUI CHEMICAL Group Mitigation and Adaptation Initiatives

■ : Internal policies or business development  
■ : Stakeholder Related Initiatives (External Evaluations, etc.)





## [Overview]

In the SEKISUI CHEMICAL Group long-term vision, **"Vision 2030"**, climate change issues are recognized as key issues, and initiatives are implemented based on strategies to accelerate those issues through the Group's businesses.

## 1-1. Positioning of Climate Change Issues

SEKISUI CHEMICAL Group recognizes that climate change issues exist while mutually affecting various other environmental issues, and is working to solve environmental issues comprehensively. The Group defines the key environmental issues as "climate change," "water risk," and "resource recycling" which are to be addressed in the medium-term environmental plan (2020-2022). It is recognized that the efforts to address these three environmental issues are not only important to business, but they are also important initiatives that will lead to the realization of "an earth where biodiversity is maintained" advocated in the long-term environmental vision.

In addition, in order for the Group to thoroughly and quantitatively identify and manage its efforts to address environmental issues, LIME2 and impact-weighted accounting are used to visualize the relationship between environmental factors and quantify the results of those efforts.

## [Long-term Vision]

SEKISUI CHEMICAL Group has set its vision statement as "In Innovation for the Earth" and is strongly committed to create innovations "in order to realize sustainable society, we support the basis of LIFE and will continue to create 'peace of mind for the future'" (Fig. 1). Focusing on innovations and creativity centered on ESG management, both "expansion of existing businesses<sup>\*3</sup> by acquiring products and businesses" and "creation of new businesses by creating and acquiring new business foundations" will be achieved; and through

innovations, contributions to solving social issues will be made more than ever. Through this cycle, the vision of doubling the Group's business (net sales of 2 trillion yen, operating profit margin of 10% or more) in 2030 is targeted.

<sup>\*3</sup> Four business domains: residential (houses), advanced lifeline (social infrastructure), innovative mobility (electronics / mobility), and life science (health / medical)

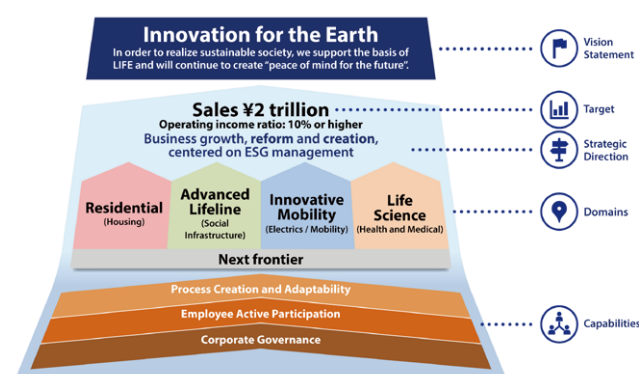


Figure 1: SEKISUI CHEMICAL Group's long-term vision **"Vision 2030"**

## [Performance Indicators]

In the long-term vision, two indicators have been established to measure economic values and social values. These indicators are based on that sustainable management is necessary to continuously expand the degree of contribution to solving issues and earnings. One of these is the "SEKISUI Sustainable Spread". It measures the ability to sustain management by reducing the cost of capital, which is an important issue in ESG management and improving efficiency through improving ROIC. The second is the "SEKISUI Environmental Sustainability Index"<sup>\*4</sup>, which expresses the value of corporate activities on natural capital and social capital as the degree of contribution to solving issues (impact on the earth and society).

The goals of the "SEKISUI Sustainable Spread" are to continuously improve ROIC, which indicate the efficiency of business management over the medium term, and to lay the groundwork for a management foundation that enhances the long-term sustainability of management.

Regarding the "SEKISUI Environmental Sustainable Index", SEKISUI CHEMICAL Group believes that by continuing to aim for an index value of 100% or more, and by doubling our business and continuing further growth, will expand the social value of the Group.

\*4 SEKISUI Environmental Sustainability Index: Index showing the impact of SEKISUI CHEMICAL Group's corporate activities on the use of natural capital and the contribution of corporate activities to natural capital, and is calculated using the Japanese version of Damage Evaluation Methodology "LIME2." As of FY2020, the impact and contribution to social capital is also be included in the calculation.

#### [Medium-Term Management Plan and Important Issues to be Addressed]

SEKISUI CHEMICAL Group has formulated **"Drive 2022"**, a three-year medium-term management plan covering the period from FY2020 to FY2022, as the first step to achieve its long-term vision. The basic policy is to "double the business by contributing to solving of social issues, by putting a drive on sustainable 'growth', 'reformation', and 'preparation'", with the aim of solidifying the management foundation through full-scale implementation of ESG management and accelerating the preparation for the next stage of growth. Governance, digital transformation (DX), environment, human resources, and fusion are ESG foundations that are considered to be important.

Based on the results of scenario analyses

conducted by the recommendation of the TCFD, climate change issues are recognized to have significant short to long-term business impacts, risks, and opportunities. In response, climate change mitigation and adaptation are identified as one of the key issues to be addressed in order to achieve the long-term vision. With regard to initiatives to address important ESG management issues, including climate change, an ESG investment framework has been established and will conduct strategic management from a long-term perspective.

#### [Long-Term Targets for Environmental Issues]

"Mitigation and Adaptation to Climate Change" are one of the most important environmental issues, and the mid-term environmental plan "SEKISUI Environment Sustainability Plan - Accelerate II" was formulated and considers what initiatives need to be implemented in the mid-term by backcasting from the target set for 2050. The direction for 2050, with regards to environmental issues including climate change, is outlined in Figure 2.

Vision of the earth by SEKISUI CHEMICAL Group in 2050 is "an earth where biodiversity is maintained" where many issues have been solved and biodiversity is preserved in a healthy condition. Recognizing that business activities rely on the natural and social capital of the planet, three activities contribute to the return of the natural and social capital; (1) expand and

create markets for “products to enhance sustainability”, (2) reduce environmental impacts, and (3) conserve the natural environment. These activities contribute to solving global issues such as climate change, resource circulation, water risks, and biodiversity (see Fig. 3). In addition, in

order to accelerate the Group’s contribution to returns, initiatives will be promoted by not only the Group but also in collaboration with its stakeholders (see Fig. 2).



\*Stakeholders: "Customers", "Shareholders", "Employees", "Business partners", "Local Communities and the Environment"

Figure 2: Direction of Environment for 2050: "SEKISUI Environment Sustainability Vision 2050"

- Promote innovation contributing to low carbon and decarbonization
- Reduce energy consumption in manufacturing (Energy consumption innovation)
- Use electricity from renewable sources
- Convert purchased electricity to renewable energy (energy procurement innovation)
- Reduce SCOPE 3 emissions by cooperation from supply chain
  - Purchased products & services (main resins)
  - Reduce GHG emissions in use of sold products (houses)
- Expand GHG reduction contributed by products in life cycle

#### Roadmap for GHG Reduction

- Expanded use of non-fossil-derived & recycled materials
- Promote innovation that contributes to resource recycling
- Maximize the material recycling rate

#### Roadmap for Resource Recycling



- Minimize risks of business sites with large business impact
- Minimize risks of suppliers with large business impact
- Minimize risks of business sites where water risks are significant in the local area
- Promote innovations that contribute to solving local water issues and minimize the environmental impact on the supply chain

#### Roadmap for achieving a society with abundant clean water

- Minimize chemical substance effects by reducing chemical substance emissions & transport
- Suppress VOC emissions
- Prevent air and water pollution
- Soil pollution countermeasures

- Improve quality of green space in factories (using Land Use Score Card®)
- Support R&D that utilizes knowledge learned from nature in manufacturing (Innovation Inspired by Nature Research Support Program)

- Education to enhance abilities to contribute to solving social issues
- SDGs contribution activities (environment, next generation, local community)

Figure 3: Efforts on Environmental Issues



**[Overview]**

The Board of Directors makes the final decision on policies and strategies for mitigating negative impacts related to climate change and expanding the Group's contributions toward solving issues related to climate change. The Board also gives the final approval for policies for transition plans and understands the responses to the effects of businesses on climate change. The main issues deliberated and decided by the Board of Directors are discussed and summarized by the Environment Subcommittee, and the Sustainability Committee deliberates policies and strategies based on company-wide situations regarding climate change.

In addition, based on the policies, strategies, and transition plans finalized by the Board of Directors, the Environmental Subcommittee discusses specific measures, goal setting, and manages progress.

## **2-1. The Board of Directors' Supervisory Structure and the Roles of Directors in Assessing and Managing Risks and Opportunities Related to Climate Change Issues**

Under the supervisory structure of the Board of Directors, the magnitude of risks are recognized, appropriate measures are considered, and decisions to implement external environmental issues that may pose management risks such as climate change are made. In order to mitigate the impact on climate change to the Group and expand contribution to solving climate change-related issues, SEKISUI has been responding with the governance structure shown in the figure below.

**Board of Directors:**

Receives reports on Group-wide risks, policies, and strategies deliberated by the Sustainability Subcommittee, and makes final decisions. Oversees execution of initiatives related to sustainability.

**Sustainability Committee:**

Deliberates policies, strategies, and major measures for improving social sustainability and the Group's sustainability, including contributing to solving climate change-related issues. Furthermore, Group-wide risks, including risks related to climate change, are evaluated, identified, and deliberated.

**Environmental Subcommittee:**

Executive officers and responsible managers in charge of divisional companies and corporate headquarters participate in the discussions and manage the progress of implemented strategies and targets set related to climate change aligned with business strategies.

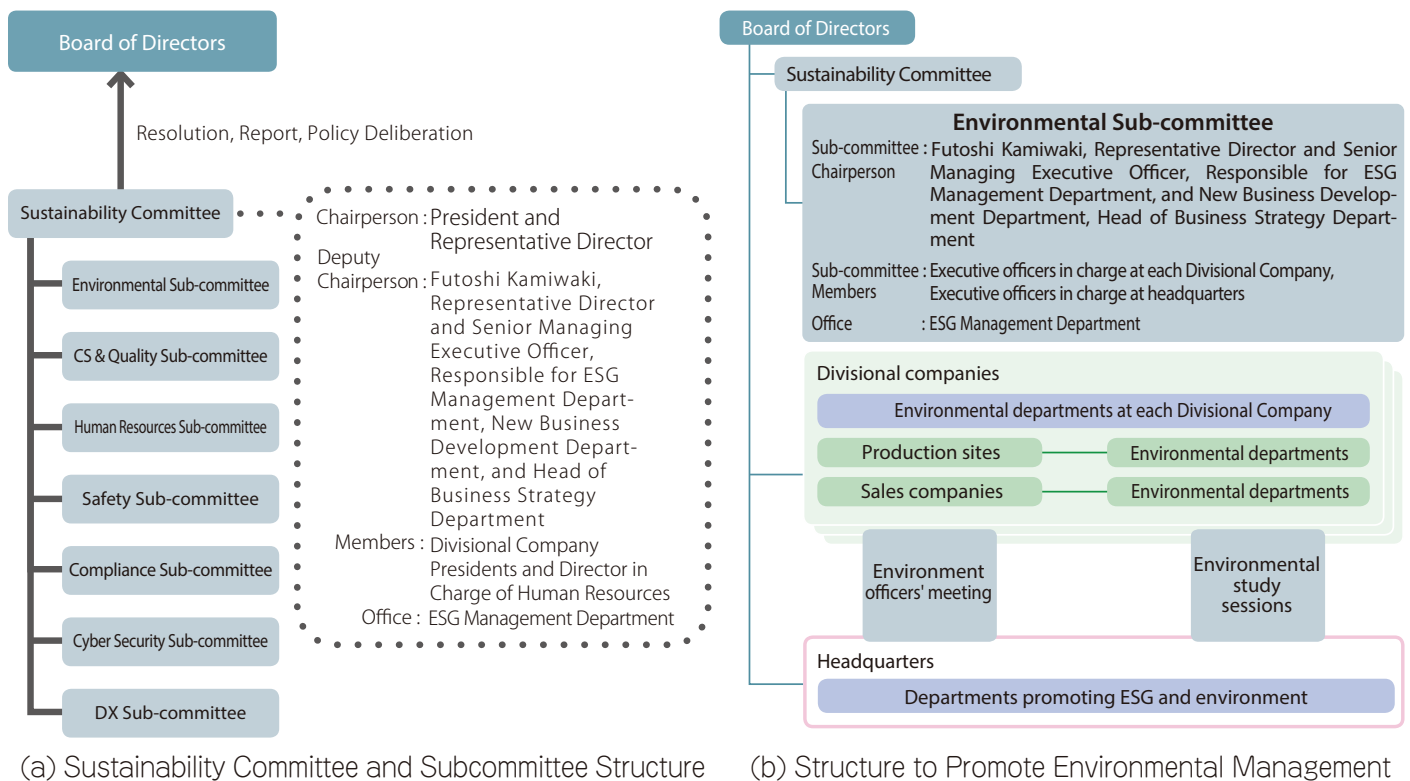


Figure 4: Governance Structure on Climate Change Issues

[Reference] Agenda Related to Climate Change of the Board of Directors and Management Meetings

· Initiatives for managing supply chain and application for SBT certification:	August 2017: Management Meeting September: Environmental Subcommittee Meeting
· Commitment to support the TCFD:	November 2018: Management Meeting
· Policy to convert purchased electricity to 100% renewable energy by FY2030:	November 2019: Management Meeting
· Medium-Term Management Plan including ESG investment framework:	May 2020: Board of Directors Meeting
· Disclose initiatives in the Annual Security Report:	June 2020: Board of Directors Meeting
· SEKISUI CHEMICAL Group's FY2021 ESG Management Business Plan:	December 2020: Sustainability Committee
· FY2021 Guidelines on ESG Management Plan, including climate change:	January 2021: Management Meeting
· Policies on GHG reductions and use of renewable energy:	February 2021: Management Meeting
· Policies and strategies on resource recycling:	March 2021: Management Meeting
· Disclose initiatives in the Annual Security Report:	June 2021: Board of Directors Meeting
· FY 21 Second Half Business plan and monitoring progress of ESG management of divisional companies:	October 2021: Board of Directors Meeting
· SEKISUI CHEMICAL Group's FY2022 ESG Management Business Plan:	December 2021: Sustainability Committee
· FY2022 Guidelines on ESG Management Plan, including climate change:	January 2022: Management Meeting
· Annual business plan and monitoring progress of ESG management of divisional companies:	April 2022: Board of Directors Meeting
· Disclose initiatives in the Annual Securities Report (Risks for businesses, etc.):	June 2022: Board of Directors Meeting
· Strategies for raising GHG reduction targets by 2030:	June 2022: Management Meeting
· Strategies for raising GHG reduction targets by 2030:	July 2022: Board of Directors Meeting

## **2-2. Monitoring and incentives on progress of action plans, target values, etc. on climate change issues**

The progress of the action plans including the transition plans for climate change and the target values are managed by the Environmental Subcommittee held twice a year with the participation of the officers in charge of the divisional companies and headquarters. The target values and actual values summarized by the Environmental Subcommittee are reported to the Sustainability Committee and the Board of Directors. In addition, various measures to achieve the targets are incorporated into the action plans of each divisional company, and a system is in place where the Board of Directors monitors progress every April and October.

Climate change is regarded as the most important issue for "environment", which is an important issue in ESG management of the Group. To promote the conversion of purchased electricity to renewable energy in order to reduce greenhouse gases, the "ratio of renewable energy from purchased electricity" is set as a Group-wide KPI. The progress is reflected as bonuses for management and some managers.

The Management Meeting in June 2022 and the Board of Directors Meeting in July made management decisions to raise the greenhouse gas reduction target for 2030 to the 1.5°C target. In the next medium-term management plan, a strategy will be formulated to accelerate toward the realization of carbon neutrality in 2050.



**[Overview]**

In the Group's risk management activities, an ERM<sup>\*1</sup> structure is established to identify "serious Group-wide incidents" which are shared and managed throughout the Group. Risks related to climate change are summarized and assessed by the Environmental Subcommittee, and then reported to the Group-wide Risk Review Subcommittee together with other risks that are assumed to have a significant impact on management, and collectively reviewed. Group-wide risks, and risks identified by each organization, both including climate change, are shared and deliberated by the Board of Directors, the Sustainability Committee, internal management meetings, and each Subcommittee. The Board of Directors shares that risks related to climate change are important external environmental risks, and formulates medium-term environmental plans by considering countermeasures and initiatives when formulating management plans as medium to long term strategies.

