SEKISUI

TCFD

Task Force on Climate-related Financial Disclosures

Report 2021

TCFD Report 2021
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August 2021
SEKISUI CHEMICAL CO., LTD.

SEKISUI CHEMICAL Group's Response to Climate Change (2021): Information Disclosures based upon the TCFD Statement of Support

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This TCFD-based disclosure report details SEKISUI CHEMICAL Group's climate change-related efforts as of FY2021, and is updated from the previous fiscal year's disclosures. The three major updates from the previous year are as follows:

· Adoption of an integrated risk management system (see 3. Risk Management)
· Confirmation of progress on decarbonization, focusing on carbon efficiency (see 4. Strategies)
· Re-assessment of comprehensive corporate values from a multi-stakeholder perspective, using impact-weighted accounting (see 4. Strategies)

Commitment to Actions	As part of our long-term vision, "**Vision 2030**", we recognize climate change as an important issue, and are pursuing initiatives based on strategies that accelerate the ways in which we address this issue through our businesses.
Governance Structure	The Board of Directors makes the final decision on policies and strategies for mitigating negative climate change-related impacts at SEKISUI and expanding our contributions toward solving climate change-related issues. The Board also gives the final approval for policies for grasping and responding to the effects of SEKISUI's businesses on climate change. As part of the decision-making process, discussions are held in the Environmental Subcommittee and policies and strategies, which are based on aggregated company-wide circumstances in regards to climate change, are deliberated by the Sustainability Subcommittee. The Environmental Subcommittee also formulates specific plans, discusses targets and manages progress, based on the policies and strategies decided upon by the Board of Directors.
Risk Management	As part of risk management, we identify risks with a high possibility of leading to "serious company-wide incidents", and have created an ERM*1 framework for sharing and managing these risks throughout the Group. After information on climate change-related risks is collected and evaluated by the Environmental Subcommittee, this information is reported to the Company-Wide Risk Review Subcommittee, along with other risks believed to have serious impact on management, where it is centrally reviewed. Identified company-wide risks, including those related to climate change, as well as risks identified by individual organizations, are shared with and deliberated by the Board of Directors, Sustainability Subcommittee, internal management meetings and other various subcommittees. Climate change risks are approached by the Board of Directors as serious external risks. As part of medium- to long-term strategies, environmental related medium-term are established and policies and countermeasures are taken into consideration when formulating management plans. *1 ERM: Enterprise Risk Management. Enterprise risk management refers to company-wide mechanisms and processes, for company-wide, comprehensive risk management and risk management activities.

Strategies

Four scenarios were established along two axis, with the degree of climate change (2°C/4°C) as one of the axis and social systems that widely affect SEKISUI business fields, such as town planning and energy (centralization/decentralization) for the other. Risks and opportunities were then analyzed for each scenario. This has allowed for confirmation of whether or not strategies are in place to reduce risks in each scenario and transform risks into opportunities. Related activities began in fiscal 2020, based on medium-term management plans that reflect these strategies for reducing risk and capturing opportunities.

The validity of climate change strategies was confirmed using the following two methods:

- Increased carbon efficiency and an analysis of the related environmental and economic performance factors were confirmed.
- Comprehensive profits to multi-stakeholders that take into account the impact of climate change, using impact-weighted accounting, were converted in monetary terms for 'greenhouse gas emissions' and 'contribution to reductions from products that contribute to solving climate change issues'. As a result, an amount equalling 1.5 times that of net income was confirmed.

We plan to further expand our environmental value in the future through use of ESG investment frameworks during financial planning.

Indices and Targets

We have created an environmental medium-term plan, “SEKISUI Environment Sustainability Plan: Accelerate II”, with milestones set by backcasting from the long-term goals of our environmental vision. The following two indices have been set as part of the environmental medium-term plan, to manage progress in relation to climate change.

- Net sales of Products to Enhance Sustainability*2”
- Amount of greenhouse gas emissions (Scope 1, 2 and 3)

While we failed to reach our sales target of 640.3 billion yen (target: 700 billion yen) in fiscal 2020, we did achieve our target for greenhouse gas emissions, both for our own business activities and for the supply chain.

*2 Products to enhance sustainability:
A system for certifying and registering products that contribute significantly to solving environmental and social issues (including issues of climate change), using in-house standards. Products are reviewed by a certification board composed of in-house members to determine whether they meet the qualifications for registration. We also receive advice from outside advisory boards to ensure appropriately high standards and transparency.

List of Initiatives to Address Climate Change

Recent SEKISUI CHEMICAL Group Mitigation and Adaptation Initiatives

: Internal policies or business development
: External items

2017

Mitigation

Began Environment-Contributing Investments (12 billion yen over 3 years) and promoted internal support measures for global warming

[Housing] Began sale of "Smart Power Station GR"

[Resin tatami mats] "MIGUSA" tatami mats received "Cool Japan Award 2017"

[Automotive interlayer films] Mexico plant Began operation of 3rd production line

Adaptation

[Rainwater storage system] Cross-Wave was introduced as a "private sector contribution to climate change adaptation", at COP23 (23rd UN Conference of the Parties on climate change) (Ministry of Economy, Trade and Industry side event)

[BR] Established world-first, revolutionary production technology to transform "garbage" into "ethanol"

[Drainage systems] Began sale of new "Choshin LEVOL" home rain gutters

[Strengthening water infrastructure in emerging nations] Capital participation in Vietnam's Tien Phong Plastic Joint Stock Company

Established 2030 goal of reducing GHGs by 26%

2018

Mitigation

[Automotive interlayer films] Made decision to increase film and raw resin production capacity in Europe (20 billion yen investment)

[Housing] Began sale of new "Smart Power Station FR"

Acquired SBT (Science-Based Targets) certification (first in chemical sector company worldwide)

SCIENCE BASED TARGETS

[At COP24, introduced corporate examples of "our efforts to contribute to greenhouse gases reductions from products through our Global Value Chain" (Official Japanese side event sponsored by Ministry of Economy, Trade and Industry)

Expressed support for TCFD

Adaptation

[Drainage systems] Began sale of new "large-capacity high-drainage systems"

[Rainwater storage systems] "Cross-Wave" included as an example in "Introduction to Climate Change Adaptation Businesses" (based on Fiscal Year 2017 Climate Change Adaptation Effect Visualization Project (Ministry of Economy, Trade and Industry))

[Town and community development] Sustainable town and community development Began "SEKISUI Safe & Sound Project"

Selected as a "climate change A-list" company by CDP

CDP A LIST 2018 CLIMATE CHANGE

Commissioned for comprehensive preventative maintenance and operation of sewer pipeline system (Kashiwa City, Chiba Prefecture)

2019

Mitigation

[Housing] Received Ministry of Land, Infrastructure and Transport Grand Prize for the Global Environment for development and popularization of "energy self-sufficient housing"

[Services] Began electricity trading through "Smart Heim Denki"

Achieved 73% ZEH ratio for new home construction in FY2018

[Housing] Began sale of "New Smart Power Station Series" with increased IoT capabilities

Disclosure in line with TCFD guidelines (Disclosed climate change preparations, risks and opportunities, strategies, etc.)

[Town and community development] Sustainable town and community developmentBegan "SEKISUI Safe & Sound Project", phase 1: "Asaka Leadtown"

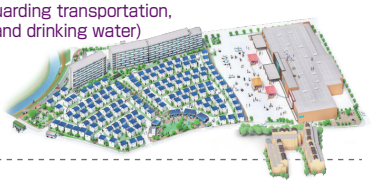
Selected as a "climate change A-list" company by CDP

CDP A LIST 2019 CLIMATE

Release of Ministry of the Environment's "Climate Change Adaptation Guide for Private Sector Business" (SEKISUI consulted with production committee)

[Town and community development] "Asaka Leadtown" listed as an example in "2019 Environmental White Paper"

[Housing] Strengthened Smart Heim resiliency (Safeguarding transportation, power and drinking water)



2020

Mitigation

Established a target of zero GHG emissions by FY2050

Established goal of converting purchased electricity to 100% renewable energy by FY2030

Achieved 80% ZEH ratio for new home construction in FY2019

Joined RE100 RE100 CLIMATE GROUP CDP

Joined "Japan Climate Leaders' Partnership", an industry group dedicated to achieving a sustainable carbon-free society

[Automotive heat dissipation materials] Began operation of new plant in the Netherlands

[Synthetic lumber] Made decision to establish production plant in Europe for FFU for railway sleepers

Successfully switched purchased electricity at 8 business sites to 100% renewable energy

Adaptation

Commenced "Drive 2022" medium-term management plan (40 billion yen ESG investment framework), based on "Vision 2030"

Commenced medium-term environmental plan, backcasting from 2050 long-term environmental vision

Included climate change as a management risk in securities report

Further developed product evaluation system, evolving from "Environment-Contributing Products" to "Products to Enhance Sustainability"

[Housing] Began sale of "Smart Power Station FR GREENMODEL" (Equipped with large-scale solar panels and storage batteries, allowing people to shelter at home during emergencies)

[Town and community development] Sustainable town and community development "SEKISUI Safe & Sound Project" phase 2 Began sales for "Higashimatsuyama Leadtown"

Selected as a CDP A-list company in regards to both "climate change" and "water security"

CDP A LIST 2020 CLIMATE CDP A LIST 2020 WATER

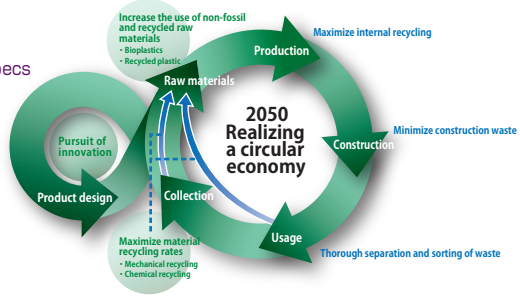
Received highest rank from Development Bank of Japan's "DBJ Environmentally Rated Loan program"

Implemented business site water risk surveys to grasp current conditions

2021

In FY2020, achieved ratio of 85% for new homes constructed with ZEH specs

Released resource recycling policies and strategies



Summary :
As part of our long-term vision, "**Vision 2030**", we recognize climate change as an important issue, and are pursuing initiatives based on strategies that accelerate the ways in which we address this issue through our businesses.

1−1. Positioning of Climate Change Issues

[Long-term Vision]
In 2019, SEKISUI CHEMICAL Group formulated a long-term vision "**Vision 2030**" that expresses the direction of the entire company (Fig.1). In line with this long-term vision, from 2020 we will achieve two principles at a higher level while focusing on ESG management; (1) we will expand our existing businesses by innovating products and businesses, and (2) create new businesses by creating and acquiring new business foundations. SEKISUI CHEMICAL Group aims to double business in 9 years, by 2030, by contributing more than ever to solving issues related to the natural and social environment, including climate change, through our businesses.
Enhancing contributions to problem solving from a long-term perspective is directly linked to "improving social sustainability". In order to realize a more sustainable society, we support the basis of LIFE and will continue to create "peace of mind for the future".

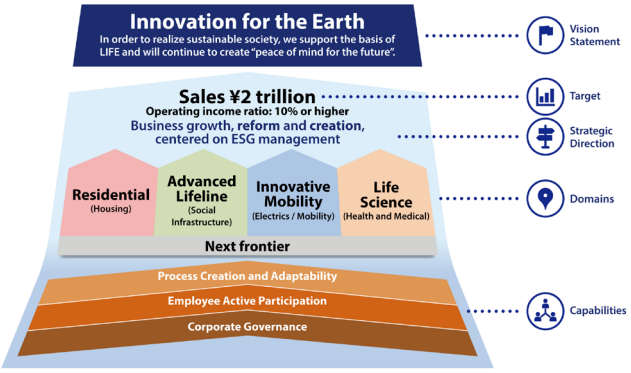


Fig.1 : SEKISUI CHEMICAL Group's long-term vision, **Vision 2030**

[Performance Indicators]
As sustainable management capabilities are required to continue to expand our contributions to solve social issues and grow profits, we established two performance indicators in 2020 for measuring economic and social value.
One of these indicators is the "SEKISUI Sustainable Spread", which evaluates our ability to sustain management by measuring the difference between capital cost reductions and increased efficiency through improved ROIC (both important issues in ESG management).
The other indicator is the "SEKISUI Environmental Sustainable Index"*3, which economically assesses the value that our corporate activities impart to natural capital and social capital in terms of solving environmental and social issues (i.e. our impact on the Earth and society).

The aim of "SEKISUI Sustainable Spread" is to improve ROIC (which indicates the efficiency of business operations in the medium term and onwards) and to solidify management foundations so as to improve the long-term sustainability of management.
Meanwhile, aiming for a "SEKISUI Environmental Sustainable Index" of 100% or greater, even when business volume doubles or more, is a way for us to ensure that SEKISUI CHEMICAL Group can also increase its social value.

*3 SEKISUI Environmental Sustainability Index:
This index quantifies the positive and negative impact on natural capital caused by SEKISUI CHEMICAL Group's business activities and use of natural capital. The index is calculated using the Japanese LIME2 impact assessment method.

[Medium-term Management Plans/Important Issues for Engagement]
As a first step in achieving our long-term vision, SEKISUI CHEMICAL Group has established "**Drive 2022**", a three-year medium-term management plan for FY2020 to 2022. The core philosophy of this plan is to drive sustainable "growth", "reform", and "preparation", so as to double our business and expand our contribution to social issues. This translates to

formalizing ESG management so as to solidify operations, and accelerating the next stages of growth and preparation.
Strengthening governance, DX (digital transformation), environment, human resources, and fusion is an important focus from 2020 and will create the foundation for ESG. Regarding "environment" in particular, the scenarios predicted by the TCFD report prepared the previous fiscal year have made it clear that climate change will have a serious impact on business in both the short and long-term, which will provide both risks and opportunities. In response to this, we have identified climate change as an important area of engagement for achieving the goals of our long-term vision. Additionally, we have established an ESG investment framework for important ESG management related initiatives, including those related to climate change, as part of strategic, long-term management.