<sup>\*1</sup> ERM; Enterprise Risk Management. This refers to a Group-wide mechanism and process for Group-wide, integrated risk management and risk management activities.

### 3-1. Integrated Risk Management, Including Climate Change

SEKISUI CHEMICAL Group promotes a risk management structure that integrates activities to prevent the occurrence of risks (Enterprise Risk Management: ERM) and activities to respond when risks occur (Crisis Management). This integration has created a mechanism that can adapt to the ever-changing risk crisis according to the situation of the organization. (Fig. 5)

In risk management including climate change, risk information is comprehensively collected for the specialized area and overseas areas, and assessed on two axes of "likelihood" and "consequences". Based on the results, the Group-wide Risk Assessment Subcommittee, in which managers from each specialized area participate, conducts a unified assessment and identifies serious Group-wide risks. Climate change-related risks are summarized and assessed by the Environmental Subcommittee and then reported to the Group-wide Risk Review Subcommittee. Significant risks are reported to the Sustainability Committee, which is chaired by the president and sub-chaired by the executive director in charge of the ESG Management Department, who also serves as

the general manager of the Corporate Business Strategy Department. The committee is composed of the presidents of the divisional companies and deliberates along with Group-wide response policies, major measures, and target achievement levels. The deliberations in the Committee are then reported to the Board of Directors, which are identified as serious risks. Response policies and main measures are then finalized. The identified Group-wide critical risks and their Group-wide countermeasures, as well as major initiatives, are reported to each subcommittee, including the Environmental Subcommittee, in which the directors in charge in the divisional companies and headquarters and the persons in charge of implementations participate, and are incorporated into action plans as Group-wide common measures and divisional company-specific measures. An ERM system is also being promoted that integrates Group-wide risk management activities with activities of individual organizations by reflecting them in organizational risk management activities by 173 organizations, including domestic and overseas affiliated organizations.

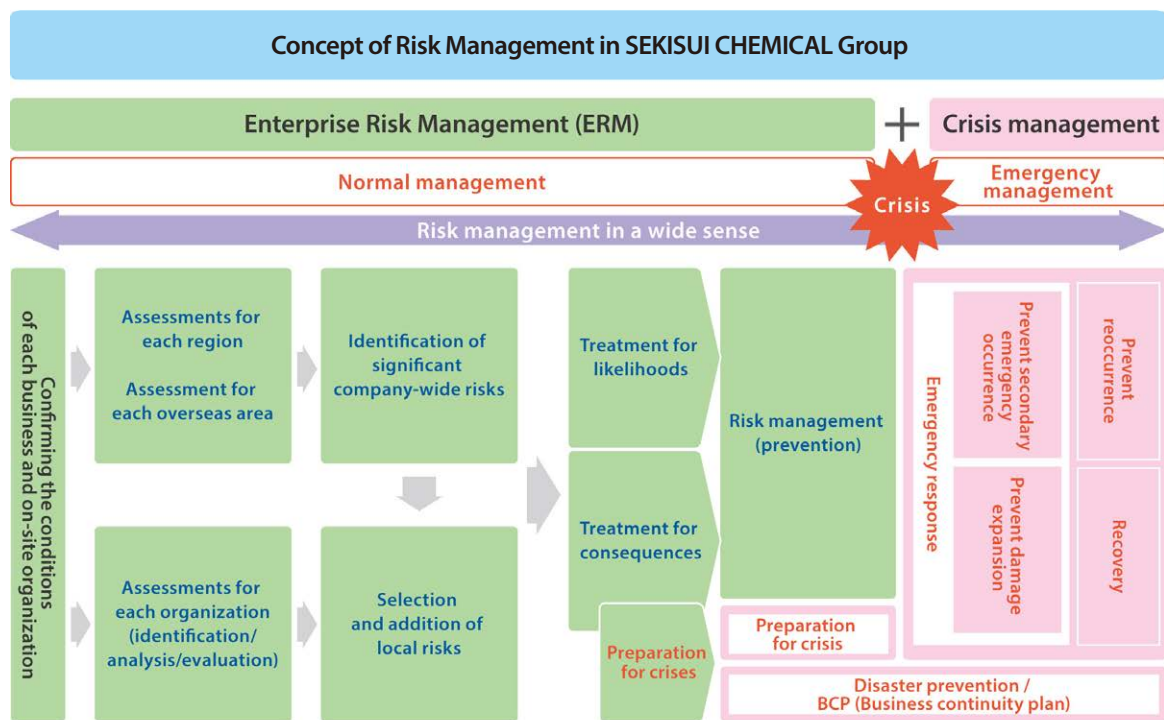


Figure 5: SEKISUI CHEMICAL Group's Risk Management System

### 3–2. Assessment and Management of Risks and Opportunities Related to Climate Change

As for climate change, considerations are given as to what can be done to recognize risks and opportunities, and to reduce the risks and transition them into opportunities. Recognizing that climate change is endorsed by the Board of Directors as an important external environmental risk, and when considering the management plan, countermeasures and initiatives as strategies for the medium- to long-term are considered and formulates a medium-term environmental plan. Based on the indicators and targets established to promote this plan for risks related to climate change initiatives are considered to address climate change issues through a PDCA cycle.

The following is a description of the current status and future of the assessment and management of business risks, including climate change, and the assessment and management of opportunities obtained through climate change.

#### <Assessment and Management of Business Risks, Including Climate Change>

In recent years, there has been a need to

accelerate measures to mitigate and adapt to climate change issues and to strengthen risk assessments from a longer-term perspective. Accordingly, since FY2019, risk assessments have been conducted through scenario analysis. FY2019-2020: adopted 2°C and 4°C scenarios. FY2021 and forward: adopted 1.5°C and 4°C scenarios.

In FY2021, acceleration was demanded to realize a carbon-free society. In order to re-strategize, for example, by reviewing the 2030 milestone, a 1.5°C scenario was assumed as a mitigation scenario, and a re-analysis was conducted.

As a result, risks shown in the next chapter were identified (Table 1). Following a re-analysis of the scenario with the updated assumptions, the measures and business strategies necessary for acceleration were again confirmed. These matters will be reflected in the formulation of the next medium-term management plan and the mid-term environmental plan, which will be launched in the FY2023.

### <Assessment and Management of Opportunities Obtained through Climate Change>

Opportunities obtained through climate change, as with opportunities obtained through solving other environmental issues and social issues, are examined at the Products to Enhance Sustainability Certification Committee\*<sup>5</sup> meetings and the External Advisory Board\*<sup>6</sup> meetings. Discussions with internal committee members and external experts on what contributions can be made with the products and services of the Group, has provided insight into strategies that transform risks into opportunities. These business opportunities are listed in Chapter 4 (Table 2). These contents are shared with the relevant organizations through executive officers or persons in charge of the organization responsible for business planning and technological development at each divisional company as necessary, and are utilized in formulating business strategies.

In FY2021, strategies regarding resource circulation were made, which is one of the important initiatives for the decarbonization strategy, and a road map was released. As shown in the roadmap, it is important to create products that contribute to resource recycling and expand the market, especially to accelerate efforts to convert the plastic, which is the main raw material for the products, into non-petroleum-derived or recycled raw materials.

For this reason, the contribution of existing products to resource recycling issues were reconfirmed, and in-house criteria for "Products to Enhance Sustainability" have been

established so that future product designs can be further considered.

In the Products to Enhance Sustainability system, which evolved from the Environment-Contributing Products in FY2020, a "premium" category has been set for confirming sustainability and expanding strategically. It is not only necessary to increase contribution at this point, but also improve the sustainability of the Group itself and products, in order to make high contributions to solving issues, such as climate change, sustainable. Going forward, as the KPI for this medium-term management plan and the mid-term environmental plan, evaluations are conducted to see whether opportunities are realized by managing the progress of products that contribute to sustainability.

\*5 Certification committee:

A meeting to certify products that have a high degree of contribution in solving environmental and social issues based on in-house standards. Committee members are executive officers and other members in charge of key to businesses or technologies, as the certification.

\*6 External Advisory Board:

A meeting chaired by the executive office in charge of ESG Management Department and is attended by five external experts and the members of the Certification Committee. In the meeting, opinions on the registration of products to enhance sustainability are exchanged, and it has been continuing since FY 2020.

**[Overview]****■ Scenario analysis**

Scenario analyses were conducted to identify potential risks and opportunities that could arise from climate change, and it was confirmed that strategies to reduce risks or to convert risks into opportunities are in place for all scenarios assumed. The scenario analyses also reaffirmed the effectiveness of the strategies as a solution to the issues related to climate change.

Based on the 1.5°C scenario and the 4°C scenario, two axes were set; one axis is whether climate change mitigation progresses or not; and the other axis is decentralization of social systems in rural area or concentration in large cities. Four climate change scenarios were envisaged taking into account the mutual impact of other environmental issues with climate change issues. Recognizing that environmental issues such as resource circulation, water risk, and biodiversity are related to climate change issues, measures from a broader perspective were reaffirmed. Strategies to re-establish milestones and accelerate efforts to realize a carbon-free society were reviewed in each scenario, while examining the validity of these strategies. Activities will continued to be promoted based on the current medium-term management plan, which reflects the climate change strategies, with the aim of realizing a carbon-free society. At the same time, a transition plan will be implemented that accelerates efforts in the formulation of the next management plan starting next fiscal year.

**■ Validity of the strategies**

The following verification were conducted to confirm that the Group's strategies to address climate change issues were appropriate.

- (1) Improvements in carbon efficiency (environmental performance)
- (2) Correlation between carbon efficiency and economic performance
- (3) Calculation of Stakeholder Comprehensive Income using impact-weighted accounting techniques

As a result of converting the contribution to reduction of greenhouse gas emissions and products that contribute to resolving climate change issues into economic values, it was confirmed that stakeholder comprehensive income, which takes into account the impact of climate change issues on net income, more than doubled compared to 2016.

Going forward, initiatives using ESG investment framework in financial planning are planned so that environmental value can be expanded while achieving both economic and environmental performance.



## 4-1. Awareness of Risks and Opportunities

### <Impact Analysis of Climate Change Risks>

A number of international institutions have formulated multiple climate change scenarios predicting what may occur over the next 100 years. The United Nations IPCC (Intergovernmental Panel on Climate Change) Fifth and Sixth Assessment Reports have been used to identify the risks that climate change

poses to the Group and its businesses and to identify strategies to prepare for long-term risks. This year, the scenario of a society in which climate change mitigation has progressed from was changed from the 2°C scenario to the 1.5°C scenario, and conducted the analysis again (see Table 1).

Table 1: Climate Change Scenarios

		Societies that have made progress in mitigating climate change	Societies that have failed in mitigating climate change
Reference scenarios	Transition scenarios	IEA NZE2050 IRENA	–
	Physical climate scenarios	RCP1.9 SSP1	RCP8.5 SSP5
Temperature rise		Less than 1.5°C	4°C or higher
Heat waves and torrential rains		Less extreme weather events	Many extreme weather events
Socio-economic trends		A world of growth and equality with a focus on sustainability	A world of rapid and unlimited growth in economic output and energy consumption
Energy transformation		Energy transformation will reduce GHG emissions by 70% in 2050	–
Economic events		Increasing Carbon Prices Increasing Fuel Prices	–
Risks	Regulatory risks	Large	Small
	Physical risks	Small	Large

Based on the climate change scenarios set, impacts of climate change risks were analyzed and strategies were considered to prepare for long-term risks for each business domain. Scenarios are re-analyzed based on the primary assessments conducted by exchanging opinions with relevant departments, external experts, in-house and external think tanks. In the analysis, transition risks and physical risks were reconfirmed based on the two climate change scenarios, considering the size of sales, operating income, profit margins, and growth potential of the business domains (residential, advanced infrastructure, innovative mobility, life science, and energy as the next frontier) that will strategically be grown toward 2030.

Based on the 1.5°C and the 4°C scenario, analysis two axes were set: one is whether climate change mitigation progresses or not, and the other is decentralization of social systems in to rural areas or centralization to large cities. Using these two axes, and

considering their mutual influence, four climate change scenarios were envisaged.

Climate change and other environmental issues such as resource circulation, water risks, and biodiversity (aspects of nature) are interrelated and have causal relationships with each other (Fig. 6). For this reason, it is thought that it was necessary to analyze how the identified risks are related to each environmental issue from a bird's-eye view, and countermeasures were reconfirmed.

Table 2 shows the results of the risk impact analysis and integration of possible risks in each business domain. Negative impacts that have significant financial impacts to the Group are considered as risks, and positive impacts are seen as opportunities. In the 1.5°C scenario, social changes including the impact on other environmental issues, are expected to become more significant than the 2°C scenario. Taking this into consideration, each scenario is reset and analyzed.

If the solutions to the resource recycling issues are effective as the solutions to those above-mentioned issues, and if solutions take into consideration the impact on biodiversity, then it can be reconfirmed that there is a high

possibility that risks can be converted into opportunities, and that it is essential to promote innovations such as the development of new materials and technologies.