[Long-term Environmental Targets]
We recognize "climate change mitigation and adaptation" as important "environmental" issues, and have established an environmental medium-term plan, "SEKISUI Environmental Sustainability Plan – Accelerate II", backcasting from 2050 targets to define issues that must be addressed in the medium-term.
Our approach to environmental issues for 2050, including climate change, is as depicted below: (SEKISUI Environment Sustainability Vision 2050)

Fig. 2: "SEKISUI Environment Sustainability Vision 2050"

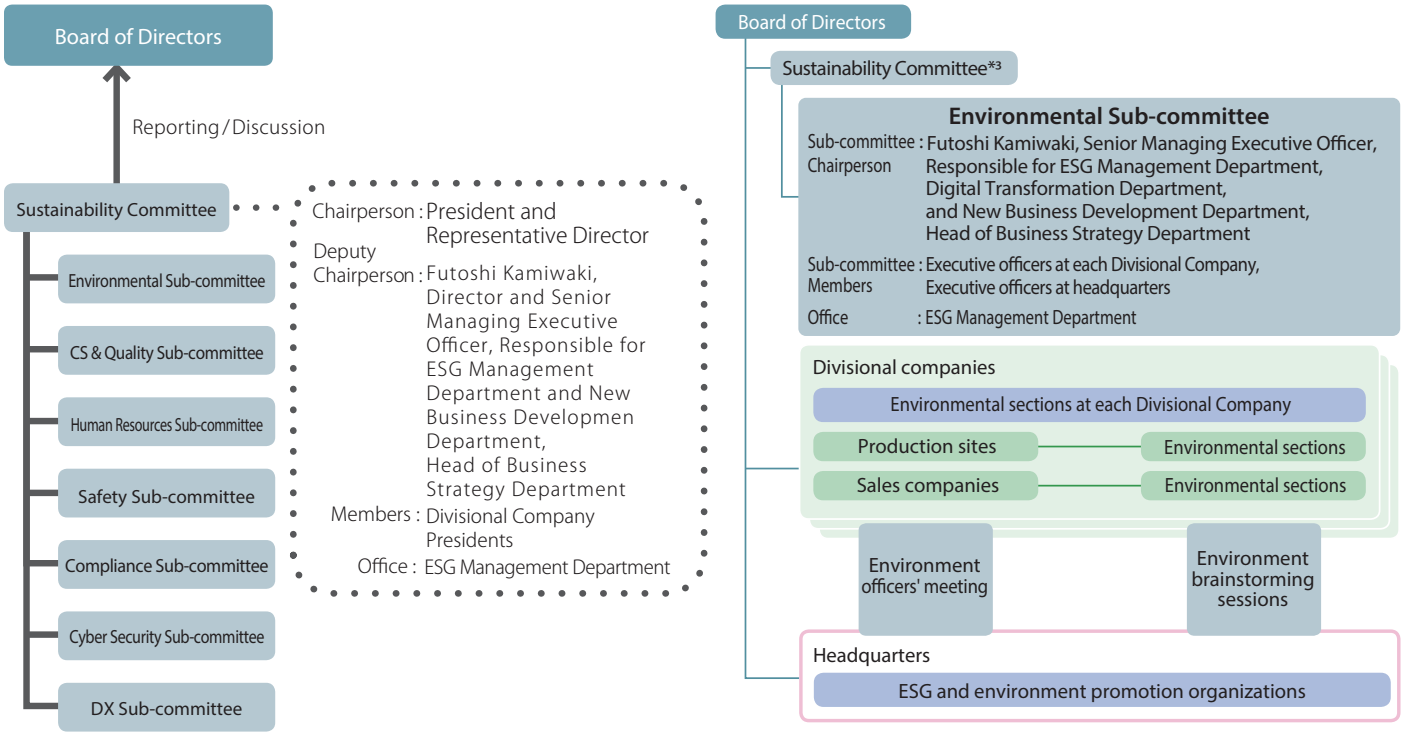
SEKISUI Environment Sustainability Vision 2050
Our vision for the planet in 2050 is one where "biodiversity is maintained" in which many of the issues facing us have been resolved, and biodiversity is maintained in a healthy state. Recognizing that our corporate activities rely on the planet's natural and social capital, we will work to resolve global issues such as climate change, water risks, resource depletion, and ecosystem degradation, and to replenish that capital through three activities: (1) expansion and creation of "products to enhance sustainability"; (2) reduction of environmental impacts; and (3) conservation of the natural environment. In order to achieve these goals and accelerate the balance of natural capital, we will pursue initiatives not only as a company but also in cooperation with our stakeholders.

Summary :
The Board of Directors makes the final decision on policies and strategies for mitigating negative climate change-related impacts at SEKISUI and expanding our contributions toward solving climate change-related issues. The Board also gives the final approval for policies for grasping and responding to the effects of SEKISUI's businesses on climate change. As part of the decision-making process, discussions are held in the Environmental Subcommittee and policies and strategies, which are based on aggregated company-wide circumstances in regards to climate change, are deliberated by the Sustainability Subcommittee. The Environmental Subcommittee also formulates specific plans, discusses targets and manages progress, based on the policies and strategies decided upon by the Board of Directors.

2−1. Oversight by the Board of Directors and Roles of Directors in Evaluating and Managing Risks and Opportunities

In response to external environmental management risks such as climate change, appropriate measures, proportionate to the size of risks, are explored and decisions to act are taken under oversight by the Board of Directors. In order to mitigate negative climate change related impacts and to expand our contributions toward solving climate change related issues, we act in accordance with the governance structure shown in the chart below.

Board of Directors:
Receives reports on company-wide risks and policies/strategies deliberated by the Sustainability Subcommittee, and makes final decisions. Oversees execution of initiatives related to sustainability.
Sustainability Committee:
Deliberates policies, strategies, and major programs for improving social and he Group's sustainability issues including contributions to solving climate change related issues. Also evaluates, identifies and deliberates company-wide risks, including those related to climate change.
Environmental Subcommittee:
Members include officers in charge from divisional companies and headquarters. Discusses implementation of and setting of targets for strategies related to climate change (taking into account business strategies), and manages progress.



(a)Sustainability Committee / Sub-committee Structure (b)Environmental Management Promotion System

Fig. 3 : Governance systems for climate change issues

Ref. : Examples of climate change-related decisions that have been deliberated upon by management

· Initiatives for managing supply chain and application for SBT certification :	August 2017: September	policy meeting, Environmental Subcommittee
· Commitment to support TCFD Recommendations :	November 2018:	management meeting
· Policy to converting 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
· Include content of annual securities report :	June 2020:	Board of Directors
· SEKISUI ESG action plans for FY2021 :	December 2020:	Sustainability Subcommittee
· ESG management guidelines for FY2021, including for climate change :	January 2021:	management meeting
· Creation of policies for greenhouse gas reductions and use of renewable energy :	February 2021	management meeting
· Creation of resource recycling policies and strategies :	March 2021	management meeting
· Content of annual securities report :	June 2021	Board of Directors

Summary :
As part of risk management, we identify risks with a high possibility of leading to "serious company-wide incidents", and have created an ERM framework for sharing and managing these risks throughout the Group. After information on climate change-related risks is collected and evaluated by the Environmental Subcommittee, this information is reported to the Company-Wide Risk Review Subcommittee, along with other risks believed to have serious impact on management, where it is centrally reviewed. Identified company-wide risks, including those related to climate change, as well as risks identified by individual organizations, are shared with and deliberated by the Board of Directors, Sustainability Subcommittee, internal management meetings and other various subcommittees (see 3-1).
Climate change risks are approached by the Board of Directors as serious external risks. As part of medium- to long-term strategies, environmental related medium-term are established and policies and countermeasures are taken into consideration when formulating management plans (see 3-2).

3−1. Integrated Risk Management, Including Climate Change

At SEKISUI, we established an integrated risk management structure that cover both activities to prevent risks from manifesting (enterprise risk management (ERM)) and activities to respond when risks do manifest (crisis management). This integrated approach ensures a mechanism that is always capable of responding to changing risks, as suited to organizational circumstances. (Fig. 4)
As part of risk management, including climate change, risk information is exhaustively collected in speciality fields and overseas region, and evaluated along the two axis of “likelihood” and “consequences”. Using these results, the Company-Wide Risk Review Subcommittee, which includes experts in charge for each field of speciality, carries out a comprehensive assessment and identifies company-wide risks. The Environmental Subcommittee collects and evaluates information on climate change-related risks before reporting to the Company-Wide Risk Examination Subcommittee. Serious company-wide risks identified by the Company-Wide Risk Review Subcommittee are reported to the Sustainability Committee, which is chaired by the president of the company, and the head of Business Strategy Department and ESG Management Department serves as vice-chairman, and the three divisional company presidents serve as committee members. This committee deliberates on policies on countermeasures, major initiatives and target achievement levels. The contents of this deliberation are reported to the Board of Directors, and final decisions are made under the Board's oversight. Identified serious company-wide risks and the related policies and programs are reported to the Environmental Subcommittee and various other subcommittees, which are comprised of relevant members and persons-in-charge from divisional companies and headquarters. Shared company-wide policies are then implemented into action plans at the divisional company-specific level. Furthermore, we pursue an integrated ERM structure that unites company-wide and organization-specific risk management, by reflecting this information in the individual risk management activities of our 171 organizations, including domestic and overseas affiliated companies.

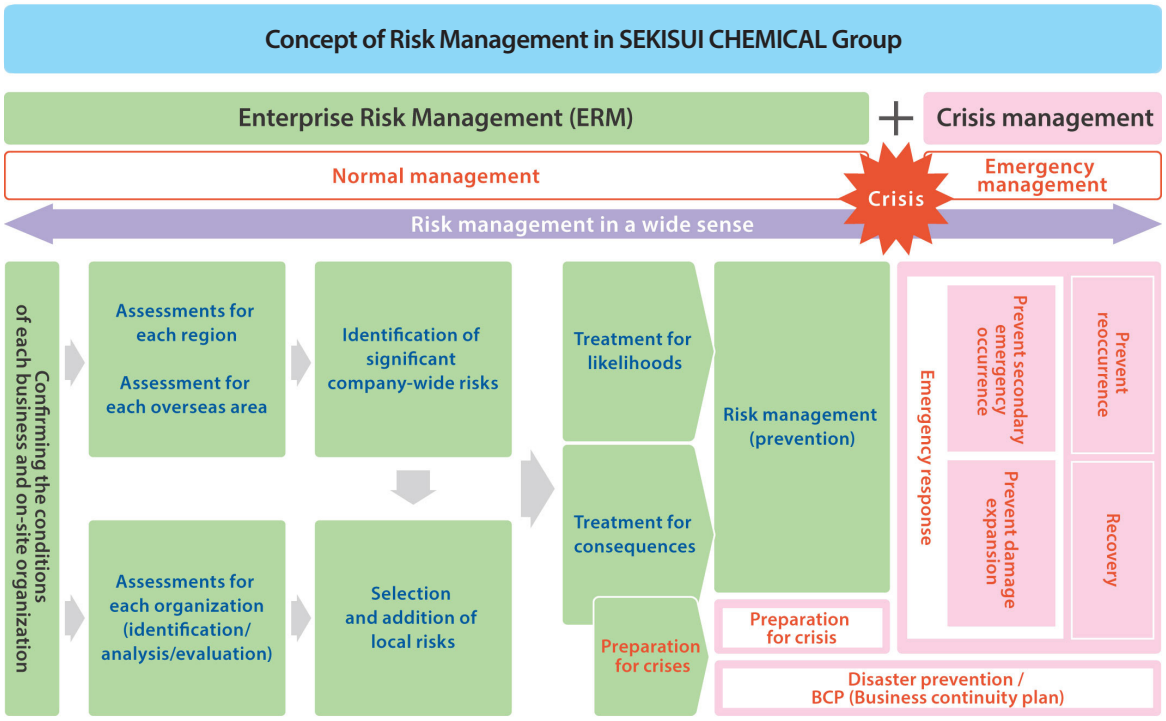


Fig. 4: SEKISUI CHEMICAL Group's risk management program

3–2. Evaluating and Managing Climate Change-related Risks and Opportunities

In regards to climate change, we are investigating steps we can take to become aware of risks and opportunities, reduce risks, and transform risks into opportunities. The Board of Directors recognizes climate change as a serious external risk, and as part of medium to long-term strategies we have established an environmental medium-term plan and consider policies and countermeasures when exploring management plans. We will implement PDCA cycles to pursue climate change-related initiatives, based on the indicators and goals set as part of plans to address climate change-related risks.
Below are current status and future developments in regards to evaluation and control of management risks (including climate change) and climate change-related opportunities.

<Evaluating and Control of Management Risks, Including Climate Change>

Recently, the need to accelerate climate change mitigation and adaptation measures, and to evaluate risks from a more long-term perspective, has increased. As a result, in FY2019, in order to accelerate risk evaluation and climate change measures, SEKISUI carried out risk assessments based on 2°C and 4°C warming scenarios. The risks identified by these assessments are described in the next section (section 4, chart 1). Keeping the results of these assessments in mind, from fiscal 2020 we will begin to explore engagement in businesses capable of transforming risks into opportunities, and will manage progress based on established medium-term management and environmental plans.

<Evaluating and Managing Opportunities Related to Climate Change>

As with similar opportunities presented by other societal and environmental issues, SEKISUI looks for strategies by which it can convert risks presented by climate change into opportunities, by considering how the company can contribute to addressing climate change through its products, businesses and services. SEKISUI relies on panel members and outside experts in our “Products to Enhance

Sustainability Certification Committee*4" and External Advisory Board*5 in these efforts. These business opportunities are listed in the next section (Chapter 4, Table 1). These discussions are shared with executive officers or persons responsible at organizations for business planning and technology development at each divisional company as necessary to facilitate implementation into business strategies. In FY2020, several products that contribute to climate change mitigation were registered, including Soflan-R CFC-free urethane foam, heat dissipation materials for more efficient electronic devices required by 5G technology, and foam tape to provide higher energy efficiency for medium and large size displays. Regarding product registration, external advisors suggested that in addition to expanding contributions toward addressing climate change, we also focus on other environmental issues such as resource circulation and ecosystem degradation. Additionally, we further improved our "Environment-Contributing Products" systems, an internal system for promoting products that contribute in areas such as climate change. The "Environment-Contributing Products" system has been in place since 2006. The improved and renamed 'Products to Enhance Sustainability' program went into effect in 2020. To ensure the sustainability of products that contribute significantly to solving issues related to climate change, we believe it is important to not only increase current contribution levels but also to improve corporate and product sustainability. As a result, a new premium category was created for strategic expansion that also evaluates products in terms of sustainability. We will monitor sales volumes of "products to enhance sustainability" against targets set in medium-term management and environmental plans.

*4 Certification committee:
A committee responsible for certifying products that contribute significantly to solving environmental and social issues, using in-house standards. These committees are composed of executive officers and other responsible persons, who are selected as required by the businesses or technologies in question.

*5 External Advisory Board:
A panel comprising five external experts, as well as the aforementioned certification committee members, and with the executive director in charge of the ESG Management Department serving as the chair, which meets to exchange opinions on registration of Environment-Contributing Products. Board meetings will continue to be carried out from FY2020 and onwards, in order to exchange opinions on the certification of "Products to Enhance Sustainability".

Summary :
Four scenarios were established along two axis, with the degree of climate change (2°C/4°C) as one of the axis and social systems that widely affect SEKISUI business fields, such as town planning and energy (centralization/decentralization) for the other. Risks and opportunities were then analyzed for each scenario. This has allowed for confirmation of whether or not strategies are in place to reduce risks in each scenario and to transform risks into opportunities. Related activities began in fiscal 2020, based on medium-term management plans that reflect these strategies for reducing risk and capturing opportunities.

The validity of climate change strategies was confirmed using the following two methods:
- Increased carbon efficiency and an analysis of the related environmental and economic performance factors were confirmed.
- Comprehensive profits to multi-stakeholders that take into account the impact of climate change, using impact-weighted accounting, were converted in monetary terms for 'greenhouse gas emissions' and contribution to 'reductions from products that contribute to solving climate change issues'. As a result, an amount equalling 1.5 times that of net income was confirmed.

We plan to further expand our environmental value in the future through use of ESG investment frameworks during financial planning.

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. In fiscal 2018, while identifying risks from climate change to SEKISUI and its businesses and reconfirming strategies to prepare for long-term risks, SEKISUI referenced global warming scenarios (RCP 2.6-RCP 8.5) from the recent UN IPCC (Intergovernmental Panel on Climate Change) Fifth Assessment Report (2014) and conducted an impact analysis.

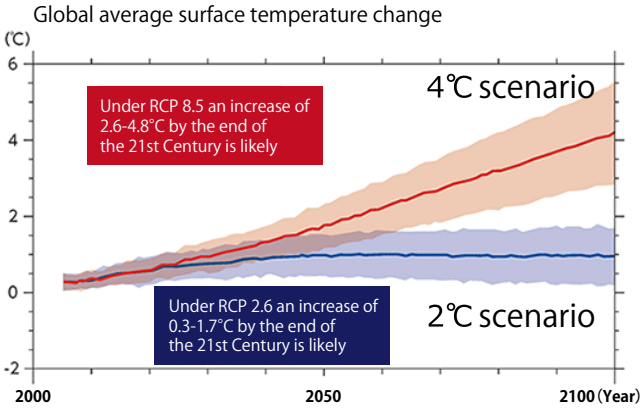


Fig. 5: IPCC climate change scenarios

Scenario	RCP 2.6	RCP 8.5
Surface temperature change	Less than 2℃	4℃ or more
Atmospheric CO_2-eq concentration	Less than 500 ppm	700 ppm or more
Global mean sea level rise	0.4 m	0.7 m
Risks	Regulatory risks	Physical risks

According to the IPCC Fifth Assessment Report, the scenario with the lowest prediction of warming (RCP 2.6) will see a rise of around 2°C. The scenario with the highest prediction (RCP 8.5) will see a rise of around 4°C. When carrying out climate change impact analyses for each business sector, IPCC RCP 2.6 was used for SEKISUI's scenario of 2°C or less and RCP 8.5 was used for SEKISUI's 4°C scenario (Fig. 5). Strategies to prepare for long-term risks were

explored based on these impact analyses. As part of this process, opinions were exchanged between related departments, external experts, internal and external think tanks, and others.
SEKISUI's 2°C and 4°C scenarios were also used as reference when formulating our long-term vision, "**Vision 2030**". We also re-examined transition risks and physical risks for business fields (residential, advanced infrastructure, innovative mobility, life sciences and, as a next-frontier field, energy) targeted for strategic growth for the year 2030 based on 2°C and 4°C climate change scenarios, considering elements such as net sales, operating income, profitability and growth potential.
Impact analysis of possible risks in each business field, and integrated results, are shown in table 1, below. Negative effects with a major financial impact on SEKISUI are regarded as risks, while positive effects are regarded as opportunities.

Table 1: Results of Climate Change Risks Impact Analyses

Type		Climate change risks	Financial Impact	Business risks	Business opportunities	Response / Actions by SEKISUI
Transition	Policy regulations	Carbon tax hike	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 and RE100 membership
		Energy saving/ low carbon regulations	Large	<Short-term> ・Increase in capital investment to strengthen energy conservation and renewable energy <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_2-regulation compliant products	・Establish ESG investment framework ・Develop new energy creation technologies (Ex.: perovskite solar cells) ・Review green procurement standards as appropriate ・Standardize housing with ZEH specifications
		Policy	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	<Short-term> ・Increased need for technologies to reduce CO_2 during waste incineration <Medium- long-term> ・Increase in sales of new homes due to expansion of ZEH market due to from mandatory ZEH specs	・Develop technology for creating ethanol from garbage (Ex.: BR) ・Utilize purchased power after FIT (Ex.: Smart Heim Denki) ・Expand products that enhance sustainability (800 billion yen by 2022)
		Litigation	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 rating systems
	Technology	Replacement to low carbon products	Medium	<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 Environment-Contributing Products that contribute to low carbonization	・Use LCA evaluations in planning, development and marketing ・Use LCA evaluations in marketing ・Explore development of products using bio-derrived materials
	Markets	Change in consumer behavior	Medium	<Long-term> ・Decrease in sale of new cars	<Long-term> ・Increase in profitability from shift to higher-performance products ・Expansion of market for ICT-related products	・Develop highly heat-resistant, high durability and other high performance products ・Develop lightweight PV, heat dissipating products
		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	・Sale of energy self-sufficient stand-alone housing ・Development of resource circulation technologies (Ex.: BR)
	Reputation	Changes in consumer preferences	Medium	<Long-term> ・Decrease in sales due to increased preference for "sharing" over "owning"	<Long-term> ・Creation of new businesses to meet consumer preferences	・Begin services utilizing housing big data (Ex.: SMART HEIM Denki)
		Industry criticism	Large	<Medium- to long-term> ・Investor valuation decline for companies that do not decarbonize	<Short- to medium-term> ・Secure stable financing by demonstrating compatibility with resource circulation	・Utilization of purchased electricity after FIT
Physical	Acute	Frequent typhoons	Large	<Short-term> ・Damage such as increase in plant shutdowns and decrease in sales ・Increase in flooding/flood control costs ・Decrease in sales due to supply chain disruption <Medium- to Long-term> ・Increase in insurance costs	<Short-term> ・Increase in needs for resilient infrastructure ・Increase in sales of products for areas with a high level of water-related risks ・Increase in needs for equipment/facilities for disaster preparedness	・Understand water risks and implement countermeasures ・Develop highly durable infrastructure ・Accelerate infrastructure renewal in developed nations (Ex.: SPR method) ・Expand infrastructural business in developing nations ・Develop disaster response products (Ex.: drinking water storage systems)
		Heavy rain/ droughts	Large			
	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 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	・Encourage changes on the part of raw material suppliers in accordance with procurement standards ・Globally disperse production bases ・Strengthen backup manufacturing systems in accordance with increase in illnesses
		Sea level rise	Medium			
		Rise in average temperatures	Medium			

The "Financial Impact" column in the chart above indicates financial effects, which are graded as low, medium or high according to the effect on related financial indices. The amount of time that risks and opportunities become apparent are shown as short-term (less than 3 years), medium-term (3-6 years) or long-term (6 years or more).

4–2. Analyses of Scenarios (Risks and Opportunities)

<Scenario Analysis Methods and Results>
For the scenario analyses, multiple driving forces (including climate change) that can be expected to impact the future of each business field (residential, advanced infrastructure, innovative mobility, life sciences, and energy field as a next frontier) were identified. Scenarios were constructed, taking future uncertainty into consideration that focus on those driving forces that can be expected to have a significant effect on SEKISUI.
For instance, in innovative mobility, whether or not zero emission vehicles (ZEVs) become mainstream or previous internal combustion vehicles remain the norm could be considered one such driving force. This was considered secondarily in the axis of 2°C vs 4°C climate change scenarios. In the advanced infrastructure field, the advancement of recycling-based society is another possible driving force, and the development of a "recycling society" versus development of a "non-recycling society" was used as an additional data in the axis for 2°C and 4°C climate change scenarios while carrying out analysis.
These scenarios analyses results centered on driving forces that were determined to be highly common in our business sectors were then integrated. The results are shown below. Social systems such as town building and energy sources are represented by the axis affecting business, which stretches from centralized (urban concentration, central management) to decentralized (population decentralization, local consumption). The 2°C and 4°C climate change scenarios serve as the other axis, and resulted in setting four future scenarios for SEKISUI's business in four separate quadrants (Fig. 6).

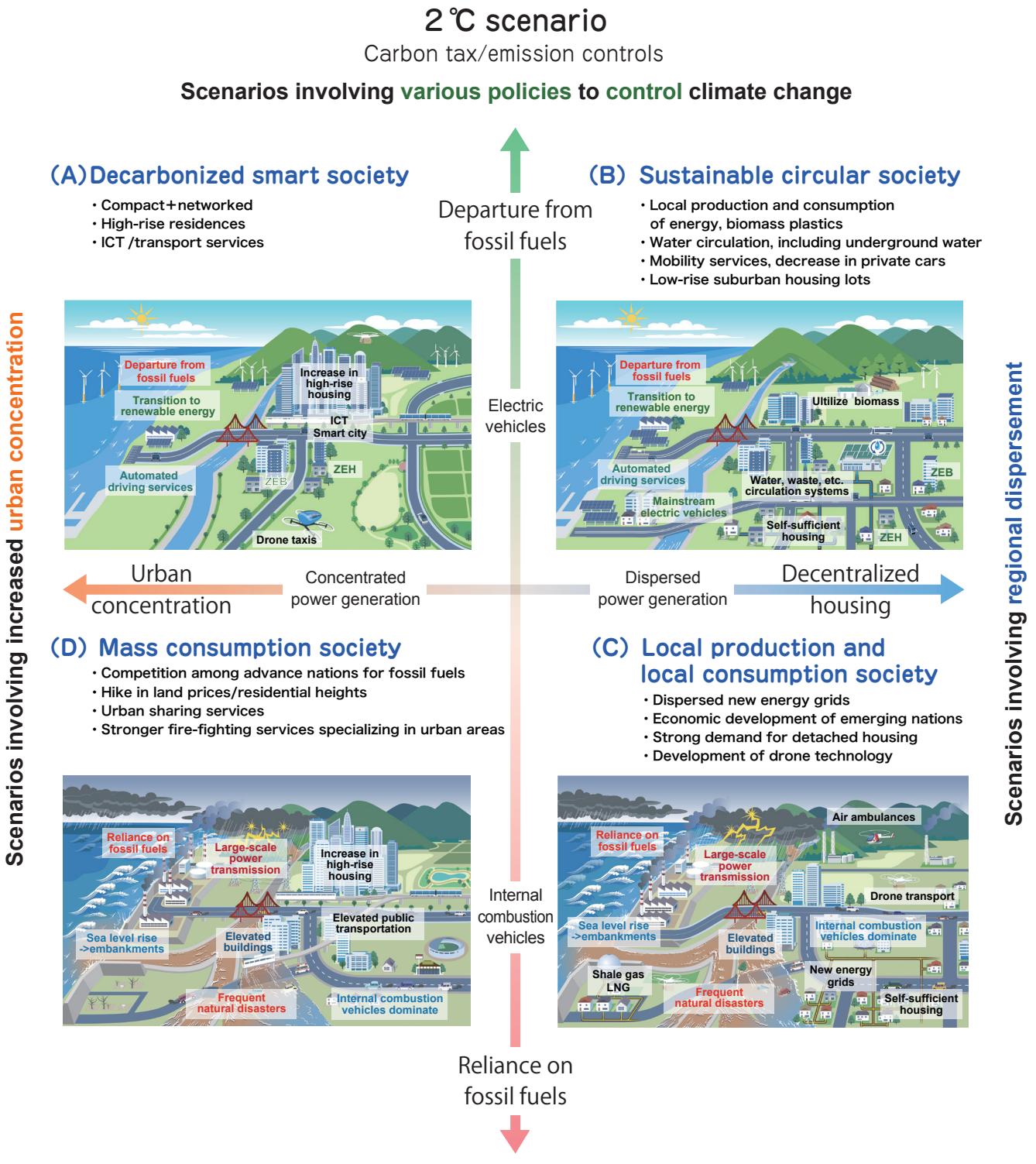
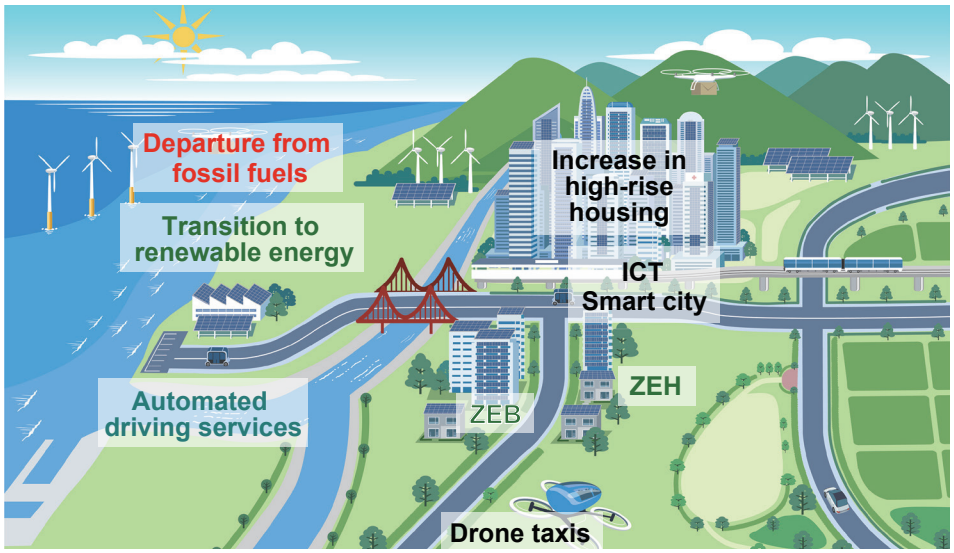
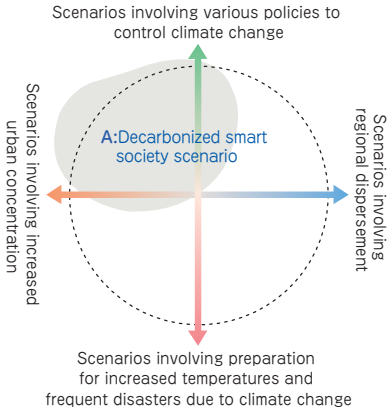