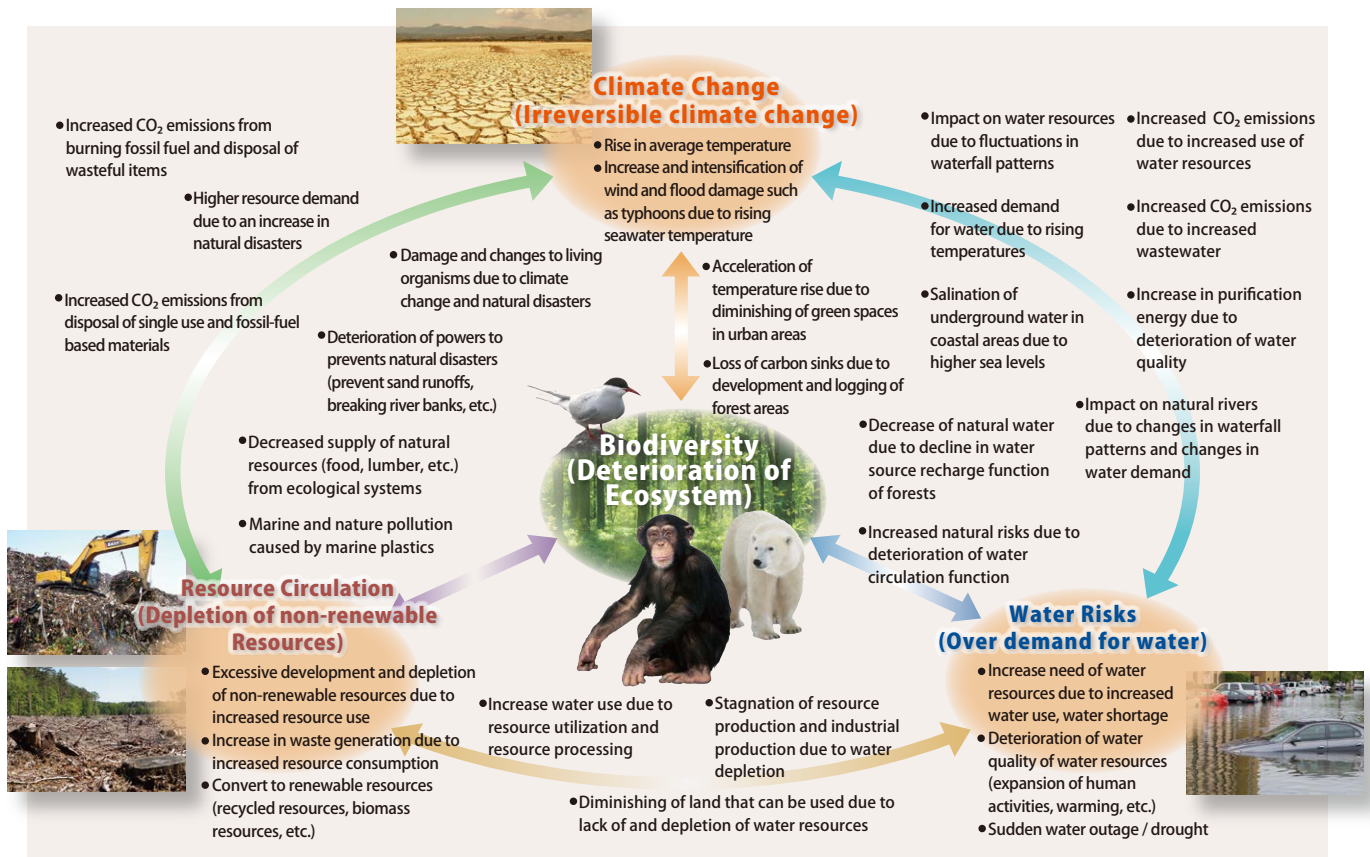


Figure 6: Correlation among Environmental Issues

Table 2: Results of Impact Analysis of Climate Change Risks

Green: New revisions in line with updating to the 1.5 °C scenario

Bold: Innovation-related items

						Correlation analysis of environmental issues			
Type	Climate change risks	Financial Impacts	Business risks	Business opportunities	Response / Actions by SEKISUI	Climate Change	Resource Circulation	Water Risks	Biodiversity
Transition	Policy regulations	Carbon tax increase	Large <Medium- to long-term> ·Increase in energy procurement costs ·Decrease in sales due to adding costs to product prices	<Medium- to long-term> ·Acquire business opportunities by differentiating through early response ·Stabilization of energy costs by introducing renewable energy	·Develop plans to promote converting purchased power to renewable energy, using ESG investment framework ·Improve effectiveness through public commitments such as SBT certification	Mitigation Mitigation	— —	— —	— —
		Regulations for energy savings/ low carbon	Large <Short-term> ·Increase in capital investment to strengthen energy conservation and renewable energy initiatives <Medium- to long-term> ·Increase in introduction costs for renewable energy certificates, etc.	<Short-term> ·Increased sales from energy conservation/storage/ creation businesses ·Increased sales from CO <sub>2</sub> -regulation compliant products	·Establish ESG investment framework (40 billion yen/3years) · <b>Develop new energy creation technologies (e.g., perovskite solar cells)</b> ·Review green procurement standards as appropriate ·Standardize housing with ZEH specifications	Mitigation Mitigation Mitigation Mitigation	— — All —	— — Business —	— — All —
		Policies	Large <Short-term> ·Increase in renewable energy procurement and waste treatment costs <Medium- to long-term> ·Lose market share from loss of differentiation due to mandating of low-carbon products such as ZEH ·Reduction of business opportunities due to stricter laws and regulations related to resource recycling	<Short-term> ·Increased need for technologies to reduce CO <sub>2</sub> during waste incineration <Medium- long-term> ·Increase in sales of new homes due to expansion of ZEH market due to from mandatory ZEH specs ·Expanding opportunities for horizontally recycled products such as in-house and industry-wide collection	· <b>Develop technology for creating ethanol from garbage (e.g., BR)</b> ·Use purchased power after FIT (e.g., Smart Heim Denki) ·Expand products that enhance sustainability · <b>Consideration of expanding horizontal recycling of in-house plastic products (e.g., KYDEX buyback system, etc.)</b> · <b>Development of services to improve the recycling value of housing products (e.g., Be-Heim)</b>	Mitigation Mitigation Both Mitigation Mitigation	Disposal — All Disposal Disposal	— — Products — —	Living organisms — All — —
		Litigations	Medium <Medium- to long-term> ·Lawsuits against companies using fossil fuels	<Medium- long-term> ·Increase in business opportunities due to consumer trust earned from commitments to society	·Disclose environmental vision and 2050 GHG emissions reduction targets ·Improve scores in various external benchmarking systems	Mitigation Both	All All	— All	— All
	Technologies	Replacement to low carbon products	Large <Short-term> ·Increase in re-certification costs due to change of low- carbon materials <Medium-term> ·Changeover to lower carbon materials and processes	<Short- to medium-term> ·Increase in business opportunities for products that enhance sustainability that contribute to low carbonization <Long-term> ·Business expansion through prioritized procurement of resource recycling friendly designed products	·Use of LCA in planning, development and marketing (CFP, environmental impact other than climate change) ·Use of "learn from nature" technologies and continuation of researcher subsidies ·Promotion of renewable energy in factories (e.g., Smart Heim Denki) ·Reduction of factory waste and acceleration of resource recycling · <b>Product development using bio-derived materials</b> · <b>Product development using recycled materials and increasing their use</b>	Mitigation Both Mitigation Mitigation Mitigation Mitigation	All All Manufacturing Manufacturing Raw materials Raw materials	— Products — — — —	All All — — Plants —
		Development of decarbonization technology	Large <Medium- long-term> ·Opportunity loss due to delay in introduction of decarbonization technologies	<Medium- long-term> ·Expand business opportunities by decarbonizing products ·Creation of new businesses utilizing decarbonization technologies	· <b>Development of CCU technologies in collaboration with different industries (e.g., collaboration with ArcelorMittal, S.A.)</b>	Mitigation	Disposal	—	—
	Markets	Change in consumer behavior	Medium <Long-term> ·Decrease in sale of new cars ·Opportunity loss due to inability to recycle resources and use decarbonization incentives	<Medium-term> ·Acquisition of incentives through resource recycling and visualization of decarbonized value <Long-term> ·Increase in profitability from shift to higher-performance products ·Expansion of market for ICT-related products	·Efforts to improve resource recycling value through industry collaboration (e.g., CLOMA (for marine plastic issues)) · <b>Development of highly heat resistant and durable, and other high performance products</b> · <b>Development of lightweight solar cells, heat dissipating products</b>	Mitigation Mitigation Mitigation	Use Use Use	— — —	Living organisms — —
		Market uncertainty	Medium <Long-term> ·Investments to stabilize power supply for dispersed renewable energies	<Long-term> ·Increase in sales of products to support a more dispersed society	·Sales of houses that realize energy self-sufficiency · <b>Development of resource recycling technologies (e.g., BR, mat'l waste recycle)</b>	Mitigation Mitigation	— Disposal	— —	Living organisms —
	Reputation	Changes in consumer preferences	Medium <Short- to medium-term> ·Sales decline due to inability to keep up with sustainable lifestyle preferences <Long-term> ·Decrease in sales due to increased preference for "sharing" over "owning"	<Short- to medium-term> ·Improve corporate brand and expand sales with products that support sustainable living <Long-term> ·Creation of new businesses to meet consumer preferences	·Promotion of sustainable town development business(e.g., ABINC certification of Asaka Lead Town) ·Begin services using housing big data (e.g., Smart Heim Denki)	Both Both	All All	Products Products	All All
		Industry criticism	Large <Medium- to long-term> ·Investor valuation decline for companies that do not decarbonize <Long-term> ·Decline in evaluation of companies that do not understand the biodiversity impact of decarbonization solutions	<Short- to medium-term> ·Secure stable financing by demonstrating compatibility with resource circulation <Long-term> ·Consideration of nature-positive decarbonization solutions and high evaluation for product development	·Use of renewable energy by purchasing electricity after FIT ·Promotion of reform and use of in-house system for planning and R&D (product environmental impact assessment) ·Promotion of efforts to reduce the impact of nature and information disclosure (e.g., use of Land Use Score Card®)	Mitigation Both Both	— — —	— — —	— All All
Physical	Acute	Frequent typhoons	Large <Short-term> ·Increase in damage such as plant shutdowns and sales decrease ·Increase in costs to control flooding and overflows ·Decrease in sales due to supply chain disruption <Medium- to long-term> ·Increase in insurance premiums	<Short-term> ·Increase in needs for resilient infrastructure ·Increase in sales of products in areas with a high level of water-related risks ·Increase in needs for equipment/facilities for disaster preparedness	·Understand water risks and implement countermeasures · <b>Development of highly durable infrastructure</b> ·Accelerate infrastructure renewal in developed nations (e.g., SPR Method) ·Expand infrastructural business in developing nations · <b>Development of disaster response products (e.g., drinking water storage systems)</b> ·In-house fusion mechanism for adaptive product development, task force projects	Adaptation Adaptation Adaptation Adaptation Adaptation	— — — — —	Business Products Products Products Products	— — — — —
		Heavy rains/ droughts	Large ·Increase in insurance premiums						
	Chronic	Changes in rainfall patterns	Medium <Short-term> ·Increase in costs for restructuring supply chain <Medium- to long-term> ·Increase in heat stroke/other illnesses related to warming ·Increase in air conditioning/cooling costs	<Short-term> ·Increase in sales of heat insulating/heat shielding products <Medium- to long-term> ·Increase in needs for pharmaceutical products/ diagnostic drugs that contribute to treatments	·Explain procurement guides to raw material suppliers ·Globally disperse production bases ·Reinforcement of OEM structure in accordance with increase in illnesses	Adaptation Adaptation	— —	Business Business	— —

The "Financial Impacts" in the table were evaluated in three categories: large, medium, and small, in light of the magnitude of the impact on related financial indicators. The risks and opportunities that become apparent are described

in three stages: short-term (less than 3 years), medium-term (3 to less than 6 years), and long-term (6 years or more). Also, changes in risk analysis and responses due to the use of the 1.5°C scenario are shown in green (Table 2).

## 4-2. Scenario Analysis (Risks and Opportunities)

### <Methodologies and Results of Scenario Analysis>

In the scenario analysis, several driving forces were extracted that were predicted to affect the future of each business domain (residential, advanced infrastructure, innovative mobility, life science, and energy as the next frontier) and set up future scenarios with attention to driving forces that were assumed to have a large impact on the Group when future uncertainties were taken into account.

For example, in innovative mobility, it was assumed that cars with zero CO<sub>2</sub> emissions (ZEV: Zero Emission Vehicle) could be the mainstream society, and that conventional internal combustion vehicles could be another mainstream society, as one of the driving forces. Then, a scenario with advanced mitigation of climate change and a scenario with severe climate change were set as the other axis for consideration. In advanced infrastructure, it was assumed that evolution of a recycling-based society becomes a driving force. Then a scenario in which climate change has been mitigated and a scenario in which climate change has advanced were set as the other axis to consider whether the society will become a "recycling-based" society or a "waste disposing" society.

Then, scenario analysis results around driving forces that were determined to be highly common in the Group's business fields were integrated. The results are shown Figure 7. The axis with high commonality is the driving force to determine whether social systems such as town design and energy will become "centralized" (urban concentration and centralized management) or "decentralized" (local production and local consumption). Also, as for climate change scenarios, a scenario with advanced mitigation of climate change and a scenario with advanced climate change as another scenario axis were set, and assumed four scenarios related to the future of the Group's businesses in the four quadrants.

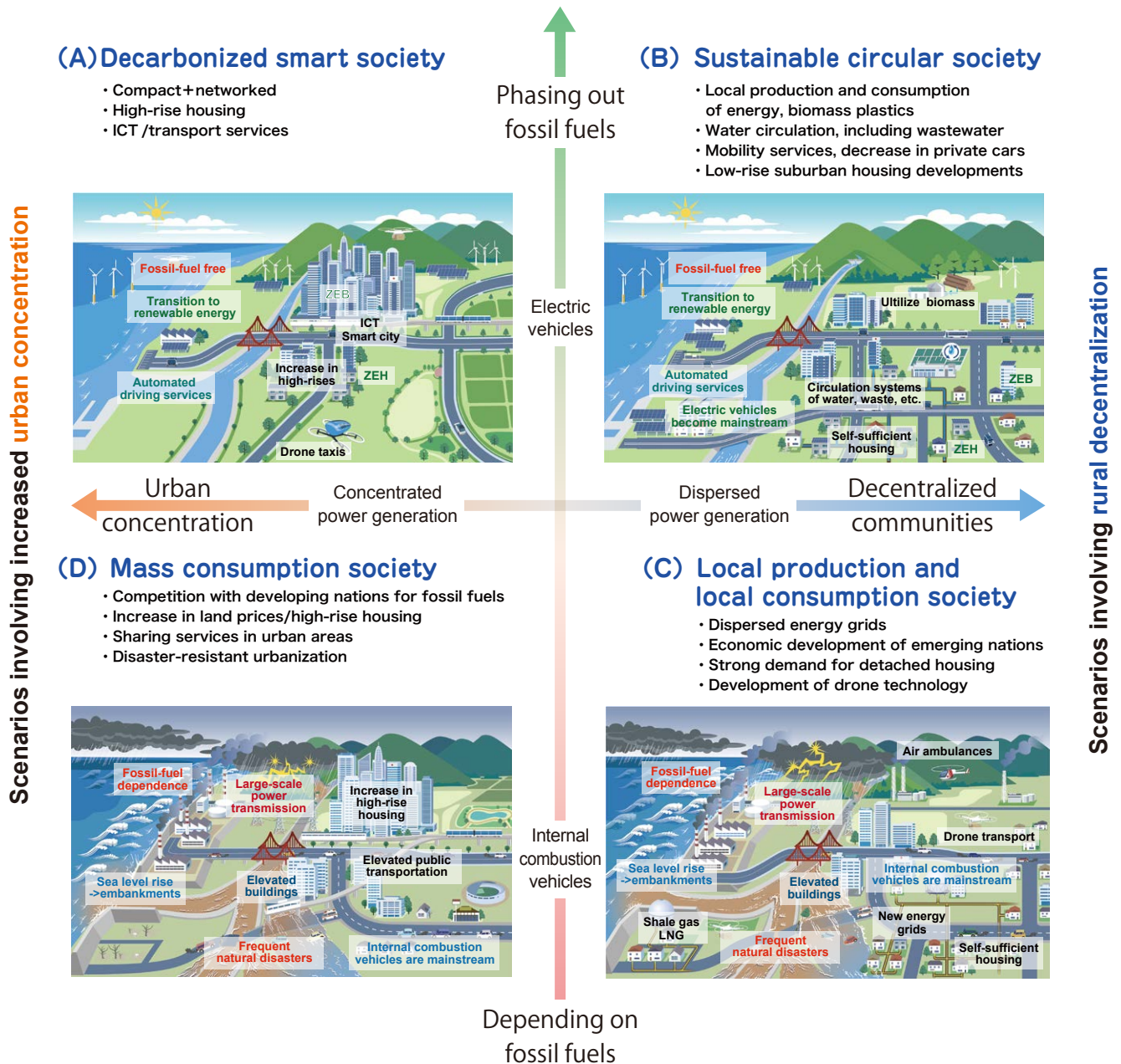
The possible risks and opportunities for the Group in these assumed societies were analyzed, and the results of considering the Group's strategies for adapting to the realization of the society envisioned in each scenario are outlined in the four diagrams after Figure 7.