Fig.6: Illustration of four society scenarios

The illustrations below display a societies based on the 4 scenarios (Fig.6). Risk and opportunities for SEKISUI under the four societies envisioned here were analyzed, with the following chart below describing SEKISUI's possible strategies for adapting to each of the societies.

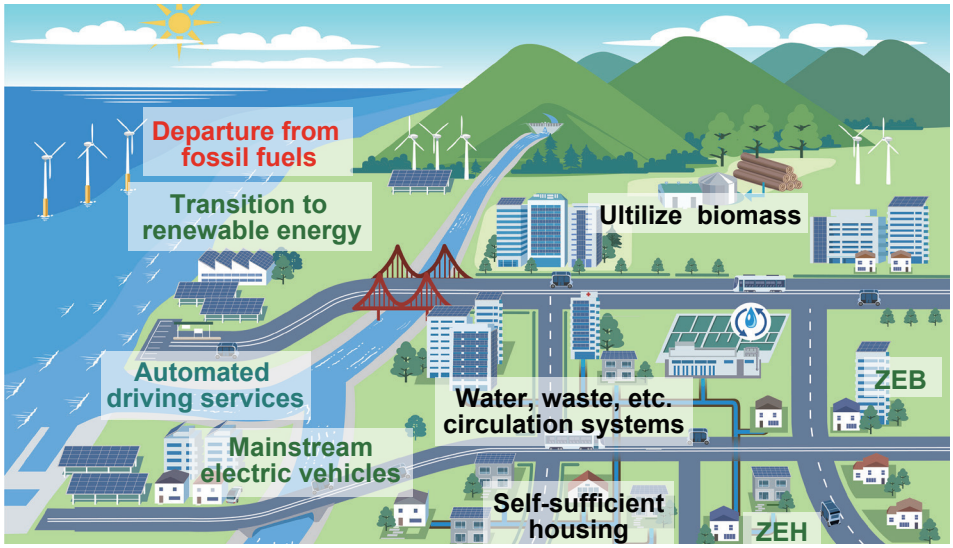
Scenario (A)
Decarbonized smart society scenario (2℃ x centralized scenario)

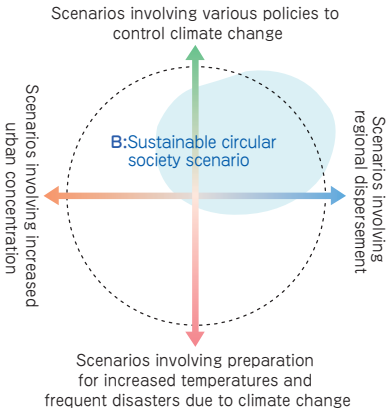




Opportunities	· Increased demand for smart infrastructure, remote control systems, etc. --> Advanced technology utilization and expand services for infrastructure · Increased demand for power generation/storage products -->Higher performance of electronic/energy related products
Risks	· Decreased car sales due to transition to mobility services -->Decreased sales of housing and mobility related products · Transition to renewable energy -->Increase in energy procurement costs · Decreased demand for low-rise housing -->Decreased sales of housing related products
SEKISUI response	[Production activities] Begin converting to renewable energy (introduction of megasolar (USA), SMART HEIM Denki) [Housing business] Standardize ZEH specs [Energy] Begin storage battery business [IT] Material development to promote improvement of ICT(heat dissipating materials, materials for LED and OLED)

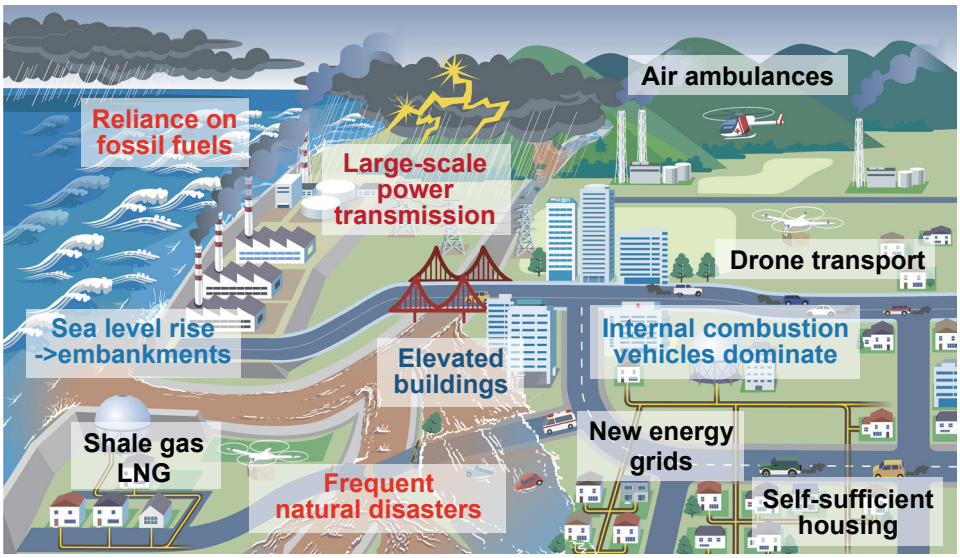
Scenario (B)
Sustainable circular society scenario (2℃ x dispersed scenario)

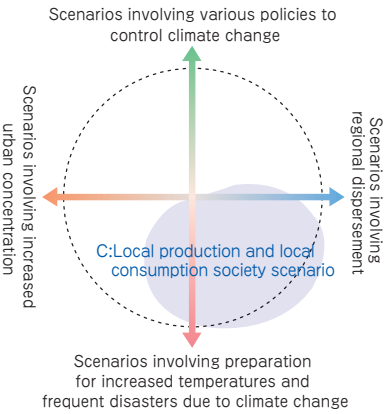




Opportunities	· Localized power generation -->Increased demand for power generation, storage and related technologies · Expanded circulation of resources such as electric power, water, carbon, etc. -->Increased demand for circulation infrastructure · Increased demand for housing with ZEH specs
Risks	· Decreased car sales due to transition to mobility services -->Decreased sales of housing and mobility related products · Transition to renewable energy -->Increase in energy procurement costs · Decreased reputation among customers and investors due to failure to decarbonize
SEKISUI response	[Production activities] Begin converting to renewable energy (introduction of megasolar (USA), SMART HEIM Denki) [Housing business] Standardize ZEH specs [Energy] Promote the spread of energy self-sufficient housing (PV, storage batteries) Also contribute to local energy production and consumption through TEMS [Vehicles] Provide high performance materials with new functions, that support the functionalization of vehicles and aircrafts. (S-LEC wedge-shaped HUD interlayers, KYDEX sheets, CFTRP) · Establish technologies for CCU systems (BR)

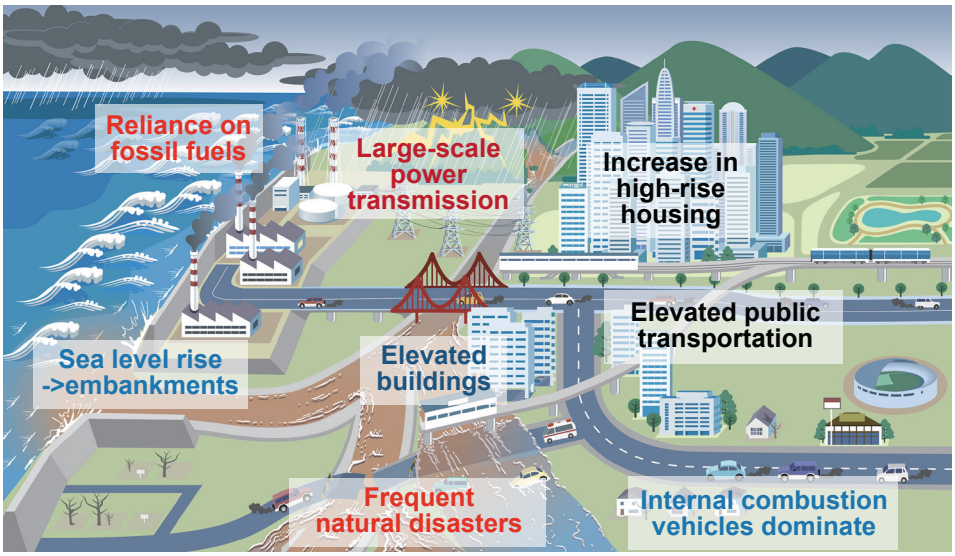
Scenario (C)
Local production and local consumption society scenario (4℃ x dispersed scenario)

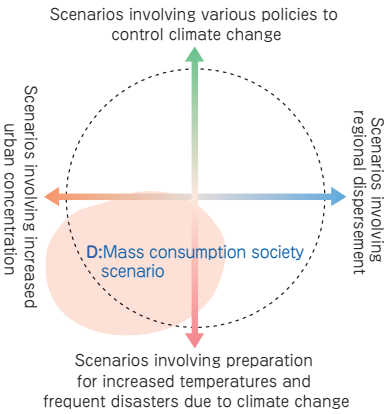




Opportunities	· Promoting resilient infrastructure and autonomous driving infrastructures -->Increased sales of highly durable infrastructure materials and construction services · Creation of market of new energy grids -->Needs for control systems and energy infrastructure technologies
Risks	· Increased 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 · Increased human cost due to increase in diseases caused by global warming · Extensive damages due to fragmentation of infrastructure in the area
SEKISUI response	· At the level of managers of operating companies and business establishments, grasp risks in each area and organization, formulate BCP, and study 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") · Strengthen contract manufacturing system for pharmaceutical products · Explore HEMS and other TEMS technology for building smart grids (SMART HEIM Denki) · Develop urban planning businesses (expand services)

Scenario (D)
Mass consumption society scenario (4℃ x centralized 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
SEKISUI response	· At the level of managers of operating companies and business establishments, grasp risks in each area and organization, formulate BCP, and study 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") · Strengthen contract manufacturing system for pharmaceutical products · Contribute to more stable power transmission by burying grids underground ("CC-Box")

<Summary of Scenario Analyses>
SEKISUI CHEMICAL Group housing and infrastructure related products are all designed to be highly durable and resilient against disaster. In the above-mentioned 4°C scenarios (C) and (D), the durability of these products and SEKISUI's renewal methods for existing infrastructure will contribute to solving climate change issues and likely lead to business expansion. In the 2°C scenarios (A) and (B) where greater mitigation is pursued, many business opportunities will be available; such as solar-equipped housing (which helps to reduce greenhouse gas emissions and promote conversion to renewable energy), new energy production technologies, and development of new materials to drive energy efficiency for aircraft and automobiles.

In addition to climate change, many factors, such as technological development in various industries, remain uncertain. However, whether the world progresses toward a more centralized or decentralized society, this analysis has confirmed the need for SEKISUI to prepare to convert risks into opportunities, be it through development of products designed to address risks that will likely occur with centralization or of technologies that will be necessary for decentralization.
The spread of COVID-19 has already caused significant changes in lifestyle, and can be expected to cause more still. The impact assessments we have carried out in regards to the scenarios above are also applicable to many of these changes.

4–3. Validating Climate Change Strategies

We have confirmed the validity of strategies for addressing climate change issues.
An analysis of comprehensive income from a climate change initiative and multi-stakeholder perspective is shown, using impact-weighted accounting, with (1) comparison of carbon efficiency (which shows the effect of climate change mitigation and adaptation initiatives on management), i.e. environmental performance, vs. economic performance, and (2) consideration for the effects of greenhouse gas emissions, reductions from products that contribution to mitigation and adaptation, etc. in this year's profits.

<Effects of Climate Change Initiatives on Management>
Effects are shown using the following two indicators of the relationship between greenhouse gas emissions and net sales/EBITDA*6, "net sales per unit of carbon" and "profit per unit of carbon".

(a) Relationship between financial indices and "greenhouse gas emissions from business activities"

SEKISUI has been voluntarily engaged in reducing greenhouse gas emissions for some time. In 2017, we established long-term goals for 2030 and created a road map to low-carbonization.
We have established a more ambitious long-term goal to reduce greenhouse gas emissions to zero by 2050 and are pursuing a decarbonization strategy in our business activities, with clear milestones.
Carbon efficiency expresses the relationship between financial indices and greenhouse gas emissions. Both net sales per unit of greenhouse gas emissions from business activities and EBITDA per unit of greenhouse

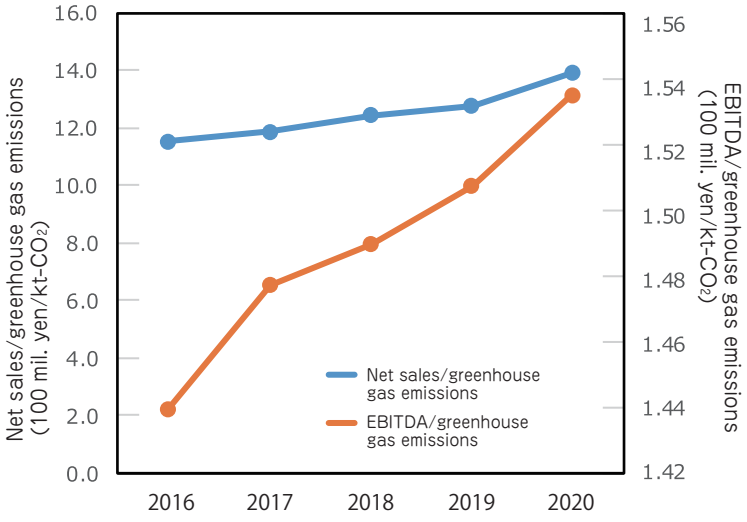


Fig. 7 (a) Carbon efficiency in our business activities

gas emissions from business activities show an increasing trend (Fig. 7-(a)). This demonstrates that our management, based in voluntary decarbonization strategies, is moving in a positive direction, expanding operations and sales while reducing external risks by contributing to mitigating and solving climate change issues.

In preparation for reaching zero greenhouse gas emissions by 2050, we have now begun exploring moving up our 2030 milestones. By re-strategizing and further expanding policies, we will pursue long-term low-carbon management while confirming that indices (carbon efficiency) are trending in a positive direction.

(b) Relationship between financial indices and greenhouse gas emissions throughout the supply chain

In the previous section, we described an analysis of low-carbon management in our business activities. However, we have also analyzed greenhouse gas emissions throughout the entirety of our corporate activities, including throughout the supply chain. This analysis shows that, while in comparison to our own business activities, the increase in carbon efficiency throughout the supply chain is lower, environmental impact (greenhouse gas emissions) has been reducing, and profits have been increasing throughout the supply chain (Fig. 7-(b)). However, a slight downturn in carbon efficiency/profits for the supply chain was apparent in fiscal 2020, possibly due to COVID-19.
We believe that continued initiatives, as well as deploying policies based on new strategies as shown below, will be effective in increasing carbon efficiency.

· In 2017 we acquired SBT certification, and have established long-term targets and begun carrying out activities to reduce Scope 3 emissions. In order to improve our sustainable management abilities and to mitigate the serious environmental issues of climate change, we believe it is important to strengthen supply chain management, and began to focus on doing so in fiscal 2020 as part of medium-term management plan and environmental plans.
· We are pursuing decarbonization of raw materials by working together with our resin suppliers, as well as striving to reduce greenhouse gas emissions from products through increased sales of ZEH housing. With the latter, in particular, in FY2020 we were ahead of schedule on our sales ratio of houses with ZEH specs, having already reached 85%.

In the future we expect to further decrease greenhouse gas emissions and further increase profits, for instance by continuing to pursue use of non-fossil based raw materials in the IT and automotive fields, or by helping to realize a society based around recycled materials that maintain high performance and equal or better quality through mass implementation of our bio refinery (BR) technology for creating ethanol from waste, using the power of microbes.
We will continue to monitor our activities as described above, so as to evaluate whether efficient, low-carbon management initiatives have been successfully implemented for our supply chain.

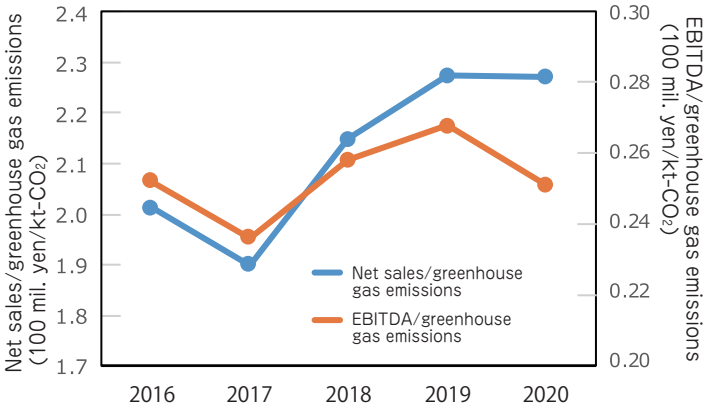


Fig. 7 (b) Carbon efficiency throughout our supply chain

Ref. Calculation method for each index
· Net sales/greenhouse gas emissions (net sales per carbon=100 mil. yen/kt-CO_2)
· EBITDA/greenhouse gas emissions (profit per carbon=100 mil. yen/kt-CO_2)

*6: EBITDA=Earnings Before Interest, Taxes, Depreciation and Amortization

<Comparing Environmental and Economic Performance in Management>

Additionally, in order to verify climate change initiatives and their effect on management, profitability per unit of carbon is factored using the following two indices. (Data for greenhouse gas emissions from business activities are used here.)

EBITDA/greenhouse gas emissions=(EBITDA/net sales) × (net sales/greenhouse gas emission)

- EBITDA/net sales(profit per net sales=100 mil. yen/100 mil. yen) ..... economic performance
- Net sales/greenhouse gas emissions (net sales per unit of carbon=100 mil. yen/kt-CO_2) ..... environmental performance

Of the two indices above, EBITDA/net sales represents an economic performance, and net sales/greenhouse gas emissions represents environmental performance (Fig. 8). By looking at the correlation between these two indices, we can see that net sales per carbon through fiscal 2020 has increased while maintaining stable profits. While physical and regulatory risks are predicted to increase, if an economically profitable strategy can be deployed that reflects this increase in net sales per unit of carbon, risks can be converted even further into significant opportunities. From this correlation, we are also able to reconfirm increased future potential profitability in comparison to current profitability.

As shown in the figure, in order to meet our fiscal 2030 goal under the long-term vision, it appears we will need to accelerate this increase in profitability versus carbon through increased innovation and initiatives (Fig. 8). We have already begun initiatives to switch to 100% renewable energy for all purchased electrical power by 2030, and we also believe improving profitability per unit of carbon by further accelerating this progress will be an important step in decarbonization.

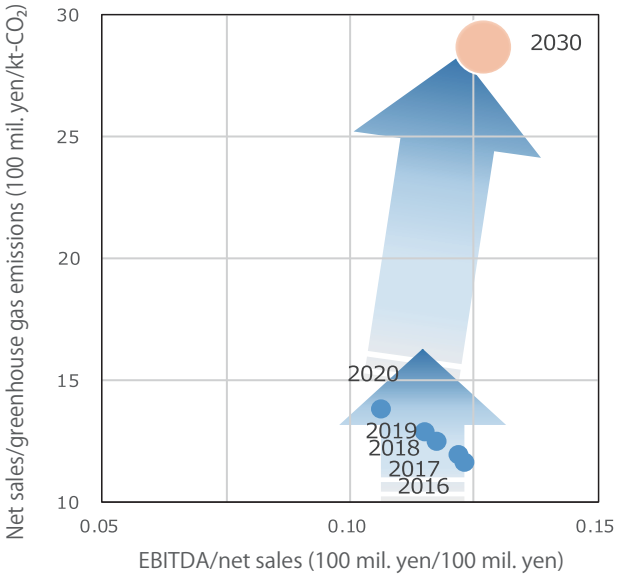


Fig. 8: Correlation between economic and environmental performance

(Greenhouse gas emissions: greenhouse gas emissions from business activities is used)

<Comprehensive Income Using Impact-Weighted Accounting*[7]>

Climate change affects the entire planet. Likewise, our climate change initiatives can be considered to affect not only our shareholders, but a multitude of stakeholders including customers, business partners, employees and global society. Therefore, we consider it important to more thoroughly and comprehensively consider effects on multiple stakeholders, and conducted analyses using impact-weighted framework. The results of these analyses are explained below, but we believe that the sustainability of our climate change initiatives for SEKISUI and for society can be determined by considering the effects on multiple stakeholders.

When considering the impact of climate change on the company, corporate value can be calculated by taking profits from business activities, adding the "positive effect on the external environment (value of contribution to reduction of greenhouse gas emissions by products)", and subtracting the "negative effect on the external environment (impact of greenhouse gas emissions from business activities)". The latter two were calculated using

the LIME2 to convert to monetary values. Additionally, the efforts of each and every employee are required for solving climate change issues in our company. The costs required to employ members who promote climate change initiatives could be considered a part of corporate value from the perspective of other stakeholders.

Comprehensive income based on impact-weighted accounting = (operating income after tax + employment costs for employees who implement climate change initiatives + economic value of product contributions to greenhouse gas reductions + economic value to the environment achieved by products in relation to issues other than those of climate change) - (economic loss due to greenhouse gas emissions from business activities + economic loss to the environment from business activities in relation to issues other than those of climate change)

The results of analyses based on the above formula is shown in fig. 9. In fiscal 2020, we achieved a comprehensive income approximately 1.5 times the net income through climate change initiatives and low-carbon management. "Impact-weighted comprehensive income" can be returned to multiple stakeholders, such as profits to stakeholders and job creation to employees without losing value even when considering external environment. Moving forward we will be able to increase comprehensive income even further by increasing the value of employees carrying out such activities, increasing the value of product contributions to emission reductions through innovation, and decreasing greenhouse gas emissions from business activities.
For instance, we believe that creating innovation can contribute to reduce emissions through our products and we have been making R&D and capital investment in the following technologies: practical implementation of the BR (biorefinery) ethanol technology, perovskite solar cells, CCUS technologies, and improving durability of infrastructure products, etc.

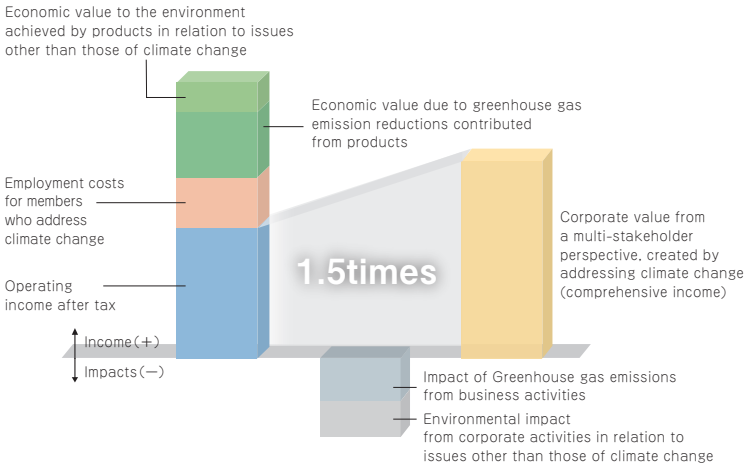


Fig. 9: Overview of impact-weighted analysis, with consideration for the economic value of greenhouse gas emissions (Based on FY 2020 results)

*7 Impact-weighted accounts:
An approach promoted by Harvard Business School Professor George Serafeim to grasp value for all stakeholders, combining accounting and impact by quantitatively calculating total stakeholder impact in monetary terms, in addition to calculating profit for shareholders.
Here, this is taken to include the addition of the product impact of climate change on profits and the employment impact of climate change initiatives, and the subtraction of environmental impact from greenhouse gas emissions.

Additionally, the corporate value (comprehensive income of impact) to multiple stakeholders can be broken down into product life cycles as positive and negative impacts as shown below.

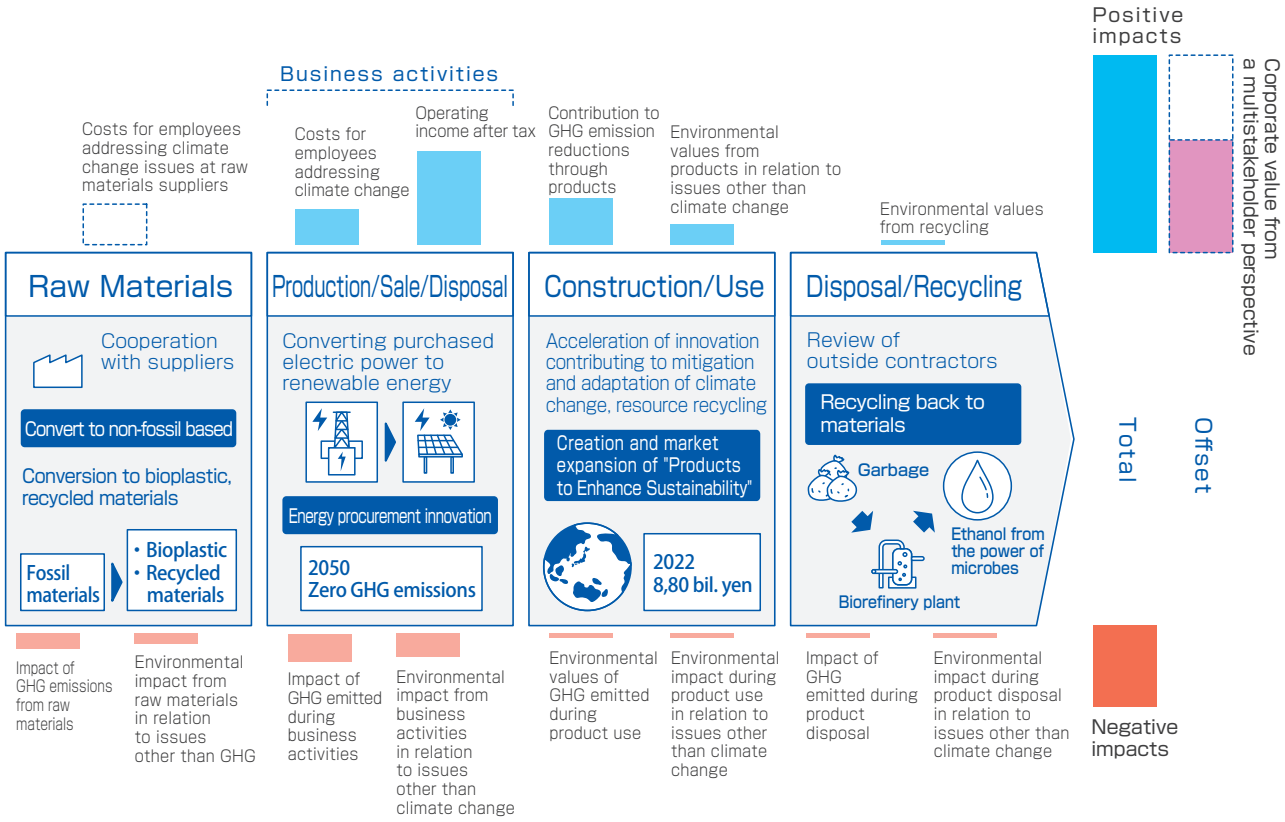


Fig. 10: Overview of corporate value in the product lifecycles using impact-weighted accounting (Based on FY2020 results)