## 1.5°C scenario

Tightened carbon tax / exhaust gas regulations,  
accelerated resource circulation, reduced water risk, mitigated impacts on aspects of nature

### Scenarios involving various measures taken to control climate change



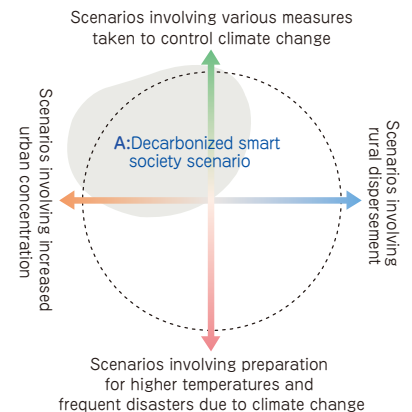
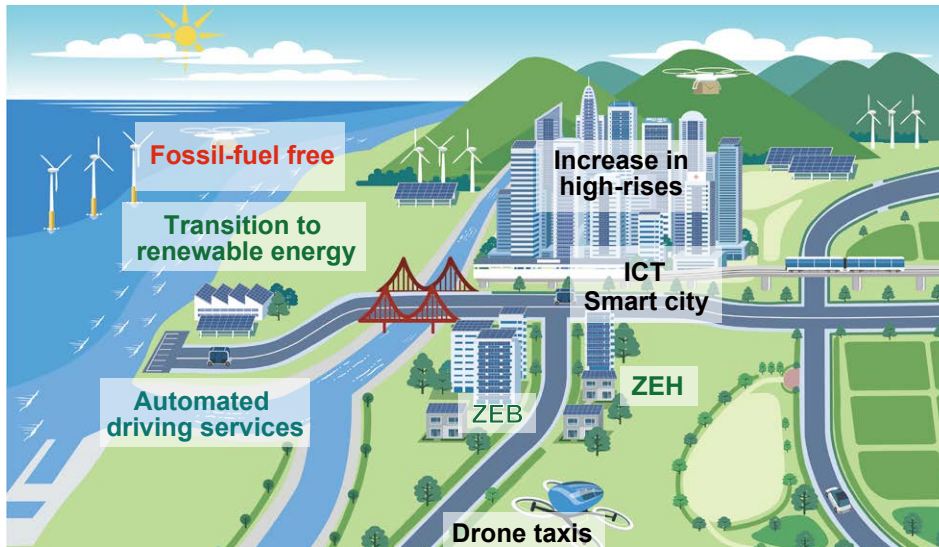
Scenarios involving preparation  
for higher temperatures and frequent disasters due to climate change

## 4°C scenario

Frequent natural disasters, delayed resource circulation system,  
increased water risks, increased negative impact on nature

Figure 7: Four Scenario Societies

## Scenario (A) Decarbonized smart society scenario (1.5°C & urban concentration scenario)



**Opportunities**

- Increased demand for smart infrastructure, remote control systems, etc. → Advanced technology utilization and expand services for infrastructure
- Increased demand for power generation/storage products → Higher performance of electronic/energy related products
- Expanding needs for decarbonized products and technologies → Advance development of decarbonization technologies and expand products sales

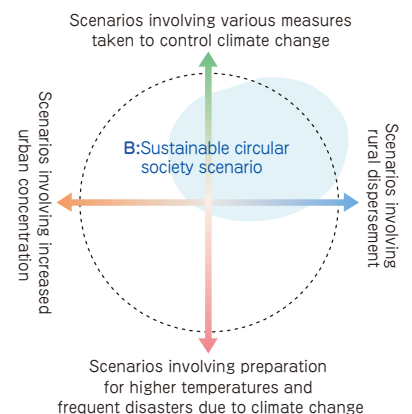
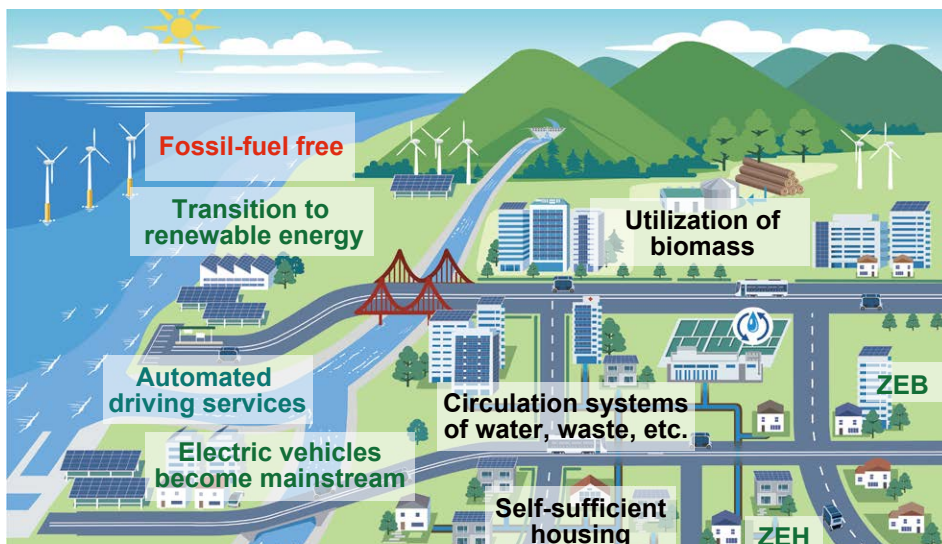
**Risks**

- Decreased car sales due to transition to mobility services → Decreased sales of housing and mobility related products
- Accelerate conversion to renewable energy → Energy procurement costs increase due to increased demand for renewable energy
- Decreased demand for low-rise housing → Decreased sales of housing related products

**Response by SEKISUI**

- [Production activities] Begin converting to renewable energy (installation of large-scale solar panels (USA), use of Smart Heim Denki)
- [Housing business] Standardize ZEH specs
- [Energy] Expand storage battery business
- [IT] Material development to promote improvement of ICT (heat dissipating materials, materials for LED and OLED)
- [Resource Recycling] Development of services to improve the recycling value of housing products ("Be-Heim"), consideration of expansion of horizontal recycling system for plastic products

## Scenario (B) Sustainable circular society scenario (1.5°C & decentralized communities scenario)



**Opportunities**

- Localized power generation → Increased demand for power generation, storage and related technologies
- Expanded circulation of resources such as electric power, water, carbon, etc. → Increased demand for circulation infrastructure
- Expanding needs for decarbonized products and technologies → Advance development of decarbonization technologies and expand product sales expansion
- Increased demand for housing with ZEH specs

**Risks**

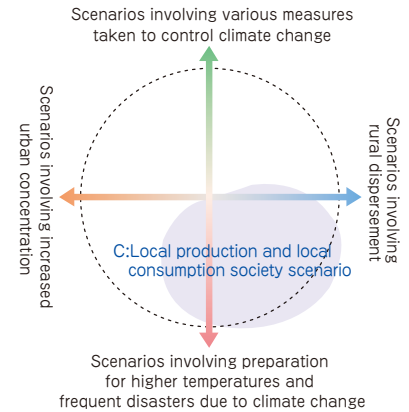
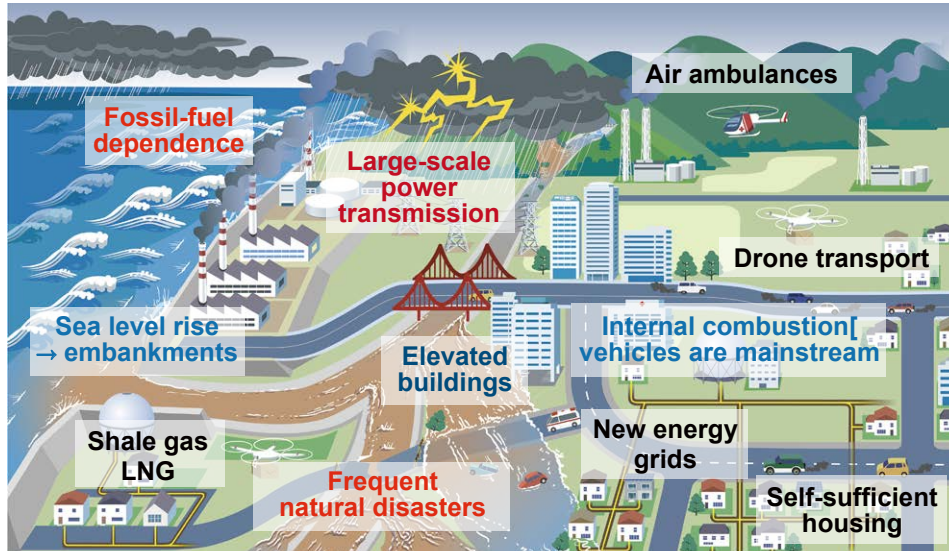
- Decreased car sales due to transition to mobility services → Decreased sales of housing and mobility related products
- Accelerate conversion to renewable energy (decentralized) → Energy procurement costs increase due to increased demand for renewable energy
- Decreased reputation among customers and investors due to failure to decarbonize

**Response by SEKISUI**

- [Production activities] Begin converting to renewable energy (installation of large-scale solar panels (USA), use of Smart Heim Denki)
- [Housing business] Standardization of ZEH specs, expansion and promotion of sustainable town development business
- [Energy] Promote the spread of energy self-sufficient housing (solar panels, storage batteries)  
Also contribute to local energy production and consumption through TEMS
- [Vehicles] Provide highly functional materials that provide additional performance to vehicles and aircrafts.  
(S-LEC wedge-shaped HUD interlayers, KYDEX sheets, CFTRP)
- Establish technologies for CCU systems (BR)
- [Resource recycling] Full scale implementation of BR technology, development of CCU technologies in collaboration with other companies



## Scenario (C) Local production and local consumption society scenario (4°C & decentralized communities scenario)



**Opportunities**

- Promoting resilient infrastructure and autonomous driving infrastructures → Increased sales of highly durable infrastructure materials and construction services
- Creation of market of new energy grids → Needs for control systems and energy infrastructure technologies

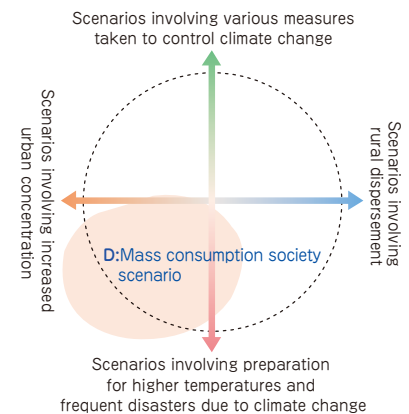
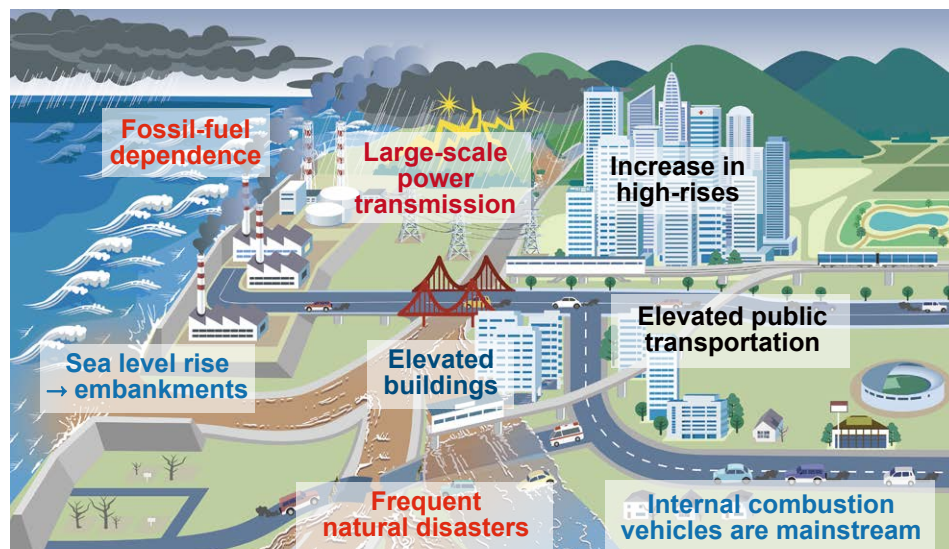
**Risks**

- Increased raw material and energy costs due to disaster-resilient supply chain, logistics, and energy security measures
- Increased factory relocation costs in locations vulnerable to natural disasters
- Increase in manufacturing costs and raw material costs caused by deterioration of ecosystem services due to disasters
- Increased human cost due to increase in diseases caused by global warming
- Extensive damages due to fragmentation of infrastructure in the area

**Response by SEKISUI**

- At the managers level of operating companies/business sites, understand risks in each region and site, formulate BCPs, and consider risk reduction measures
- [Water infrastructure] Expand businesses that contribute to more resilient water infrastructure (Renewal: SPR method, New construction: Collaboration with Vietnamese companies)
- [Transportation infrastructure] Improve durability of transportation infrastructure ("Utsuku Sheet", "InfraGuard")
- Reinforcement of OEM structure for pharmaceutical products
- Explore HEMS and TEMS technology for building smart grids (Smart Heim Denki)
- Develop urban planning businesses (expand services)
- Reinforce sustainable raw material procurement system

## Scenario (D) Mass consumption society scenario (4°C & urban concentration scenario)



**Opportunities**

- Promoting resilient infrastructure and autonomous driving infrastructures → Increased sales of highly durable infrastructure materials and construction services
- Increased needs for energy-related products for large-scale power generation → Increased sales of products related to stabilizing systems and improving efficiency of power generation

**Risks**

- Increased raw material and energy costs due to disaster-resilient supply chain, logistics, and energy security measures
- Increased factory relocation costs in locations vulnerable to natural disasters
- Increased human cost due to increase in diseases caused by global warming
- [Housing] Decreased demand for low-rise housing → Decreased sales of housing related products
- Increase in manufacturing costs and raw material costs caused by deterioration of ecosystem services due to disasters

**Response by SEKISUI**

- At the managers level of operating companies/business sites, understand risks in each region and site, formulate BCPs, and consider risk reduction measures
- [Water infrastructure] Expand businesses that contribute to more resilient water infrastructure (Renewal: SPR method, New construction: Collaboration with Vietnamese companies)
- [Transportation infrastructure] Improve durability of transportation infrastructure ("Utsuku Sheet", "InfraGuard")
- Reinforcement of OEM structure for pharmaceutical products
- Contribute to more stable power transmission by burying power cables underground ("CC-Box")
- Reinforce sustainable raw material procurement system

### <Summary of Scenario Analysis>

SEKISUI CHEMICAL Group's housing products and infrastructure-related products are all designed with resilience and are highly durable and resistant to disasters. In the 4°C scenarios (C) and (D) assumed in the scenario analysis mentioned above, these products with high durability or provide reinforcement to aging infrastructure can contribute to the solution of issues and expand businesses. In the 1.5°C scenarios (A) and (B) where mitigation of climate change is pursued, demand for renewable energy will increase even more, regulations will be tightened, and changes in consumer preferences will become more apparent. In addition, it is expected that resource recycling efforts will be accelerated and economic values will become visible, and can contribute to solving issues and capture business opportunities through; more aggressive efforts to control GHG emissions than ever before, solar-powered homes that will spur renewable energy conversion, new energy-creating technologies, and the development of materials that

will boost energy efficiencies of vehicles and aircrafts.

In such societies, it was naturally thought that water risks and impacts on biodiversity (aspects of nature) would also be mitigated. In addition to climate change, there are uncertain factors in the technological development in various industries. Even considering the development into a decentralized or centralized society in this analysis, it was confirmed that the Group organization structure is prepared to develop and add product line-up that were prepared for possible risks in the event of centralization, or prepared to convert the risks into opportunities with the technologies available in the event of decentralization. It is anticipated that lifestyles will change drastically and will change even more significantly from the effects of the COVID-19 pandemic. In this regard, the fact that the assessment of the impact of risks and opportunities in the scenarios considered in this process can be utilized was reconfirmed.

### 4-3. Validation of Climate Change Strategies

The following verifications were conducted on the validity of the strategies to address climate change issues, and confirming that they were appropriate.

- (1) Monitoring carbon efficiency (environmental performance)
- (2) Correlation between carbon efficiency and economic performance
- (3) Stakeholders' Comprehensive Income using impact-weighted accounting methodology

#### <Monitoring Carbon Efficiency (Environmental Performance)>

In order to verify how efforts that address climate change are affecting management, two indicators of carbon efficiency management (environmental performance) have been

monitored: "net sales per GHG emissions", and "earnings (EBITDA) per GHG emissions".

Figure 8(a) shows the carbon efficiency in business activities, and Figure 8(b) shows the carbon efficiency across the supply chain. Both indicators show an upward trend against business activities. Looking at the supply chain as a whole, there has been a temporary decline in FY2020, however it is believed that this is mainly due to the global COVID-19 pandemic. Accelerating the conversion to renewable energy has also been successful in terms of earnings per unit of GHG emissions in business activities. Through this verification, it was confirmed that efforts to address climate change issues are having a positive impact on management.