[Reference]

Comprehensive income from a multi-stakeholder perspective = positive impacts - negative impacts

Break down of impact by each stage of the lifecycle:

<Positive impacts>

- Operating income after tax
- Employment costs for employees who implement climate change initiatives
- Economic values of product contributions to greenhouse gas reductions
- Environmental values achieved by products in relation to issues other than those of climate change
- Environmental values from resource recycling

<Negative impacts>

- Impact of greenhouse gas emissions from raw materials
- Environmental impacts of raw materials in relation to issues other than those of climate change
- Impact of greenhouse gas emissions from business activities
- Environmental impacts of business activities in relation to issues other than those of climate change
- Impact of greenhouse gas emissions during product use
- Environmental impacts during product use in relation to issues other than those of climate change
- Impact of greenhouse gas emissions from disposal of products
- Environmental impacts from product disposal in relation to issues other than those of climate change

The purpose of use of each impact is as follows:

- Operating income after tax : Used as a financial index to express the value returned to stakeholders such as shareholder and investors.
- Employment costs : Used as a financial index to express the value returned to employee stakeholders.
- All other impacts : Used as a non-financial index expressing the values returned to the global environment and local communities, which are stakeholders.

In addition to the values indicated by financial indices, impact-weight analysis as described above allows us to recognize where positive impacts are created for multiple stakeholders as well as where negative impacts occurred in the external environment. This also allows us to confirm that current initiatives, planned policies, etc. are contributing to increase corporate values by increasing the positive impacts and decreasing the negative impacts of each process.

Going forward, in order to solve climate change issues, we will continue to establish strategies and implement initiatives in our management that further increase positive and reduce negative impacts.

4–4. Explanation of Effect of Climate Change-related Risks and Opportunities on Organization's Businesses, Strategies and Financial Plans

< Effect of Climate Change on Business and Strategies >

Climate change risks can be opportunities as well. We establish strategies and plans to reduce risks and convert them into opportunities for medium and long-term climate change, in terms of products and services, supply chains or value chains, R&D investment, and operations. Initiatives based in these strategies will also lead to improvement of corporate value and comprehensive income, as described in the previous section.

Examples are shown below for each category.

[Reference] Examples: Reduction of climate change risks and conversion to opportunities

[Resource Recycling Strategy]

In fiscal 2020 we created a resource recycling policy, set long-term targets, and established a resource recycling strategy and roadmap. These are vital strategies for promoting climate change mitigation through the lifecycle and shifting to low-carbon products.

The resource recycling strategy and roadmap are illustrated below.

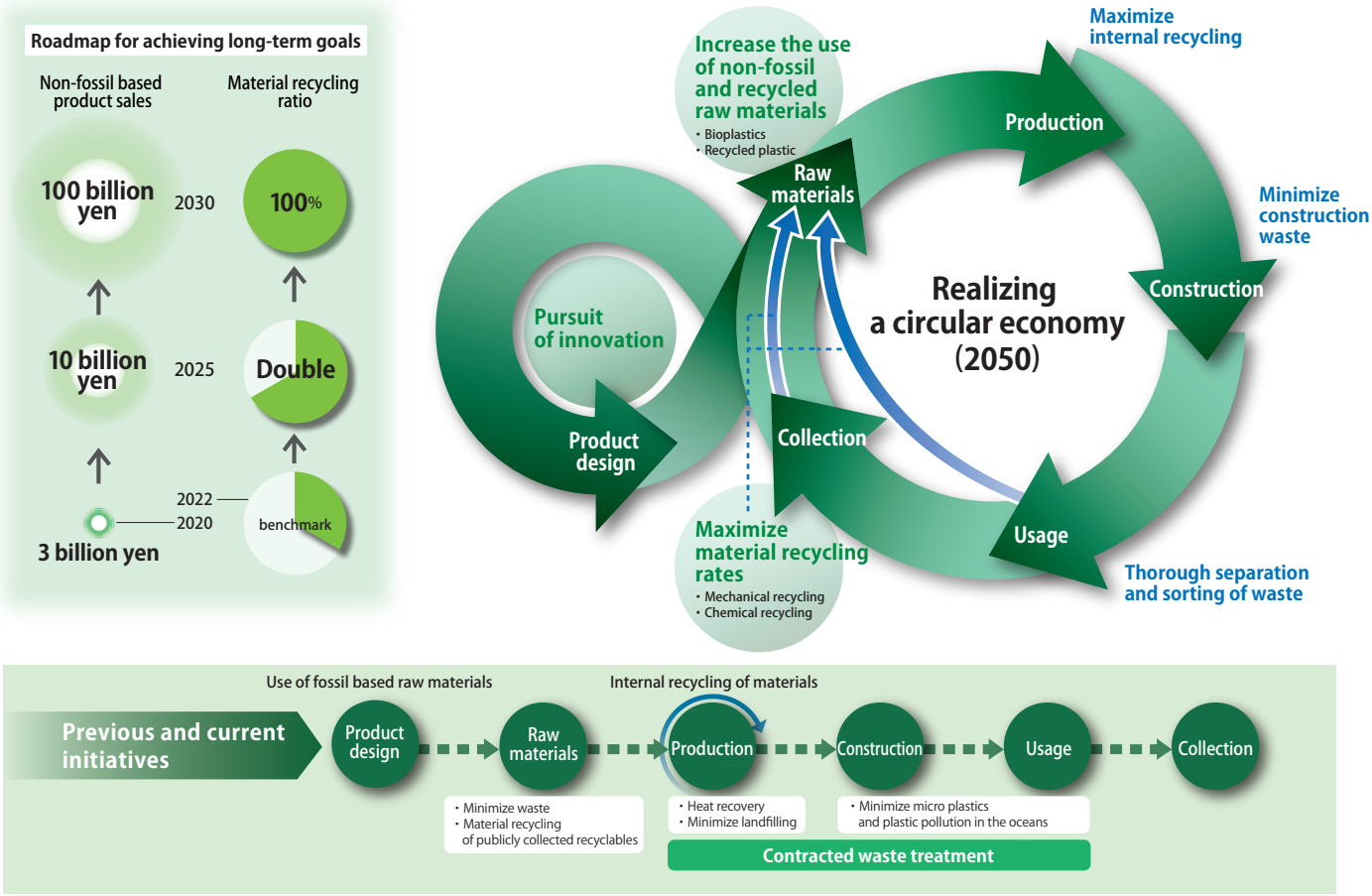


Fig. 11: Resource recycling strategy

Plan for Long-Term Goal Achievement

		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
Raw material resource conversion	**Net sales of products not derived from fossil fuels and using recycled materials**	3 billion yen	10 billion yen	100 billion yen
Recycling waste products	**Rates for recycling waste plastic into new materials**	Grasping current conditions and setting benchmarks	2 times	100%

[Products / Services]

Examples of products and services are listed below.
SEKISUI Group has prepared for disasters by installing cogeneration-based electrical power generation systems for in-house use at a few key manufacturing plants.

Example 1: SMART HEIM Denki

In the housing business, as one strategy for mitigating climate change, SEKISUI began offering homes equipped with solar panels from an early stage. Conversion to renewable energy had been recommended in Japan as a mitigation measure. During the initial phases, subsidies and other programs such as the FIT scheme offered by the Japanese government (scheme were surplus electricity purchased back) were available to promote those conversions. SEKISUI CHEMICAL Group's SEKISUI Heim housing uses a flat roof design suited for factory production, which allows renewable energy-producing solar panels to be installed over a larger area. This greatly reduces CO_2 during housing use while also contributing to daily savings of electricity costs for the resident.

Possible risks

Regarding electricity generated by solar panels, if the FIT scheme comes to an end, the lack of such incentives may impede further spread of solar panels.

Conversion to opportunities

To promote effective use of renewable energy, SEKISUI CHEMICAL Group began purchasing surplus electricity generated by our customers with solar-equipped housing via our Smart Heim Denki Business, which we then use in our factories that manufactures those houses. We also made the decision to start business to develop services by which other customers may make use of this energy as well.

Example 2: Housing adapted for climate change

Possible risks

In recent years the effects of climate change have not been limited to only invisible regulatory risks, but now include more visible physical risks as well, such as water damage occurring from a variety of extreme weather events in areas all around the world, including Japan. Housing that contributes to mitigation offers a variety of merits, such as economic benefits for the resident and the ability to mitigate global warming for society, whereas demand for housing with low disaster resiliency and other insufficiently designed services can be expected to fall off naturally.

Conversion to opportunities

SEKISUI Heim housing is highly reliable, durable and built to be disaster-resistant, which contributes directly to climate change adaptation. Modular housing that is produced

largely in factories is well suited for adaptation, both in terms of production and construction. Such housing is less likely to be affected by climate change and can also be quickly provided as temporary housing in the event of evacuations caused by climate change-related disasters. Not only can SEKISUI's highly reliable and trustworthy SEKISUI Heim homes help to reduce the physical and mental stress of evacuation and support recovery, but after evacuation ends the housing can also be relocated and reused, after some necessary maintenance. This can contribute to recycling and to disaster recovery efforts.
Outfitting SEKISUI Heim housing with highly insulated and airtight air conditioning systems such as “Kaiteki Airy” ensures comfortable living with relative small energy footprint, despite warming effects from climate change. These air conditioning systems also prevent viruses from spreading indoors, which can help to prevent the transmission of infectious diseases.
As mentioned previously, sales ratio of housing with ZEH specs exceeded 80% in FY2020. Equipping houses with batteries to store electrical power created by solar panels prevents disruptions to lifestyles that could be caused by frequent natural disasters due to climate change. SEKISUI developed and proposed designs of houses and services as follows, with the aim of utilizing storage batteries to safeguard utilities during times of disaster. Battery installations increased in 2019 due to efforts such as (1) increased capacity while making the size of the batter more compact, and (2) proposed design changes where batteries can be installed indoors or on the second floor to ensure they remain undamaged during floods, heavy storms, etc.
Additionally, by having customer use the “V to H” (Vehicle to Home) systems that connects solar-equipped homes with electric vehicles, it will be possible for residents to evacuate for safety or transport goods even when power is lost during a disaster. We will continue to promote disaster resilience facilities and services such as these, which contribute to climate change adaptation.

Example 3: Disaster-resilient town development

Possible risks

Adapting to the risks of water damage due to the effects of climate change requires more than just improving individual homes for better adaptability. The resiliency of entire towns and regions is also required.

Conversion to opportunities

In 2018, we started the SEKISUI CHEMICAL Group's town development "SEKISUI Safe & Sound Project" in order to think what resilient town development is and to consider a town development business by integrating our technologies solve necessary issues. The first of the town development model projects was "Asaka Lead Town," which was developed in Asaka City, Saitama Prefecture, and housing lots were put up for sale in 2019.
These towns are equipped with products such as SEKISUI RCP pipes and Cross-Wave rainwater storage systems, providing temporary storage for rainfall during heavy rains or typhoons, thus helping to prevent flooding of the area and homes. To reduce flooding damage and support disaster-recovery efforts, we also installed “emergency toilet systems” at parks, schools and other evacuation sites in many areas.
As we continue to carry out unique town management and pursue “town development” that increases community value, we have also already begun implementation of eight other projects in the current and upcoming medium term, with a total project cost of around 50 billion yen.
In turn, we have planned for a sales volume of 12 billion yen for fiscal 2022.
We started sales in the "Higashimatsuyama Leadtown" (Higashimatsuyama City, Saitama Prefecture) in October 2020.

Example 4: Promoting resilient infrastructure in advanced countries

Possible risks

As risks of water disasters increase from climate change increase, more resilient infrastructure, such as water and sewer pipelines are required. Water-related risks, in particular, affect some regions much more so than others. In advanced countries, aging infrastructure that has been in place for 50 or more years is common, and

construction methods to renew aging infrastructure, that use less energy and materials, and short construction time to minimize service outages, are required.

Conversion to opportunities

We aim to further popularize trenchless construction methods, such as the SPR Method, and are developing semi-automated construction machines and technologies compatible with different size and shape pipelines.

[Supply Chain / Value Chain]

Examples of supply chain and value chain are listed below.

Example 1: Raw material suppliers

Possible risks

As regulations to mitigate the effects of climate change are tightened, suppliers will also need to review their manufacturing processes and energy consumption. If working with suppliers is left until later, there is a risk that manufacturing costs could temporarily increase significantly and lead to instability in raw material prices.

Conversion to opportunities

Beginning in FY 2018, to stabilize raw material procurement and mitigate climate change on a global level, SEKISUI began using procurement guidelines to encourage raw material suppliers to establish greenhouse gas reduction targets and reduce emissions. Furthermore, to mitigate the risk of raw materials companies halting supply due to natural disasters caused by climate change, SEKISUI has established procurement networks that utilize multiple raw material suppliers. SEKISUI is also looking into relocating production bases, from regions where natural disasters and other physical risks are predicted to be high, to regions where those risks are lower.

Additionally, we believe that implementing these measures as early as possible will meet customers' needs for low-carbon products throughout their lifecycle, and become their company of choice.

Example 2: Strengthening water infrastructure in emerging countries

Possible risks

With more fragile infrastructures and conditions that have not kept pace with rapid urban development, emerging countries are at risk of greater damage from the floods and other water damage that frequently occur due to the effects of climate change. When constructing product supply systems suited to customer production systems in emerging countries, we operate production plants directly or source raw materials from other companies in the surrounding area.

Conversion to opportunities

We are promoting our Cross-Wave rainwater storage system in emerging regions such as China, Southeast Asia, and India, in order to create a more resilient water infrastructure in those related areas. In fiscal 2019 we were able to build a positive relationship with the local water bureau in Indonesia to promote the system. As a result, the system was adopted for a large-scale residential land development, allowing SEKISUI to contribute to green infrastructure business in Indonesia.

Additionally, in order to rapidly build resilient water and sewer infrastructures, SEKISUI has partnered with a Vietnamese company to accelerate development of businesses that offer water and sewer infrastructure piping products, such as PVC ESLON PIPES and fittings.

[R&D Investments]
All R&D projects at SEKISUI are planned according to long-term strategies that take into account environmental and social issues such as climate change and aim to help solve related issues, and these projects are explored based on appropriate action plans.

Example 1: Perovskite solar cells

Possible risks

While demand for solar cell has increased, it has become difficult to address issues facing conventional cells, such as depletion of scarce resources, reduced demand for the energy used, and installation restrictions due to the effects on ecosystems or structural integrity of the host building. Demand for renewable energy is expected to increase even further, and related businesses will shrink if we are unable to respond to this demand.

Conversion to opportunities

We have begun research and development of perovskite solar cells, using SEKISUI film manufacturing technology. These solar cells are expected to be lighter and more efficient, allowing them to be installed more freely while generating more energy than conventional technologies.

Example 2: Bio refinery (BR) ethanol technology

Possible risks

The conversion of raw materials to non-fossil resources and the recycling of waste into materials are being promoted from the perspective of carbon cycle as a mitigation of climate change and from the perspective of resource cycle.
Failure to contribute to technological development and business that contributes to resource recycling across the supply chain can lead to market loss in the future.

Conversion to opportunities

A 1/10 scale pilot plant was constructed in Kuji City, Iwate Prefecture, to verify for full-scale implementation the BR ethanol technology that produces ethanol from waste, which can be expected as a carbon capture and storage (CCUS) technology that contributes to climate change mitigation. We are also collaborating with other companies to develop technologies to manufacture plastics from the ethanol that is produced.

<Effects of Climate Change on Financial Plans>
As mentioned previously, we analyse risks and opportunities through scenario analysis and since fiscal 2020 have been pursuing activities guided by medium-term management plans that reflect strategies to reduce risks and capture opportunities. This includes the “Products to Enhance Sustainability” system, an in-house system for creating and promoting products that contribute significantly to solving environmental issues, including climate change. We have established a long-term plan to double business by 2030. By expanding the FY2022 sales target for these products to 800 billion yen, we will further contribute to solving environmental issues such as climate change, and accelerate the conversion of risks into opportunities.

Our strategies to reduce risks and convert risks to opportunities in light of climate change have also been validated through methods such as carbon efficiency analyses and impact-weighted accounting. It has also become apparent that further strategies to transform current economic value into positive impacts will be important for future financial plans.

Summary :
We have created an environmental medium-term plan, “SEKISUI Environment Sustainability Plan: Accelerate II”, with milestones set by backcasting from the long-term goals of our environmental vision. The following two indices have been set as part of the environmental medium-term plan, to manage progress in relation to climate change.
・Net sales of “Products to Enhance Sustainability”
・Amount of greenhouse gas emissions (Scope 1, 2 and 3)
While we failed to reach our sales target of 640.3 billion yen (target: 700 billion yen) in fiscal 2020, we did achieve our target for greenhouse gas emissions, both for our own business activities and for the supply chain.

5–1. Indices for Evaluating Climate Change Risks and Opportunities

・Net Sales of Products to Enhance Sustainability
・Amount of Greenhouse Gas Emissions (Scope 1, 2 and 3)

As an initiative to solve environmental and social issues, various indicators and goals are included in the medium-term environmental plan "SEKISUI Environmental Sustainable Plan Accelerate II" (2020-2022), which is formulated based on the company-wide medium-term management plan. We are promoting measures to improve effectiveness by managing progress and setting targets. For the risks and opportunities identified by the impact analysis mentioned above, indicators are set and regularly monitored to evaluate the progress of risk reduction or opportunity acquisition.
In order to solve issues of climate change and reduces risks predicted under the 4°C scenario, we set and monitor indicators from two major perspectives.
One is an index for expanding contributing products, to ensure that we are solving climate change issues through our products and services.
This index uses the sales of “Products to Enhance Sustainability*2” which is a series of products certified by an in-house product certification system.
The other is an index to measure reduction of greenhouse gas emissions. We promote initiatives to reduce greenhouse gases emitted in our business activities. We have set indicators to evaluate risk reduction for greenhouse gas emissions from both our own business activities and from our supply chain (Scope 3). At SEKISUI, we include greenhouse gas emissions during transport of our products in Scope 1 and 2, as greenhouse gas emissions from our own business activities.
The level of achievement in meeting these indices is reflected in environmental performance evaluations, and also affects the bonuses of employees in managerial positions or higher as well as executive compensation.

5–2. Net Sales of Products to Enhance Sustainability

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

Medium-term target: Double the 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 have more than doubled (2020 baseline)

Of which, sales of products derived from non-fossil and recycled materials are 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 are 1.1 times (2020 baseline)

Of which, sales of products derived from non-fossil and recycled materials are 1.1 times (2020 BM)

In the medium-term management plan, we set targets for sales of products to enhance sustainability and sales of "premium category" and check the results to assess the progress of the strategy. Regarding the former we have also made public commitments, announcing our plans to reach 800 billion yen in sales by fiscal 2022 and to double business by 2030 by solving social issues.

We are also monitoring the amount of this registered product that contributes to the reduction of greenhouse gas emissions in products that contribute to climate change issues.

Since fiscal 2021, as part of our policy for addressing issues of resource recycling, we have also begun aiming for achievement of a circular society by 2050 and realization of a carbon-free society in order to address climate change, and have created a resource recycling strategy and roadmap based on backcasted milestones. Products that contribute to resource recycling are also low-carbon products, making them a core strategy for products that address climate change. We have set FY2022 sales targets of products contributing to resource recycling by 10% increase, from the FY2020 296 billion yen baseline, and double the sales volume by FY2030.

Regarding product innovation that contributes to resource recycling, we believe that switching plastic raw materials to non-fossil based or recycled sources is a priority area needing acceleration. We have set a target to increase net sales of such products by 10% in FY2022 and 30 times by 2030, from the 3 billion yen FY2020 baseline.

[Initiatives to Reduce Greenhouse Gas Emissions, and Achievements]

Net Sales of Products to Enhance Sustainability: 640.3 billion yen (net sales ratio: 60.6%)
(Target: 700 billion yen, not reached)

Of which, sales volume of Products to Enhance Sustainability that contribute to resource recycling: 296 billion yen (baseline).
Of this, sales volume of non-fossil-derived and recycled material-based products: 3 billion yen (baseline).

In fiscal 2020 there were 12 registrations of "products to enhance sustainability", for a total of 168 registration as of the end of March 2021. Net sales were 640.3 billion yen, which unfortunately fell short of our 700 billion yen target. One of the factors was the decline of aircraft materials, due to COVID-19. However, the net sales ratio reached 60.6%, which was 2.3 points higher than 58.3% from fiscal 2019. This shows that our fiscal 2020 business portfolio shift is on the right track to increase business by solving social issues.
In fiscal 2020, products that contribute to mitigating climate change were registered, such as heat-dissipating materials and thin foam tape, to support innovation of electronic products with 5G technology from an energy perspective and improve efficiency. Also, products that contribute to climate change adaptation, such as spray nozzles that allow for more efficient snow melting, were also registered.

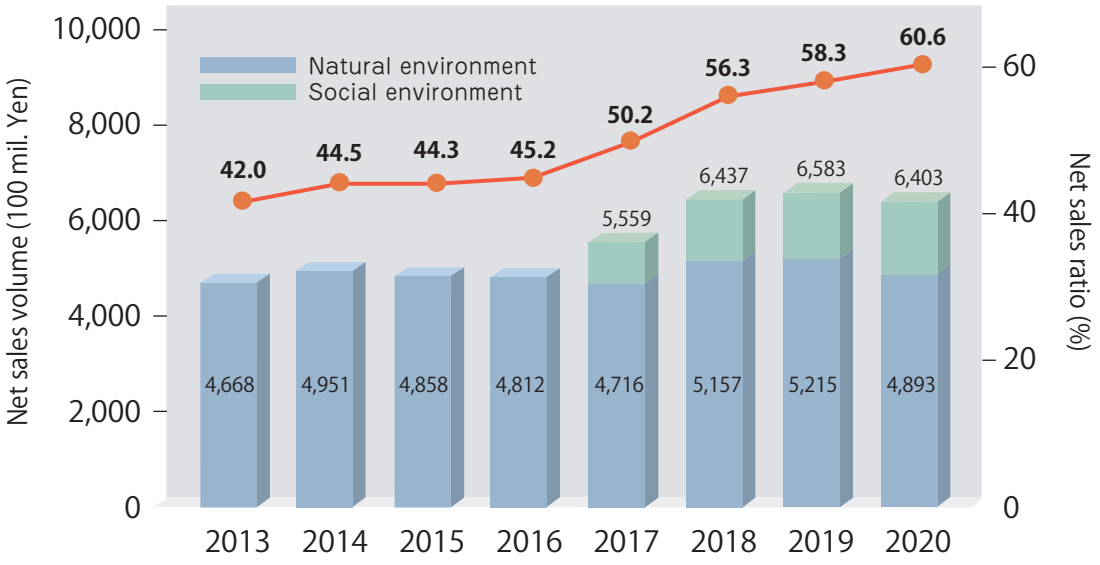


Fig. 12: Net Sales Volume and Ratio of Products to Enhance Sustainability

[Reference]

Reductions in greenhouse gas emissions from business operations and “products to enhance sustainability”: 6,375 kt-CO_2 (FY2020)

The contributions to reducing greenhouse gas emissions in the product life cycle compared to conventional or other comparable products are shown below. Contribution to reductions increased by 259 kt-CO_2/year, in comparison to 6,116 kt-CO_2/year in FY2019.
Contribution to reductions of climate change mitigation increased, due to increase in the ratio of housing with ZEH specifications and needs for automotive and transport materials.

Table 3: Disclosure to Contributions to Greenhouse Gas Emission Reductions*8 through products (by business fields, FY2020)

Fields	CO_2 reductions (kt-CO_2 /year)	Reason for contribution (representative examples)
Housing	1,028	Resolving energy issues (creation, conservation, storage) through solar panels, "SMART HEIM Navi" HEMS and storage battery-equipped housing
Infrastructure	587	Renewing deteriorated pipelines using the trenchless "SPR Method" reduces resource consumption and waste, while also minimizing the distance and amount time roads are closed during construction, thus avoiding traffic jams and improving fuel consumption of commuters
Automobiles and transportation	2,625	· Laminated glass interlayer film used for vehicle windshields · High-performance interlayer film with heat and sound insulation functions added to "S-LEC" improves fuel efficiency by reducing the weight of vehicles and improving the efficiency of car air conditioners.
Electronic materials	963	Intermediate materials that contribute to improved energy efficiency for LEDs, OLED, etc.
Other	1,171	Products that contribute to reduced CO_2 emissions over its lifecycle, through use of recycled materials and improved durability, etc.
Total	6,375	

*8 Contribution to Greenhouse Gas Emission Reductions through products:
Among Environment-Contributing Products, lifecycle greenhouse gas emissions were calculated using MiLCA LCA software (Japan Environmental Management Association for Industry) and the IDEA LCA database (National Institute of Advanced Industrial Science and Technology, Japan Environmental Management Association for Industry) for products corresponding to 75% of net sales.

S-LEC interlayer film for laminated glass, which is used on automobile windshields, contributes to reduce CO_2 produced during driving by reducing weight and by improving air conditioner efficiency through better heat and sound insulation.
Foam materials, which are intermediate materials that are rarely seen, have applications depending on their characteristics, and contribute to CO_2 reduction during use.
“Thermobreak”, insulation for pipe ducts, developed for the ASEAN market, improves energy efficiency through greater heat insulation. “High-performance foam tapes”, with excellent impact absorption, contribute to the performance for energy-efficient liquid crystal displays. Alveosoft, which is used in vehicles primarily in Europe, contributes to reducing weight for better fuel efficiency.
In the future, SEKISUI aims to increase its contributions by strengthening performance, adding new functions and penetrating into new markets where SEKISUI's exceptional products can continue to contribute to the reduction of CO_2 emissions.