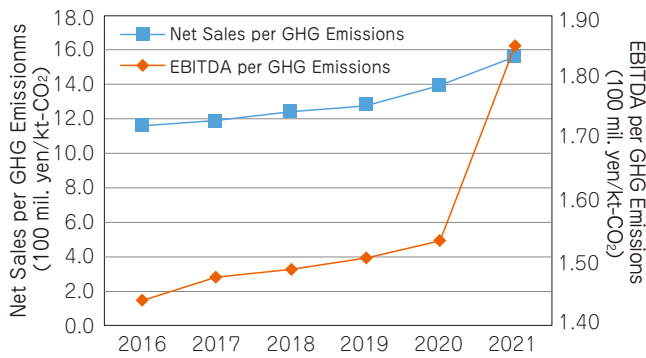


Figure 8(a): Carbon Efficiency in Business Activities

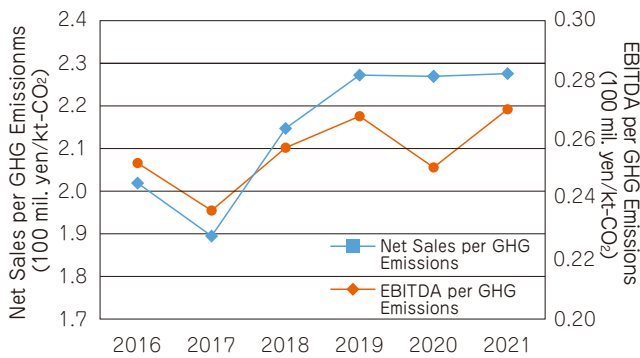


Figure 8(b): Carbon Efficiency Across the Supply Chain

[Reference] Calculation methods of the two indicators:  
 Net Sales / Greenhouse Gas Emissions (Net Sales per Carbon = 100 million yen / thousand tons-CO<sub>2</sub>)  
 EBITDA / Greenhouse Gas Emissions (Earnings per Carbon = 100 million yen / thousand tons-CO<sub>2</sub>)  
 [Reference] EBITDA = Earnings Before Interest, Taxes, Depreciation and Amortization

### <Correlation Between Carbon Efficiency and Economic Performance>

The impact of initiatives on management to address issues related to climate change was further examined by confirming the correlation between "net sales per unit of GHG emissions", an indicator of management's carbon efficiency (environmental performance), and "earnings per unit of sales (EBITDA)", an indicator of management's economic performance. The actual values of the two indicators in business activities from FY2016 to FY2021 are plotted in Figure 9, along with the target based on the FY2030 long-term vision. Until FY2020, "net sales per carbon" has been improving while

maintaining stable earnings with ESG management as the strategy. Furthermore in FY2021, corporate growth was achieved with both economic and environmental performances meeting their targets outlined in the Vision.

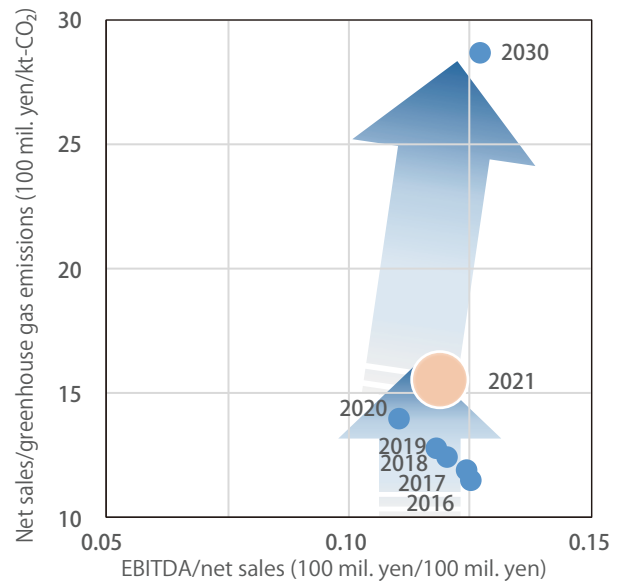


Figure 9: Correlation between Economic Performance and Environmental Performance

The results of this verification suggest that the strategies being pursued based on the long-term vision for 2030 tested correctly. In order to improve carbon profitability, efforts will be accelerated and new measures considered.

### <Stakeholder Comprehensive Income Using Impact-Weighted Accounting>

Climate change is affecting the entire earth. Initiatives to address climate change are thought to affect not only the Group's shareholders, but also multiple stakeholders such as customers, business partners, employees, and local communities. Therefore, in order to verify the validity of the strategies, it is necessary to consider the impacts on the stakeholders from a bird's eye view and

comprehensively, and the multi-stakeholder comprehensive income was calculated using impact-weighted accounting method. Impact-weighted accounting refers to the concept of integrating accounting and impacts by converting the impacts of corporate activities on stakeholders as a whole into monetary values and adding or subtracting them from profits, thereby ascertaining the corporate value for stakeholders as a whole. In this validation, comprehensive earnings were calculated using the following calculation method. LIME2 concept was adopted when converting economic losses on environmental aspects into economic values.

#### [Calculation Method]

Stakeholder Comprehensive Income = (Profit for the period + Value of employment created to implement climate change initiatives + Economic values of contribution to the reduction of greenhouse gas emissions from products + Economic values of effects on environmental aspects other than climate change issues from products)-(Economic losses from greenhouse gas emissions from business activities + Economic losses from environmental aspects other than climate change issues from business activities)

Figure 10(a) shows how the ratio of stakeholder comprehensive income to net income has changed since the 2016 base year, using impact-weighted accounting.

Although there were changes in the surrounding environment, it was suggested that stakeholder comprehensive income with respect to net income has been steadily improving as results of corporate activities in response to it, and has nearly doubled from FY2016.

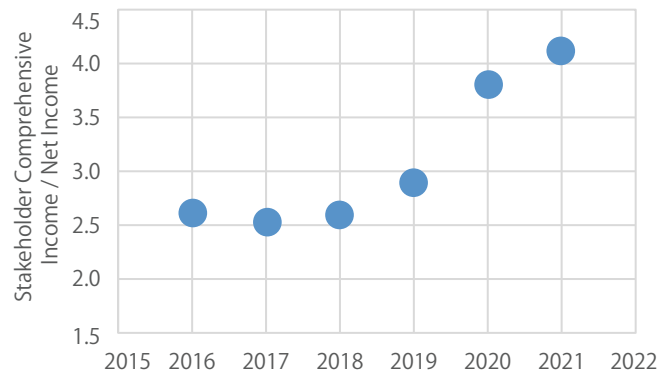


Figure 10(a): Stakeholder Comprehensive Income / Net Income

Furthermore, figure 10(b) shows the positive and negative impacts at each stage of the product's life cycle. In addition to the values determined by the financial indicators, "what are the positive impacts to multiple stakeholders" and "what are the negative impacts to the external environment" were able to be identified by performing the impact-weighted analysis separately for each process.

### <Summary of Validity Confirmation>

Based on the above analysis, it was reaffirmed that the initiatives and planned measures that are currently being implemented are expanding the positive impact, reducing the negative impact, and contributing to the enhancement of corporate value.

In order to solve issues related to climate change in the future, strategies will be developed and measures implemented for each process in management so that the positive impacts can be expanded and the negative impacts can be reduced.

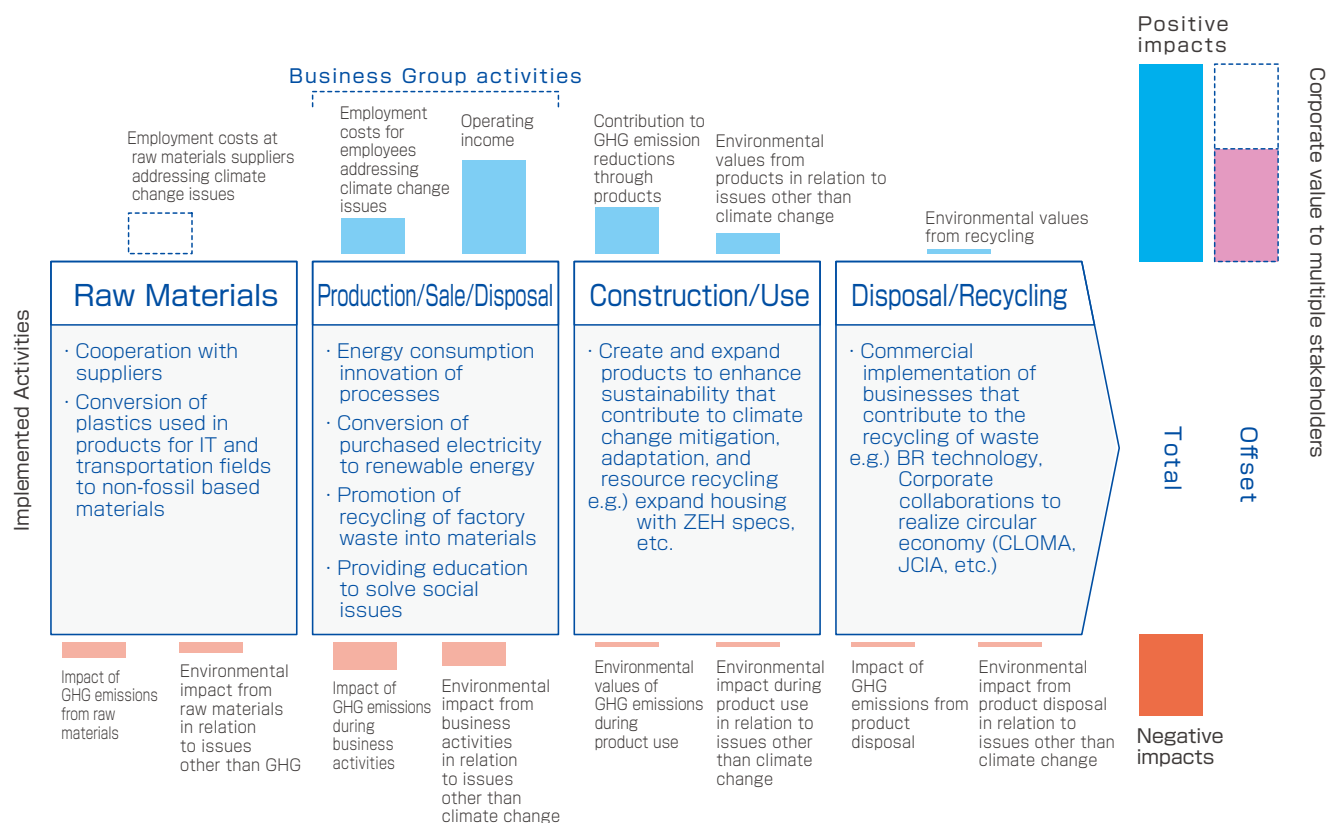


Figure 10(b): Details of positive and negative impacts on corporate value using impact-weighted accounting method (changes are based on FY2016)

#### 4-4. Impacts of Risks and Opportunities Related to Climate Change on the Organization's Businesses, Strategies, and Financial Planning

##### <Impacts of Climate Change on Businesses and Strategies>

Risks related to climate change can also be opportunities. SEKISUI CHEMICAL Groups formulates strategies and plans to address medium- to long-term climate change risks in order to reduce and convert these risks into

opportunities for products and services, supply or value chains, R&D investments, and operations. In addition, efforts based on these strategies will lead to the improvement of corporate value and comprehensive earnings are explained in the previous section.

Examples are shown below for each item.

[Reference] Case Studies: Examples of Risk Reduction and Conversion to Opportunities in Climate Change

##### [Resource Recycling Policy and Strategy]

Promoting resource recycling efforts will lead to accelerating decarbonization efforts. In FY2020, SEKISUI CHEMICAL Group established a policy on resource recycling along with long-term targets, and formulated a resource recycling strategy with a roadmap. This is an important strategy that shifts products to lower their carbon footprint throughout their life cycle. The resource recycling strategy and roadmap are laid out below.

##### [Group Policy]

- [1] Promote innovations that contribute to resource recycling
- [2] Expand the use of non-fossil fuel-based materials and recycled materials in our business operations
- [3] Maximize resource recovery during the entire product life cycle

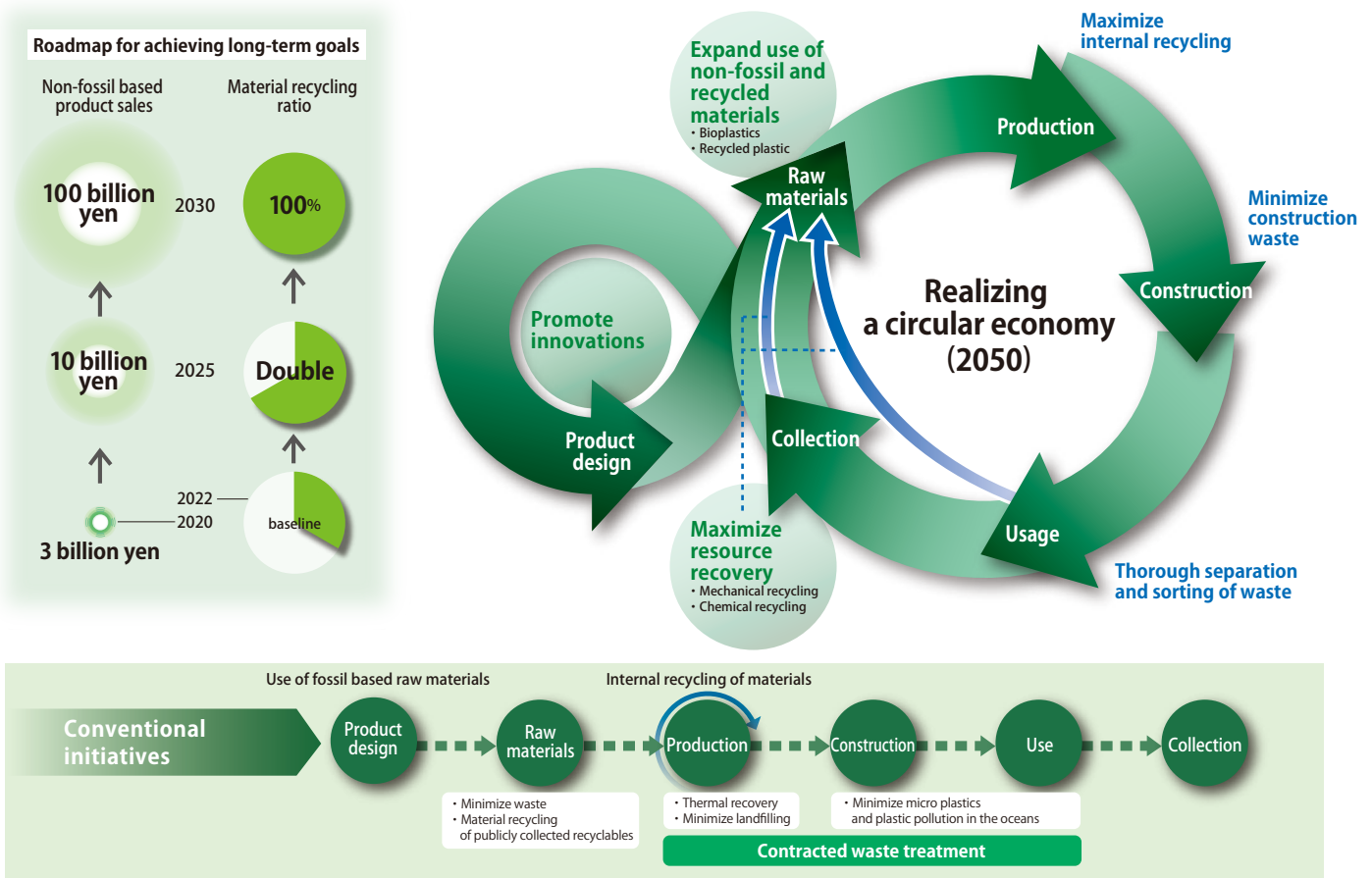


Figure 11: Outline of Resource Recycling Strategy

Table 3: Roadmap for Achieving Long-Term Resource Recycling Targets

		2020-2022	By 2025	By 2030
Business strategy	Net sales of products to enhance sustainability that contribute to resource circulation	1.1 times	1.3 times	2 times or more
Resource conversion of raw materials	Net sales of non-fossil based and recycled materials products	3 billion yen	10 billion yen	100 billion yen
Resource recycling of waste	Ratios of recycling waste plastics back into new materials	Analyze current conditions and set baselines	2 times	100%

[Products and services]

Case studies of products and services are shown below.

As part of the Group's preparedness for disasters, a few core manufacturing sites have installed cogeneration-based self-generation systems.

< Case Study 1 > Smart Heim Denki

In the housing business, SEKISUI CHEMICAL Group began offering homes equipped with solar panels from an early stage, as a strategy for mitigating climate change. Conversion to renewable energy had been recommended in Japan as a mitigation measure, and in the initial phases, subsidies and other programs such as the FIT scheme (scheme where surplus electricity generated is purchased back) were offered by the Japanese government to promote the transition. SEKISUI CHEMICAL Group's "SEKISUI Heim" housing has the advantage of being able to install large areas of solar panels that generate renewable energy by utilizing the flat roof design suitable for factory production. This greatly reduces CO<sub>2</sub> emissions while living in these houses and contribute to the economic performance, reducing electricity costs, for the resident.

Assumed Risks

Regarding electricity generated by solar panels, when the Japanese government's FIT scheme comes to an end, there will be no incentive to give back to society and to further market solar panels.

Converting to Opportunities

In order to promote the effective use of renewable energy, SEKISUI CHEMICAL Group purchases surplus electricity generated by solar panels from residential customers equipped with solar panels through the Smart Heim Denki business. In this business, the purchased electric power will be used in SEKISUI'S own manufacturing plants, or sold to other SEKISUI Heim customers.



## <Case Study 2> Housing Adapted to Climate Change Assumed Risks

Over the last several years, the effects of climate change have affected not only regulatory risks but also physical risks.

Housing that contribute to mitigation will bring economic benefits to customers and control global warming to society. On the other hand, demand will naturally decline for houses with low disaster resistance and services with insufficient consideration.

### Converting to Opportunities

SEKISUI Heim is a highly reliable disaster-resistant product that contributes to the adaptation to climate change. Prefabricated houses that are mostly build in factories are less susceptible to disasters caused by climate change. The houses can be quickly provided as temporary shelter in a natural disaster event caused by climate change, and therefore their production and construction methods are also adaptable to climate change. Highly reliable SEKISUI Heim not only reduces physical and psychological burdens during evacuation, but also enables residents to relocate the house itself to a different location after using as a shelter and perform necessary maintenance. It is a house that can also contribute to rebuilding lives and recycling resources. SEKISUI Heim has high thermal insulation and airtightness. Furthermore, by installing air conditioning systems such as "Kaiteki Airy", it is possible to provide housing that enable comfortable living with relatively little energy even when global warming is progressing due to the effects of climate change. Such ventilation systems also have the effect of controlling infectious diseases by preventing the spread of viruses indoors.

As mentioned above, ZEH (net Zero Energy

Homes) has penetration more than 89% of the housing market in FY2021. By installing storage batteries that can store electricity generated by solar panels in houses, they can be used in the event of natural disasters that occur frequently caused by climate change. SEKISUI has developed and designed housing and services based on the assumption that storage batteries will be used for the following purposes to secure utilities in the event of a disaster; (1) increase the capacity and making the size of the batteries more compact, and (2) propose designs in which batteries can be installed indoors or on the second floor so that batteries will not be damaged by flooding or storms. As a result, the number of storage batteries installed is increasing year by year. In addition, the "V to H" system, which connects solar houses with EVs, enables customers to travel to safe locations and transport goods even in the event of power outages due to disasters. Going forward, equipment and services based on the concept of "disaster reduction" that contributes to adaptation to climate change will be continued to be promoted.

## <Case Study 3> Building Disaster-Resilient Communities

### Assumed Risks

In order to adapt to water disasters caused by the effects of climate change, it is necessary not only to improve the adaptability of the housing, but also to make entire towns and communities resilient to disasters.

### Converting to Opportunities

In 2018, SEKISUI CHEMICAL launched the community development project "Safe & Sound Project" to think about the meaning of resilient communities and how to solve issues. This took into consideration community development

projects based on the fusion of the Group's technologies. The first town development project that will serve as a model is "Asaka Lead Town", which was developed in Asaka City, Saitama Prefecture, and was opened to the public and started selling lots in 2019. Examples of products provided by the Group, such as RCP (Resin Concrete Pipes) and rainwater storage system "Cross Wave", have been installed to promote temporary storage of storm water during torrential rains and typhoons, and to control flooding of rivers and houses. In addition, as a means of reducing damages caused by water disasters in communities and supporting reconstruction, installation of equipment such as an "emergency type temporary toilet system" in parks and schools that serve as evacuation sites in various regions are proposed. Furthermore, while promoting "town development" that leads to improvement of the value of the towns while conducting their original town management, eight projects with a total project cost of about 50 billion yen from the current mid-term business plan to the next mid-term business plan already been started. Of this amount, sales of 12 billion yen are planned for FY2022.

In October 2020, "Higashi-Matsuyama Lead Town" (Higashi-Matsuyama City, Saitama Prefecture) was released.

#### **<Case Study 4> Promoting Resilient Infrastructure in Developed Countries**

##### **Assumed Risk**

As risks such as water disasters caused by climate change increase, there is a need to make water supply and sewer systems and other infrastructure more resilient. In particular, water risk is an issue that affect some regions more than others. In developed countries, many

many of the water and sewer pipes were installed over 50 years ago, and there is a need for technologies to renew these aging infrastructures with short construction periods, minimize use of energy and resources, and minimal time to put pipes back into service.

##### **Converting to Opportunities**

With the aim of expanding the use of trenchless technologies such as the "SPR method", semi-automated construction methods and technologies that can accommodate a wide range of pipe shapes and sizes are being developed.

[Supply Chain or Value Chain]

The following are case studies related to supply chain or value chain.

<Case Study 1> Raw Material Suppliers

**Assumed Risk** \_\_\_\_\_

As regulations to mitigate the impacts of climate change are tightened, suppliers will also need to review their manufacturing processes and energy use. If responses to suppliers are delayed, their manufacturing costs may increase significantly, and there are concerns that the unit prices of those raw materials purchased will increase.

**Converting to Opportunities** \_\_\_\_\_

Since FY2018, in order to stabilize the supply of raw materials and mitigate climate change on a global scale, the Group has set greenhouse gas emission reduction targets and encouraging raw material suppliers to promote activities to reduce emissions through the Group's Procurement Guidelines. These guidelines have been reviewed and are being enforced to ensure continued sustainable procurement.

In addition, a purchasing system to procure raw materials from multiple suppliers has been adopted in order to prepare for risks that raw material manufacturing plants may shut operations due to disasters caused by climate change. Relocation of production sites are also being considered in areas where physical risks, such as natural disasters, are expected to be severe, to areas with less disaster risks.

By quickly implementing these measures, SEKISUI CHEMICAL Group is striving so that it will become a company that is chosen to meet the needs of customers that seek low-carbon footprint throughout their products lifecycles.

<Case Study 2> Improving Infrastructure in Emerging Countries

**Assumed Risk** \_\_\_\_\_

Frequent water disasters due to the effects of climate change will cause greater damages in emerging countries, where infrastructure is vulnerable and are not keeping pace with urban growth. When constructing a product supply system that meets the needs of customers in emerging countries, the Group operates production plants directly or source raw materials from other companies in the surrounding area.

**Converting to Opportunities** \_\_\_\_\_

In order to strengthen the water infrastructure foundation in emerging countries, marketing of Cross Wave, a rainwater storage system developed by SEKISUI, was expanded to emerging countries such as China, India, and other countries in southeast Asia.

In FY2019, a cooperative framework with the local Water Resources Bureau in Indonesia was established to promote the products. As a result, the products were selected for a large-scale residential development project and contributed to the green infrastructure business in Indonesia. Also, in order to quickly build a resilient water and sewage infrastructure, the Group is accelerating the business of providing water infrastructure products such as "Eslon Pipes" (PVC pipes) and fittings in partnership with a Vietnamese company.

## [Investment in R&D]

All R&D projects at SEKISUI CHEMICAL Group are selected according to long-term strategies that take into account environmental and social issues such as climate change and contribute to solving these issues. These projects are explored based on appropriate business plans.

### <Case Study 1> Perovskite Solar Cell (PSC)

#### Assumed Risk

With the increasing demand for solar cells, conventional solar cells will have to address issues of depletion of scarce resources, requirements for reduced energy consumption, and restrictions on installation location that take into account the impact of ecosystems and the strength of the buildings where they are installed. Also, further supply of renewable energy will be required, and failure to meet this demand could result in a reduction of related businesses.

#### Converting to Opportunities

Research and development of perovskite solar cells have begun by utilizing the Group's film extrusion technology.

These solar cells are lightweight and highly efficient, offer greater freedom in installation location, and are able create more energy than conventional technologies.

### <Case Study 2> Bio-Refinery (BR) Ethanol Technology

#### Assumed Risk

Conversion of raw materials to non-fossil based resources and recycling of wastes into materials are being promoted from both the perspective of carbon circulation and resource circulation as mitigation of climate change. Failure to contribute to technological development and businesses that contribute to resource recycling across the supply chain can lead to missed opportunities to enter the market in the future.

#### Converting to Opportunities

A 1/10 scale demonstration plant was set up in Kuji City, Iwate Prefecture, for the full-scale commercial implementation of the BR ethanol technology that converts ethanol from waste, which can be expected as a technology for effective utilization of carbon dioxide recovery (CCU) that contributes to mitigation of climate change. SEKISUI is also collaborating with other companies on the development of technologies for manufacturing plastics from the ethanol that is produced.

### <Impacts of Climate Change on Financial Planning>

As previously stated, scenario analysis is used to analyze risks and opportunities, and activities have been implemented since FY2020 under a medium-term management plan that reflects strategies for reducing risks and capturing opportunities. This includes the “Products to Enhance Sustainability” system, an in-house initiative for creating and promoting products that contribute significantly to solving environmental issues, including climate change. By expanding sales of these products to the FY2022 target of 800 billion yen, they will further contribute to solving environmental issues, including climate change. By transforming risks into opportunities, these products will accelerate business growth, and contribute to reaching the long-term plan that aims to double the Group's businesses by 2030.

Strategies to reduce climate change related risks and turn risks into opportunities have proven to be appropriate, through conducting carbon efficiency analysis and value analysis using impact-weighted accounting. Also, the need of strategies that turn current environmental values into positive impacts was suggested in future financial planning.



**[Overview]**

Milestones are set by backcasting from the long-term goals of “SEKISUI Environment Sustainability Vision 2050” vision, and have established the medium-term environmental plan “Environment Sustainability Plan: Accelerate II”. In this plan, the following two indicators are set to manage progress on climate change.

1) Net sales of Products to Enhance Sustainability\*<sup>2</sup>

2) Greenhouse gas emissions (SCOPE 1, 2, and 3)

In fiscal year (FY) 2021, net sales of Products to Enhance Sustainability was 772.4 billion yen and achieved the target of 750 billion yen. Of these, sales of products that contribute to resource recycling totaled 360.4 billion yen, of which sales of products that contribute to resource conversion of raw materials to resources totaled 45.3 billion yen. Targets on resource recycling strategies was achieved and efforts on decarbonizing product are accelerating.

Regarding greenhouse gas emissions, the Group’s business activities achieved the reduction targets, but reduction targets for the supply chain could not be achieved.

\*<sup>2</sup> Products to Enhance Sustainability System:

A system that certifies and registers products that contribute significantly to solving environmental and social issues (including climate change issues), under in-house standards. Products are reviewed by a certification committee composed of in-house members to determine whether they meet the registration criteria. Also, the committee receives advice from the external advisory board to ensure high standards and transparency.

## 5-1. Indicators for Assessing Risks and Opportunities Related to Climate Change —

- Sales of Products to Enhance Sustainability (of which, sales of products that contribute to resource recycling, sales of non-fossil based products, and products using recycled materials)
- Greenhouse Gas Emissions (SCOPE 1, 2, and 3)

As initiatives to solve environmental and social issues, various indicators and goals are set in the SEKISUI CHEMICAL Group medium-term environmental plan “Environment Sustainability Plan: Accelerate II” (FY2020–FY2022), which is formulated based on the Group-wide medium-term management plan. Measures are promoted to improve effectiveness by setting and managing their progresses. For the risks and opportunities identified by the impact analysis previously mentioned, indicators are set and monitored regularly to evaluate the progress of reducing risks or capturing opportunities. In order to solve climate change issues and reduce the risks of the 4°C scenario, indicators are set from two main perspectives and the progress of efforts towards achieving the

indicators are monitored.

The first is for expanding products that contribute highly to solving climate change issues through products and businesses. The Products to Enhance Sustainability\*<sup>2</sup>, an internal certification system for the Group’s products, is used as this index.

The other is reducing greenhouse gas emissions. Efforts to reduce greenhouse gas emissions from the Group’s own business activities will be promoted. An index to assess both greenhouse gas emissions from its own business activities and greenhouse gas emissions in the supply chain (SCOPE 3) as an indicator to reduce risks have been set. GHG emissions from transporting the Group’s own

products are included in SCOPE 1 and 2 as GHG from its own business activities. The degree of achievement of these indicators is reflected in environmental performance

evaluation points, and is reflected in the bonuses and executive compensation of employees in managerial positions and above.

## 5-2. Net Sales of Products to Enhance Sustainability

[Targets for Creation and Market Expansion of Products to Enhance Sustainability]

Double business volume by solving social issues (including climate change issues) in 2030  
Of which, sales of Products to Enhance Sustainability that contribute to resource recycling:  
more than double (2020 baseline)  
Of which, sales of non-fossil based products and recycled materials:  
more than 30 times (2020 baseline)

800 billion yen in net sales for "Products to Enhance Sustainability" in 2022  
Of which, sales of Products to Enhance Sustainability that contribute to resource recycling:  
1.1 times (2020 baseline)  
Of which, sales of non-fossil based products and products that use recycled materials:  
1.1 times (2020 baseline)

Targets set for "Creation and Market Expansion of Products to Enhance Sustainability" are set as above, and the progress is monitored by checking the results, shown above.

Among the products that enhance sustainability, efforts are put in and monitored to increase the amount of contribution to the reduction of greenhouse gas emissions from products that contribute to climate change issues.

Furthermore, as shown in the resource recycling policy and roadmap in Chapter 4 (Strategies 4-4), addressing resource recycling issues and realizing a circular economy are important measures that will lead to the realization of a

carbon-free society.

It also believed that initiatives and means to realize decarbonization and resource recycling are meaningless unless they reduce the impacts on aspects of nature, including biodiversity.

Therefore, in addition to working to expand low-carbon products that contribute to resource recycling, products and their manufacturing processes on aspects of nature are also monitored so that impacts can be shifted to a more positive direction (calculated based on the LIME2 concept).

[Initiatives and Achievements Related to Products to Enhance Sustainability]

**Net Sales of Products to Enhance Sustainability:**

772.4 billion yen (achieved targets of sales ratio = 66.7% and volume = 750 billion yen)

Of which, sales of Products to Enhance Sustainability that contribute to resource recycling:

363.3 billion yen (achieved 1.2 times the baseline of 296 billion yen, achieved the target by 1.1 times)

Of which, sales of non-fossil based and recycled material based products:

35.3 billion yen (achieved 11.8 times the baseline of 3 billion yen, achieved the target by 1.1 times)

In FY2021, 28 products to enhance sustainability were registered, bringing the total number of registered products to 184 as of the end of March 2022. Net sales were 772.4 billion yen, achieving the target of 750 billion yen. The ratio to net sales rose 6.1 percentage points from 60.6% in FY2020. The product portfolio reform since FY2020 have shown that the shift to business expansion to solve social issues are steadily accelerating.

In FY2021, a total of 16 products were registered that contribute to resource recycling (and also lead to low carbonization) as a result of an increase in awareness on resource recycling and contributing to their solutions and clarification of in-house standards such as degree of contribution. Examples include plastics that are horizontally recycled (recycling scheme where a used product is converted into a resource for the same product) and products derived from biomass.

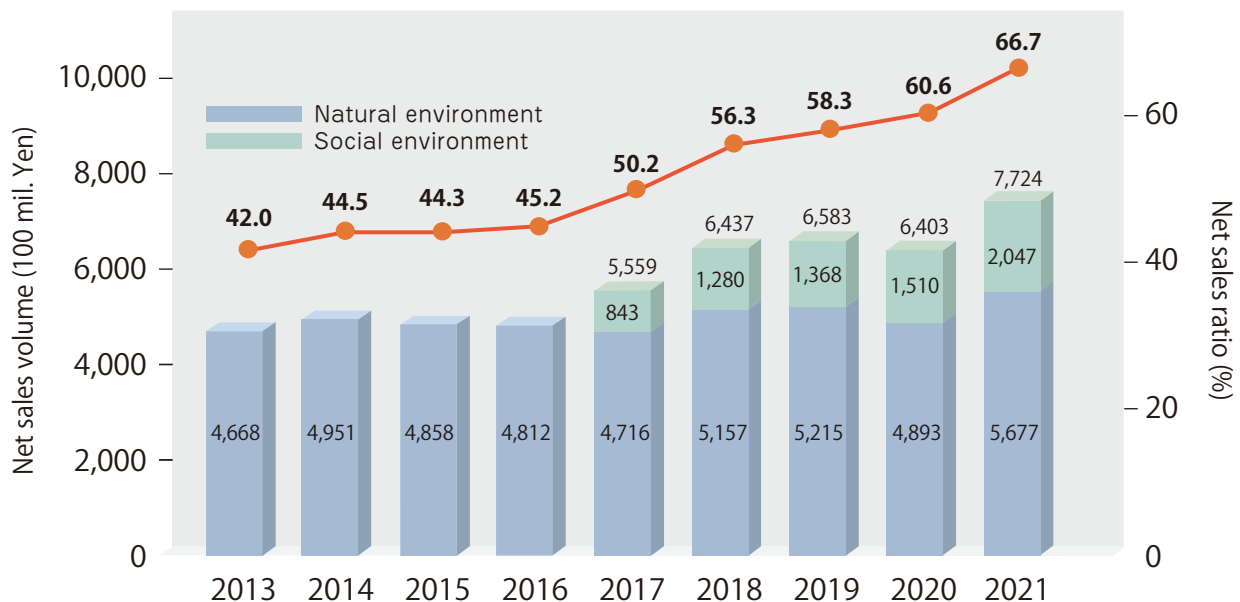


Figure 12: Net Sales Volume and Sales Ratio of Products to Enhance Sustainability

[Reference 1]

Contributions to reducing greenhouse gas emissions in business operations and products by "products to enhance sustainability": 6,976 kt-CO<sub>2</sub> (FY2021)

The following table shows the reductions in greenhouse gas emissions over the product life cycle when compared to conventional or other comparative products. Compared with the emission amount of 6,375 kiloton CO<sub>2</sub>/year in FY2020, an increase in contribution to reduction of 601 kilo-ton-CO<sub>2</sub>/year was observed.