5–3. Greenhouse Gas Emissions (Scope 1, 2, and 3)

[Greenhouse Gas Emission Reduction Targets]

Long-term target	: Reduce emissions from own business activities to effectively zero by 2050
Medium-term targets	: (1) Reduce greenhouse gas emissions from own business activities by 26% by 2030 compared to FY2013
	(2) Reduce Scope 3 emissions by 27% compared to FY2016

A schematic of our roadmap for reducing greenhouse gas emissions from our own business activities by fiscal 2050 is shown below.
Under the previous environmental medium-term plan (2017-2019), we promoted “innovate energy consumption” in production by upgrading aging production equipment. Under the current environmental medium-term plan (2020-2022), we have progressed to “innovating energy procurement”.
In FY2020, we formulated a long-term environmental vision, revising our target year from 2030 to 2050, and began related initiatives. Our aim is to reduce greenhouse gas emissions from business activities to be effectively zero by FY2050. Conversion to renewable energy was established as an important intermediate milestone for FY2030. We aim to reduce emissions by 26% by 2030 in comparison to FY2013, by converting purchased electric power to 100% renewable energy.
Additionally, we will strive to reduce greenhouse gas emissions to zero by 2050, through proactive steps such as creating energy and changing fuel sources through technological innovations.
We aim to reduce greenhouse gas emissions in the supply chain (Scope 3) by 27% by 2030, in comparison to FY2016. Our 2016 SCOPE3 emissions were the largest for "purchased products and services" (SCOPE3 category 1), accounting for about 50% of the total, and the next largest category was "use of sold products" (Scope 3, category 11), accounting for approximately 35% of emissions. In regards to "purchased goods and services" (Scope 3, category 1), SEKISUI began to re-evaluate procurement standards since 2018, aiming to set targets for greenhouse gas reductions for raw material suppliers and monitor progress toward those goals. We are also working with the CDP Supply Chain program to collect supplier emission levels, creating opportunities for dialogue and building cooperation that will lead to reduced emissions. In addition to calculating greenhouse gas emissions and disclosing data, we also actively exchange practical information about long-term goals and reduction measures with raw material suppliers to build relationships that promote mutual reduction.
Furthermore, we are aiming to reduce reductions by 20% by 2030, by switching to bio-based and recycled materials. Additionally, in regards to "use of sold products" (Scope 3, category 11), we aim to reduce emissions by 50% by 2030 through expanding sales of housing with ZEH specifications.

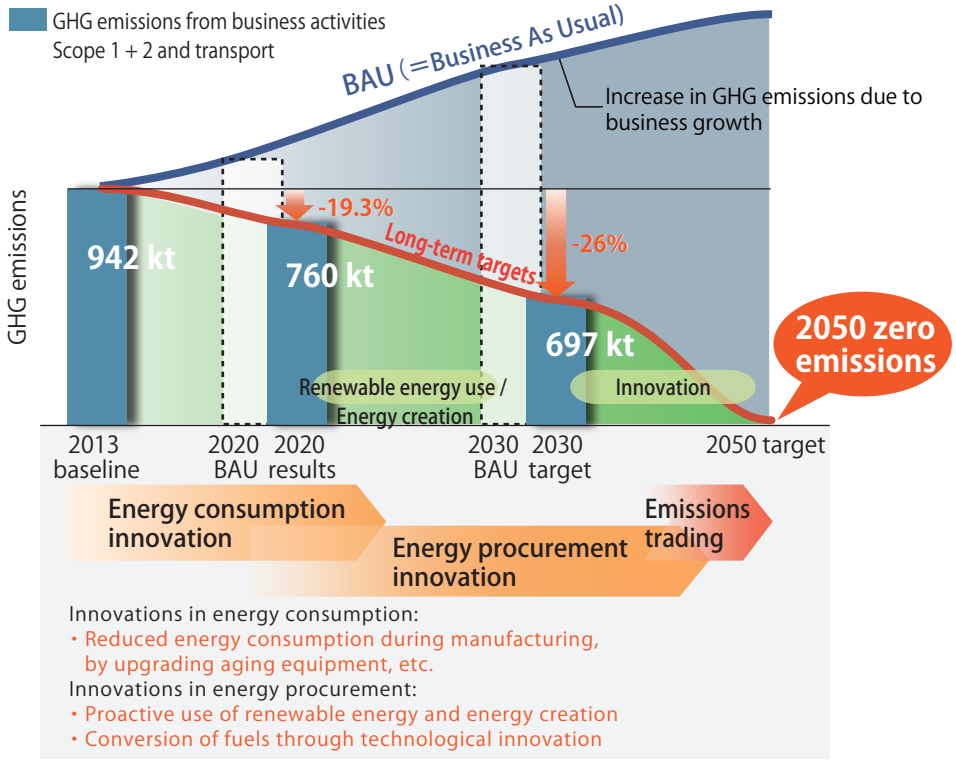


Fig. 13: Roadmap to reducing greenhouse gases

The following management indices and targets for greenhouse gas reduction have been established:

Table 4: Medium to long-term targets for greenhouse gas reduction

Item	Indices	Medium-term targets (2020-2022)	2030	2050	Notes
Reduction of GHG emissions	Ratio of purchased electric power and renewable energy	20%	100%	(Convert consumed to renewable energy)	Joined RE100
	Reduction of greenhouse gas emissions from business activities	Reduction of 9%or more (Compared to FY2013)	Reduction of 26% or more (Compared to FY2013)	Zero emissions	Acquisition of SBT certification (until 2030)
	Reduction of supply chain GHG emissions	–	Reduction of 27% or more (Compared to FY2016)	–	
Energy conservation	Energy use per production unit	Reduction of 3% or more (Compared to FY2019)	"Reduction of 10% or more (Compared to FY2019)	–	

*For details on indices and targets, see CSR Report pp. 143.

[Initiatives to Reduce Greenhouse Gas Emissions, and Results]

Renewable energy ratio of purchased electricity	: 7.2% (reached FY2020 target of 5%)
Reduction in greenhouse gas emissions from business activities	: 19.3% compared to FY2013 (reached FY2020 target of 7%)
Reduction in supply chain greenhouse gas emissions (Scope 3)	: 10.8% compared to FY2016 (reached FY2020 target of 7.7%)

Regarding reduction of greenhouse gas emissions from our own business activities, we are taking active steps to convert electrical power to renewable energy, such as installing solar at our own business sites for on-site consumption and purchasing renewable energy instead of conventional electricity. In fiscal 2020 we installed solar panel system at five additional sites, for a total of 10 sites in Japan and overseas, with a total capacity of 6.3 megawatts. Regarding externally purchased electricity, we have already converted to 100% renewable energy at eight business sites in Japan. In FY2020, our renewable energy ratio for purchased electricity, including in-house solar energy consumption was 7.2%.

Beginning in 2017, SEKISUI strategically designated 0.3% of consolidated net sales over a 3 year period to environmental investments for greenhouse gas reduction and mitigate climate change by converting aging equipment to energy-efficient equipment and processes, contributing to climate change adaptation by reducing water risks, and so forth.

For greenhouse gas reductions in particular, this included our Environment-Contributing Investments incentive program. This program is a form of internal carbon pricing, by which SEKISUI headquarters provides economic support to investing departments at 30,000 yen for each t-CO_2 reduced through these investments. Greenhouse gas reductions achieved through such investments continue to grow year after year once equipment installations are completed, contributing to reducing greenhouse gas emissions from SEKISUI production for many years to come. Fiscal 2020 greenhouse gas reductions from equipment upgrades as part of Environment-Contributing Investments was 32.6 kt-CO_2.

In addition to converting to purchase renewable electric power and the effects of Environment-Contributing Investments, production also decreased in fiscal 2020 due to COVID-19. As a result, the reduction in greenhouse gas emissions from business activities was 19.3%, reaching our FY2020 target of 7% reduction compared to FY2013 (Fig. 14).

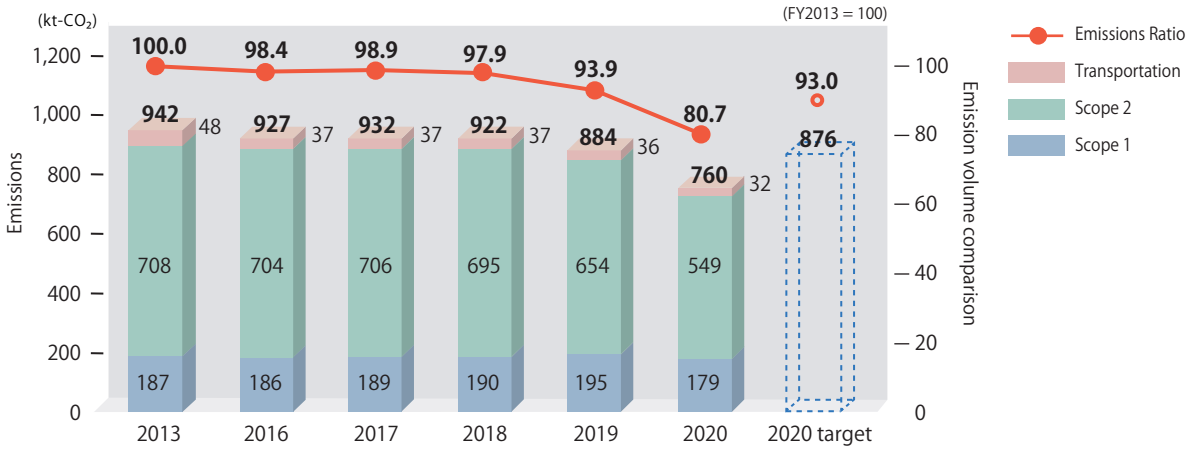


Fig. 14: Greenhouse gas emissions from business activities

Regarding reduction of supply chain greenhouse gas emissions (Scope 3), reductions for category 1 purchased goods and services have not progressed, but rather increased by 4.7%. However, emissions from use of products sold in category 11, the houses with ZEH specifications, was 85% in FY2020, which greatly exceeded our target of 65%. As a result, reductions were 54.0% in comparison to FY 2016, reaching our FY2030 target ahead of schedule. As a result from the above, the reduction in supply chain greenhouse gas emissions was 10.8%, reaching our FY2020 target of 7.7% in comparison to FY2016 (Fig. 15).

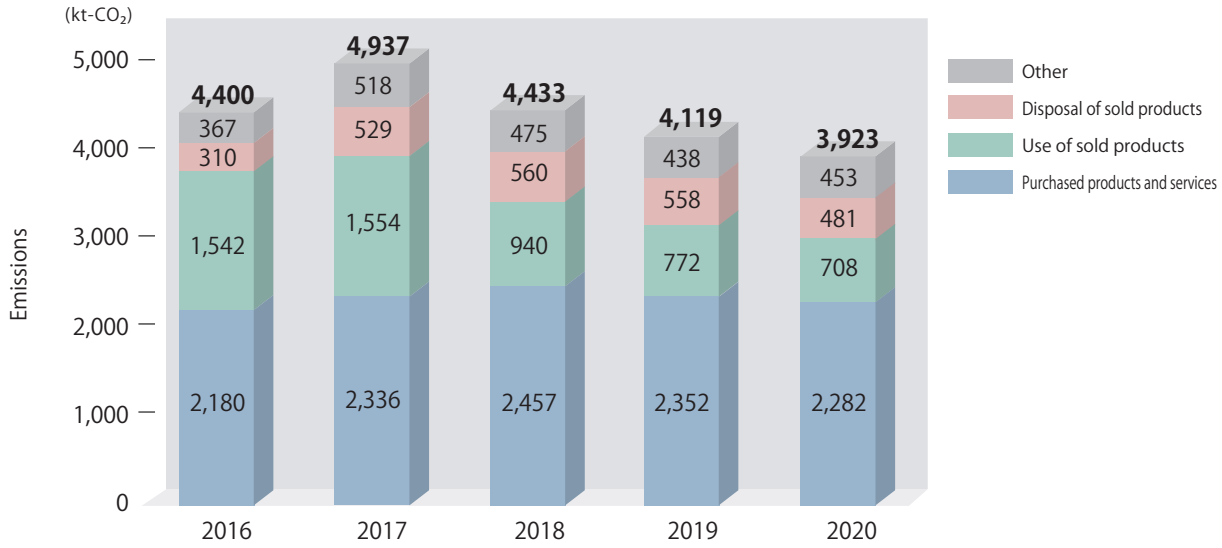


Fig. 15: Greenhouse gas emissions from supply chain

SEKISUI CHEMICAL Group has been disclosing information on its climate change initiatives in the TCFD reports since fiscal 2018. Recognizing the need for a long-term approach, we analyze risks to the company and risks that the company poses to the external environment, formulate strategies and implement measures to mitigate both of these risks and use them as opportunities and promote initiatives.

Currently, as the accuracy of scientific predictions increase, it is necessary to raise our goals in regards to climate change issues and strive to meet targets ahead of schedule. In addition to a variety of initiatives to curtail greenhouse gas emissions, we are also investigating innovations and measures for accelerating progress and are revising our milestones.

In recent years, an approach has emerged of evaluating long-term risks and formulating strategies related to issues such as resource recycling, water risks, and comprehensive environmental issues of natural/social capital and biodiversity. Additionally based on these evaluations, measures are being implemented and information is being disclosed (Taskforce on Nature-related Financial Disclosures (TNFD)).

Since fiscal 2012, as part of our long-term vision, SEKISUI CHEMICAL Group has recognized that our corporate activities affect natural and social capital. By solving a variety of social issues, including climate change, we believe we can help achieve an Earth where biodiversity is maintained, and we track and evaluate our progress in this regard in the "SEKISUI Environmental Sustainability Index".

In addition to climate change, in fiscal 2020 we formulated a long-term goal for 2050 and strategies for their achievement in regards to issues such as resource recycling and water risks, and began pursuing appropriate measures. In fiscal 2020, we created a resource recycling policy with a roadmap. In addition to pursuing related innovations, we have been developing policies to accelerate converting raw materials to non-fossil sources and to recycle non-fossil waste as materials. In other words, after recognizing that it will affect the natural and social capital used in resource recycling issues, and conversely, it will be affected, and after considering the risks and their impacts, we will start setting specific milestones and initiatives.

Moving forward, we aim to analyze risks and impacts related to a variety of environmental issues, create strategies to accelerate reduction of risks, and disclose information on the results of these initiatives. We recognize that promoting such information disclosure is important not only to show our sustainability, but also to gain partners in solving problems or to take a leading position in transforming society.
SEKISUI CHEMICAL Group will continue to promote sustainability initiatives that are integrated with its business activities, in order to achieve a sustainable society and the sustainable growth of the Group.