The increase in the ratio of ZEH housing sold and the demand for vehicles and transportation materials have increased contributions to mitigating climate change.

"S-LEC", an interlayer film for laminated glass used in automobile windshields, improves car

air-conditioning efficiency by providing heat insulation and sound insulation, and reduces greenhouse gas emissions during driving by contributing to weight reduction. Foam materials, which are intermediate material rarely visible, are also developed in accordance with their properties, contributing to the reduction of CO<sub>2</sub> emissions during use. "THERMOBREAK", a heat insulation material for pipe ducts marketed in the ASEAN region, exerts an energy-saving effect due to its high thermal insulation. "Function Foam Tape" that has impact-absorbing properties, contributes to the performance of energy-saving LCDs.

In the future, greenhouse gas emissions in manufacturing, including SCOPE 3, will be further reduced, while enhancing functions and adding new functions to products, and develop new products. In addition, markets that contribute to the reduction of greenhouse gas emissions will be driven, and the amount of contribution to reduction through our group's products will be increased (Fig. 13).

Table 4: Contributions to Reducing Greenhouse Gas Emissions\*7 from Products (FY 2021)

Business Domain	Contribution to Reductions to GHG Emissions	Remarks
Housing	1,077	Solving energy problems from the perspectives of energy creation, energy saving, and energy storage by installing solar panels, HEMS, and storage batteries
Infrastructure	580	Trenchless methods, which renew old pipes, not only reduces resources and waste, but also minimizes traffic disturbances during construction, improving fuel efficiency by reducing time stuck in traffic.
Vehicles and Transportation	3,785	Laminated glass interlayer film used for vehicle windshields. High-performance film with heat and sound insulation contribute to fuel efficiency reduction by reducing the weight of vehicles and improving the efficiency of car air conditioners.
Electronic Materials	1,352	Intermediate materials that contribute to the performance of LEDs, which are energy-saving light sources.
Others	181	—
<b>TOTAL</b>	<b>6,976</b>	

(Units: kilo-ton CO<sub>2</sub>/year)

\*7 Contributions to Reducing Greenhouse Gas Emissions from Products:

LCA Software MilCA (Japan Environmental Management Association for Industry) and LCI Database IDEA (Japan Institute of Advanced Industrial Technology and Technology and Japan Environmental Management Association for Industry) are used to calculate the amount of greenhouse gas emissions reductions in the life cycle of products that account for 75% of the total sales of products to enhance sustainability.

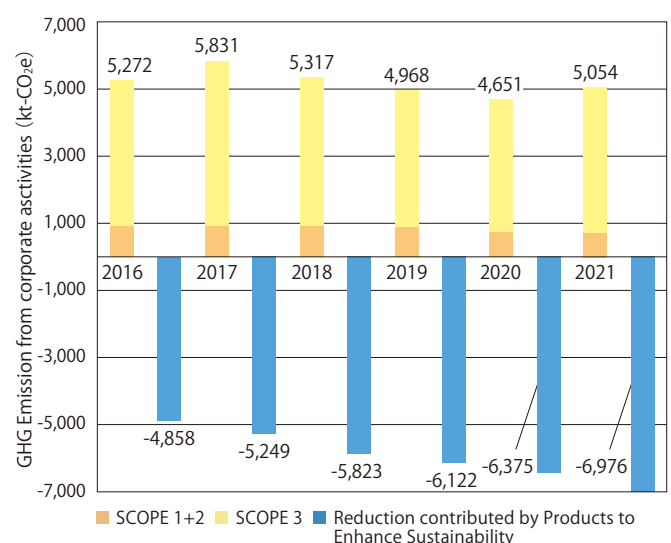


Figure 13: GHG emissions from corporate activities and contributions to reductions from products

[Reference 2]

Rate of return to natural and social capital from corporate activities

"SEKISUI Environmental Sustainability Index": 117.7%

Rate of return to the impact regarding the aspect of Nature

Rate of return to biodiversity: 49.7% Rate of Return rate to plant biomass: 41.0%

In the SEKISUI Environmental Long-Term Vision 2050, SEKISUI CHEMICAL Group aims for "an earth where biodiversity is maintained". For this reason, initiatives that utilize the "net positive" concept regarding ecosystems are promoted. As

an integrated index for confirming the degree of progress toward the environmental long-term vision, the rate of return to natural and social capital is calculated as the "SEKISUI Environmental Sustainability Index".

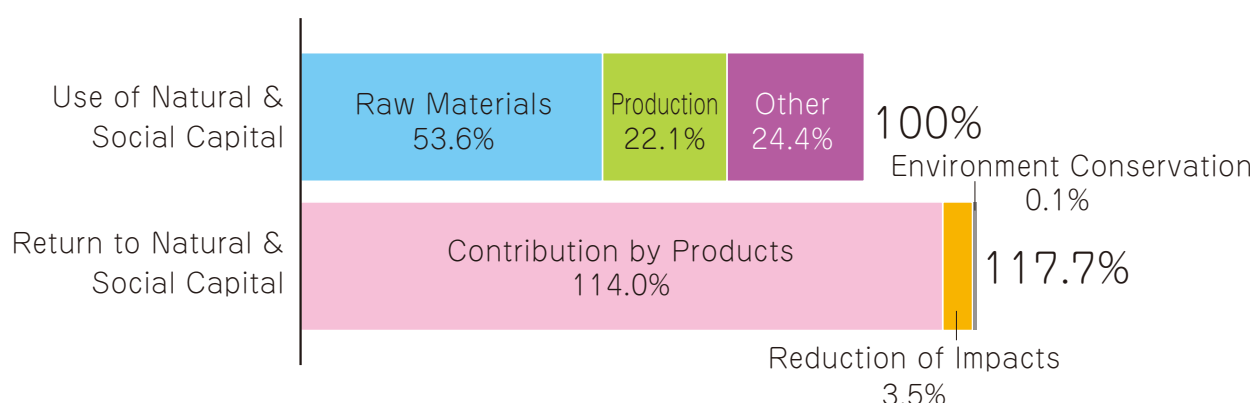


Figure 14: SEKISUI Environmental Sustainability Index (2021)

As a breakdown of this calculation, in addition to climate change issues, the effects on plant biomass (primary production of plants) and biodiversity (number of extinct species) will be estimated, and monitor the impact on natural capital (aspects of nature).

On the two aspects of plant biomass and

biodiversity, the rates of return are shown in Figure 15. Both have yet to reach rates of return of 100% or more, but corporate activities toward nature positive by addressing environmental issues such as climate change and resource recycling are steadily implemented.

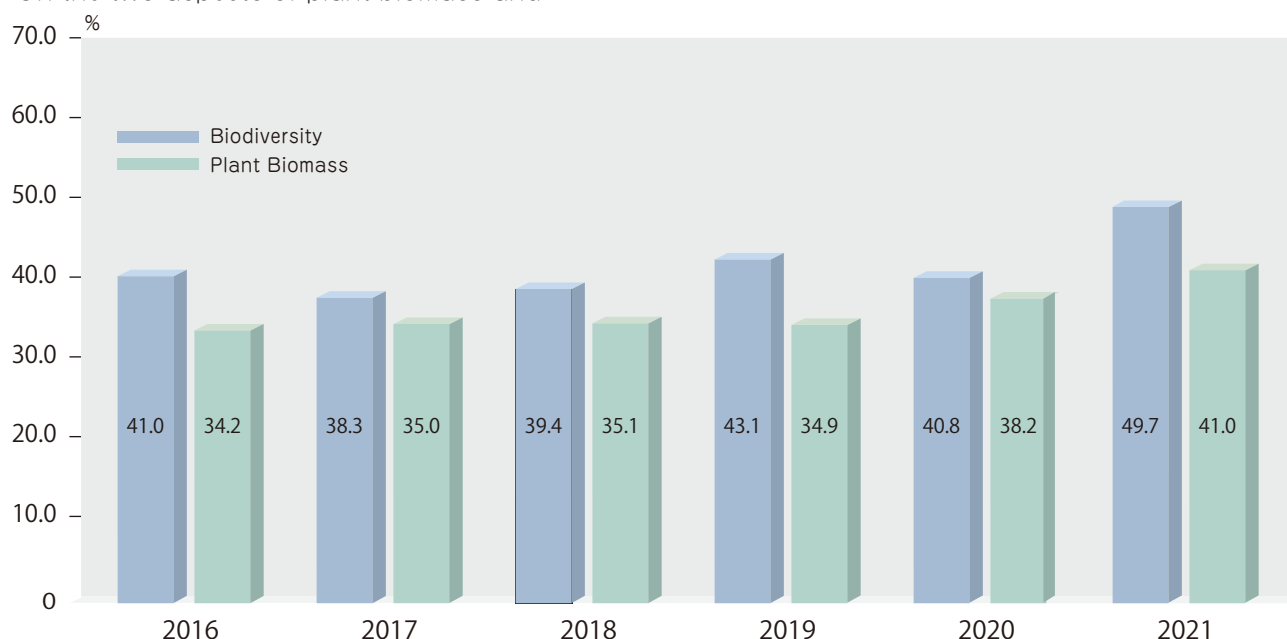


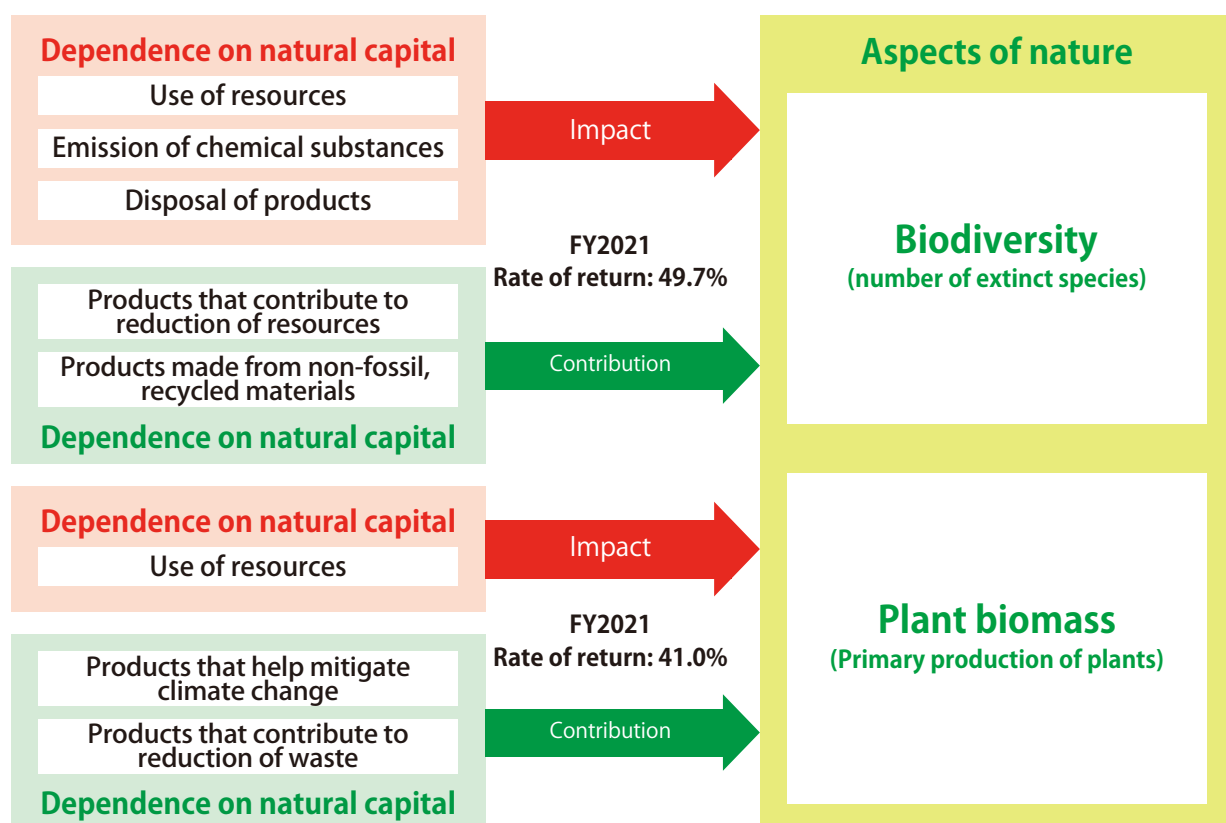
Figure 15: Rates of return to the impacts regarding the aspects of nature



SEKISUI CHEMICAL Group recognizes that the discharge of raw materials and chemical substances, and the disposal of products sold have major impacts on biodiversity. The major impact on plant biomass comes from paper especially derived from biomass. It is also recognized that materials derived from petroleum have a significant impact as well. In order to reduce these impacts, it is important to manage procurement with sustainability in mind, for example with non-fossil based resources, as stated in the Resource Recycling Policy. In order to strengthen sustainable procurement of raw materials, matters to be considered in supplier management are reviewed, sustainable procurement guidelines were prepared, and have started activities to reduce environmental impact and corporate risks in cooperation with suppliers. Products that make significant contributions to biodiversity include, for example, are products that contribute to the reduction of mineral, fossil, and forest resources. These include products that contribute to resource recycling by reducing energy consumption during operation of vehicles and transportation, and other products that improve durability and convert raw materials.

Examples of the former are products for aircrafts and railcars manufactured by KYDEX, and examples of the latter are products related to the SPR Method for the rehabilitation for sewer pipes. Products that greatly contribute to plant biomass include, for example, products that control global warming and other products that can reduce waste. An example of the former include SEKISUI Heim houses equipped with solar panels, and an example of the latter include Kraft tape, that have thinner paper cores than before.

In order to reduce the impact of these products on the aspects of nature and increase returns, products and technologies will be developed that contribute to decarbonization and reduce waste from products sold. It is also important to establish services and technologies that promote resource recycling, and this will be accomplished by expanding the “products to enhance sustainability”. Going forward, manufacturing while confirming these rates of return will continued to be promoted in order to carry out nature-positive corporate activities (Fig. 16).



\*Rate of Return = Amount returned / Amount used, LIME2 is used for quantification

Figure 16: SEKISUI CHEMICAL Group's Initiatives for Nature Positive

## 5—3. Greenhouse Gas Emissions (SCOPE 1, 2, and 3)

### [Targets for Reducing Greenhouse Gas Emissions]

Long-term target	:	To achieve virtually zero emissions from SEKISUI CHEMICAL Group's own business activities in 2050
Medium-term targets:		<ul style="list-style-type: none"> <li>• Reduce GHG emissions from SEKISUI CHEMICAL Group's own business activities by 26% in 2030 compared to FY2013</li> <li>• Reduce GHG emissions from SCOPE 3 by 27% compared to FY2016</li> </ul>

The roadmap for the reduction of greenhouse gas emissions by the Group's own business activities through FY2050 is shown in Figure 17. Under the previous Medium-Term Environmental Plan (2017-2019), initiatives such as "energy consumption innovation" have been promoted with a focus on manufacturing and updating aging production equipment. This initiative has been revised as "Energy Procurement Innovation" as of this mid-term environmental plan (2020-2022).

In FY2020, a long-term environmental vision was formulated that revised the target from 2030 to 2050 and initiatives started to be implemented. In this long-term vision, a goal is set to reduce the amount of greenhouse gases emitted from business activities to virtually zero by FY2050. The target is to achieve a 26% reduction of GHG from FY2013, by converting 100% of purchasing electricity to renewable energy as a major milestone for 2030.

Also, efforts will be put in to reduce greenhouse gas emissions to zero by actively promoting generation of clean energy and fuel conversions through technological innovations by FY2050. Another target is to reduce greenhouse gas emissions in the supply chain (SCOPE 3) by 27% in 2030 compared to FY2016.

The SCOPE 3 emissions in FY2016 were largest

for "purchased products and services" (SCOPE 3, category 1), accounting for approximately 50% of the total, followed by "use of sold products" (SCOPE 3, category 11) which accounted for about 35%. Since 2018, procurement standards for "purchased products & services" (SCOPE 3, category 1) are being reviewed to ask raw material suppliers about the setting targets and monitor their progress on their reduction of greenhouse gas emission. By obtaining the greenhouse gas emissions of raw material suppliers through the CDP Supply Chain Program, activities to create opportunities for dialogue and to collaborate for reduction have started. In addition to calculating greenhouse gas emissions and disclosing data, information exchange with raw materials suppliers are actively conducted on long-term targets and reduction measures in order to build a relationship that promotes reduction for both parties.

Furthermore, a target is set to reduce emissions by 20% in 2030 through converting to bio-materials and recycled raw materials.

Also for the "use of sold products" (SCOPE 3, category 11), a target is set for a 50% reduction in 2030 by expanding sales of ZEH-specification homes.

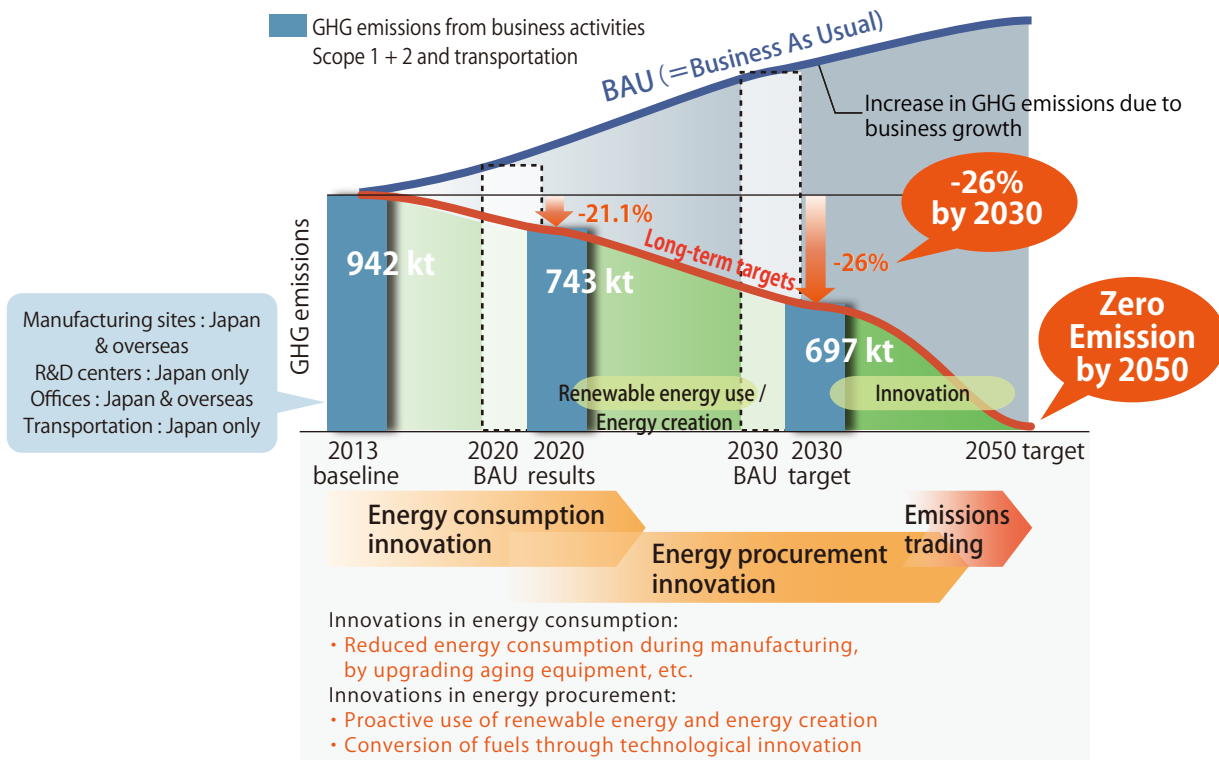


Figure 17: Roadmap of Greenhouse Gas Reduction

The following management indicators and targets for greenhouse gas reduction have been established, and initiatives are being implemented.

Table 5: Medium-and Long-Term Targets for Reducing Greenhouse Gas Emissions

Initiatives	Indicators	Medium-term targets (2020~2022)	2030	2050	Remarks
Reduction of GHG emissions	Ratio of renewable energy of purchased electricity	20%	100%	Maintain 100% (convert all electricity to renewable sources)	Joined RE100
	Reduction of GHG emissions through business activities	Reduction of 9% or more (compared to FY2013)	Reduction of 26% or more (compared to FY2013)	Zero emissions	Obtained SBT certification (Until 2030)
	Reduction of GHG Emissions in Supply Chain	—	Reduction of 27% or more (compared to FY2016)	—	
Energy savings	Energy consumption per unit of production	Reduction of 3% or more (compared to FY2019)	Reduction of 10% or more (compared to FY2019)	—	

For more information on calculating GHG emissions in the supply chain, see Sustainability Report 2022, P198-200.

[Efforts and Achievements Related to Reducing Greenhouse Gas Emissions]

Ratio of renewable energy of purchased electricity	: 19.7% (achieved FY2021 target of 10%)
Reduction of greenhouse gas emissions in business activities	: 21.1% compared to FY2013 (achieved FY2021 target of 8%).
Reduction of greenhouse gas emissions in supply chain (SCOPE 3)	: 1.3% compared to FY2016 (did not achieve FY2021 target of 9.6%)

In order to reduce greenhouse gas emissions from the Group's business activities, the conversion of purchased electricity to renewable energy by installing solar power generation systems within its own business sites are actively promoted, and consuming the generated electricity within the business sites, or switching electricity purchased from power companies to renewable energy sources. In FY2021, three business sites installed solar power generation systems, and reaching the total number to 12 sites in Japan and abroad, and bringing the total power generation capacity to 7.7 MW. Also, regarding electricity to be purchased from power companies, 20 sites in Japan and overseas have completed the conversion to 100% renewable energy. In FY2021, the ratio of renewable energy ratio of purchased electricity is 19.7%, including in-house solar power generation. From 2017, an environmental investment quota of 0.3% or more of Group-wide net sales over three years has been strategically set, promoting conversion to energy-saving processes that reduces greenhouse gas emissions to help mitigate climate change, and investments that contributes to water risk reduction to help adapt to climate change.

Particularly regarding the reduction of greenhouse gas emissions, an investment frame work that incentivizes investments that contribute to the environment has established. This is one of the internal carbon pricing systems, and it is a mechanism to provide financial support from headquarters to the investing department at a conversion rate of 30,000 yen per 1t-CO<sub>2</sub> of GHG emissions reduced.

The CO<sub>2</sub> emissions reduced by these investment projects is increasing year by year as the equipment and facilities are completed, contributing continuously to the reduction of greenhouse gas emissions in manufacturing. In FY2021, the reduction in greenhouse gas emissions from this initiative was 34.8 kilotons-CO<sub>2</sub>.

In FY2021, while production was recovering from the effects of COVID-19, greenhouse gas emissions from business activities was reduced by reducing the unit of CO<sub>2</sub> emissions of purchased steam, in addition to the effects of renewable energy of purchased electricity and the environmental contribution investment program. The rate of reduction was 21.1%, achieving the 2021 target of 8% (compared to FY2013) (Fig. 18).

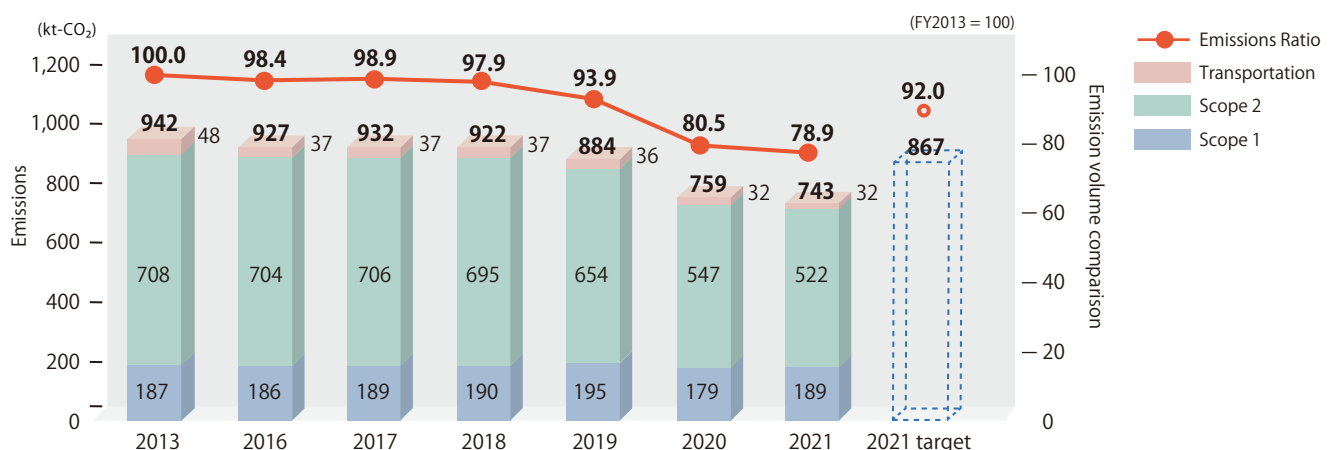


Figure 18: Greenhouse Gas Emissions from Business Activities



Regarding the reduction of greenhouse gas emissions in the supply chain (SCOPE 3), the results for FY2021 were as follows.

- SCOPE 3 overall : 1.3% decrease  
(compared to 2016)
- Category 1 : 12.2% increase  
(purchased products and services) (compared to 2016)
- Category 11 : 47.4% decrease  
(use of sold products) (compared to 2016)
- Category 12 : 93.7% increase  
(disposal of sold products) (compared to 2016)

Overall for SCOPE 3 decreased by 1.3% (compared to 2016).

Category 1 (purchased products and services), which accounts for the majority of the total, increased by 12.2% (compared to 2016), and

despite the expansion of businesses, it has not yet been reduced. Activities centered on working with suppliers and converting raw materials to bio-derived materials and recycled materials have started, but initiatives and measures for further acceleration are being considered.

Category 11 (use of sold products), on the other hand, showed a significant reduction of 47.4% (compared to 2016). This is due to the fact that the ratio of ZEH-specification homes sold has increased to 89%.

Category 12 (disposal of sold products) has not been reduced since 2016. It is necessary to accelerate the realization of the effects by steadily implementing the resource recycling strategies announced in 2021.

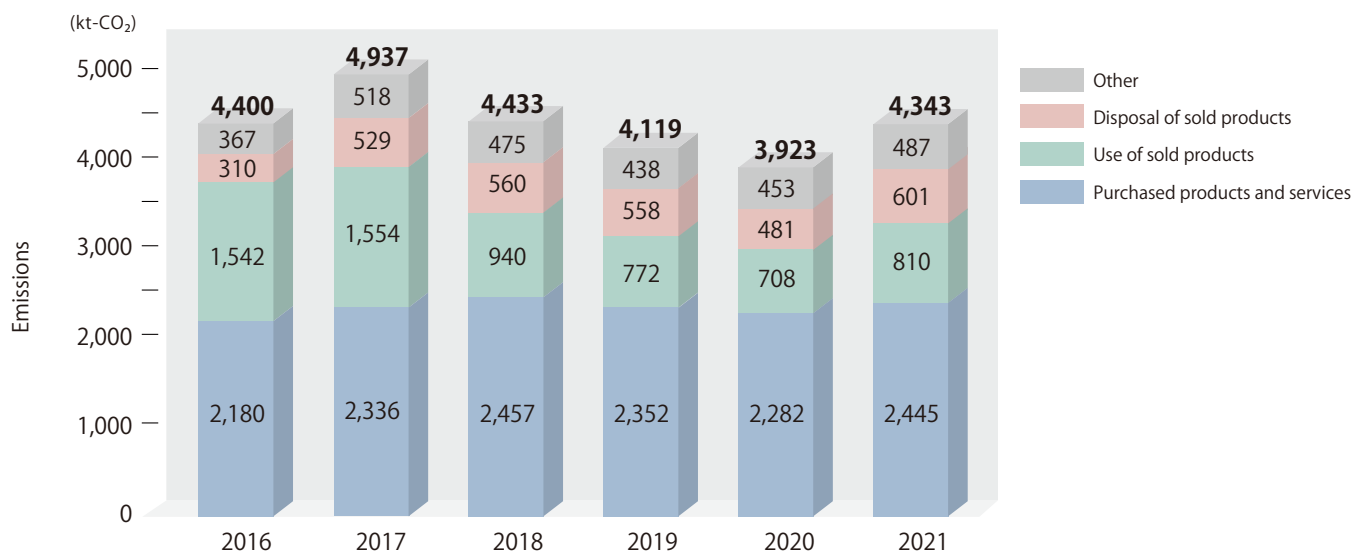


Figure 19: Greenhouse Gas Emissions from the Supply Chain

Since 2018, SEKISUI CHEMICAL Group has been disclosing its efforts on climate change issues in the TCFD Reports.

Recognizing the need for long-term solutions are necessary to address climate change issues, the risks to companies and the risks that companies pose to the external environment are analyzed, and strategies are formulated to mitigate these risks and convert them to opportunities, and promote initiatives.

As the accuracy of scientific predictions improves, there is a need to raise the goals to address climate change issues and accelerate the achievement of targets. In addition to steadily implementing various initiatives to control greenhouse gas emissions, milestones are also being reviewed by examining innovations and measures for acceleration, taking into account the evaluation of scenario analysis published in this report.

Recently, there has been a trend toward assessing risks from a long-term perspective, formulating strategies, and disclosing environmental issues related to resource circulation, water risks, the natural and social capital, and biodiversity that these factors comprehensively affect (TNFD; Task force on Nature-related Financial Disclosure). In this year's report, assessments have been made and reviewed on the impact of on other environmental issues so that climate change risks can be converted into opportunities through better solutions.

Since FY2012, SEKISUI CHEMICAL Group has been aware of the impact of its corporate activities on nature and social capital in its long-term environmental vision. When different social issues, including environmental issues, are solved, "an earth with maintained biodiversity" can be realized. The progress of efforts have been confirmed and evaluated as the SEKISUI Environmental Sustainability Index. In this integrated assessment, a rate of return of 100% or more relative to natural and social capital is achieved and maintained. It is important to understand the impact on biodiversity and plant biomass as part of the efforts to reduce impacts on these two aspects and to bring them closer to positive impacts.

In FY2020, a long-term goal for 2050, the "SEKISUI Environment Sustainability Vision 2050" was formulated including targets for resource circulation and water risks in addition to climate change, and launched initiatives to achieve that goal. With regards to resource recycling, a resource recycling policy was formulated in FY2020, and a roadmap based on it to promote innovation was drawn up. At the same time, measures are being developed to accelerate the conversion of raw materials to non-fossil based materials and recycling of disposed wastes back into materials. In other words, it was recognized that even the issue of resource circulation would affect the natural and social capital used, and vice versa. Based on this recognition, specific milestones are being set and undertake initiatives after examining risks and their impacts.

In the future, it is intended to analyze the risks and impacts of different environmental issues, formulate strategies to accelerate risk reduction, and disclose information on the results of these efforts. It is recognized that promoting such information disclosure not only demonstrates the sustainability of the Group, but is also an important issue in obtaining like-minded partners to solve issues, or to take a leading position in transforming the society.

SEKISUI CHEMICAL Group will continue its sustainability efforts that are integrated with its business activities to realize a sustainable society and the sustainable growth of the Group.