

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

### ■ Commitment to Action

#### SEKISUI's Stance on Climate Change

SEKISUI CHEMICAL Group understands that climate change is a serious environmental issue that must be addressed. As a sustainable company, contributing to society and the realization of a sustainable planet, SEKISUI is committed to addressing climate change through its businesses.

**[Environmental Vision]** In 2014, Sekisui released its “SEKISUI Environment Sustainability Vision 2030” (fig. 1), which serves as an environmental guidepost for SEKISUI's ESG management. Aware that SEKISUI's corporate activities rely on the Earth's natural resources, the vision aims by 2030 to achieve an "Earth with Maintained Biodiversity" by addressing planetary issues such as climate change, resource exhaustion and ecosystem conservation. To this end, SEKISUI has declared its commitment to help return natural capital through three activities: (1) Expand and create Environment-Contributing Products; (2) Reduce environmental impacts; and (3) Conserve the natural environment.

**[Management Indicators]** In 2013 SEKISUI began assessing its environmental contributions and initiatives by calculating, in economic terms (i.e. equivalent damages), the degree to which the impacts and contributions related to natural capital used in its corporate activities affect environmental issues. In order to also familiarize external stakeholders with the company's initiative, since 2014 SEKISUI has released the SEKISUI Environmental Sustainability Index, which indicates the company's return rate of natural capital--a ratio comparing SEKISUI's contributions, in economic terms, to its impact on natural capital. SEKISUI has declared its commitment to reaching a return rate of 100% or greater by 2030.

**[Medium-term Plan]** Recently, the importance of solving long-term challenges such as climate change and preparing for the early effects of the changes have grown increasingly pressing. In response, as of fiscal 2017, in order to strengthen awareness of its initiatives and increase its contributions to solving these issues, SEKISUI began using the “SEKISUI Environmental Sustainability Index” as a management KPI. As of fiscal 2018 the rate of return was 93%, surpassing the set target of 90% set under the medium-term “SEKISUI Environmental Sustainability Plan”: accomplishing (part of the company's 2017 three-year medium-term management plan) one year ahead of schedule. Developments that have supported this progress include reduction of greenhouse gases in the supply chain through expansion of ZEH (net-Zero Energy Houses) and increased sales of Environment-Contributing Products.

**[Awareness of the Effects of Climate Change]** Using the Sustainability Index, SEKISUI's impact on various environmental issues can be categorized as shown in fig. 2. Among environmental issues related to SEKISUI's corporate activities, climate change-related issues are particularly high (accounting for approximately 94%). This has reconfirmed the importance of addressing climate change for SEKISUI, and the company is pursuing initiatives to that end.



Fig. 1: SEKISUI Environment Sustainability Vision 2030:  
 Toward an Earth with Maintained Biodiversity

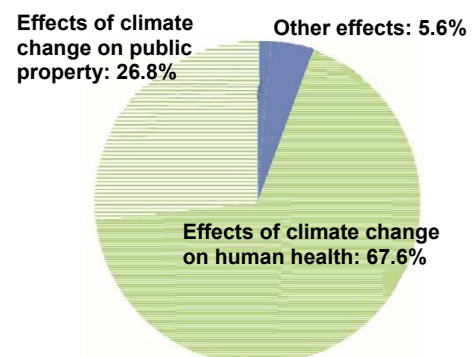


Fig. 2: Breakdown of effects on natural and social environment (fiscal 2018)

**[Effects of Climate Change on Business]** Furthermore, in recent years, as one of the apparent effects of climate change, the increased risk of water damage from natural disasters such as typhoons and severe rainfall has grown apparent. At SEKISUI, persons-in-charge of risk management in the business departments and subsidiaries regularly identify management risks from the external environment, including climate change, and take annual measures in regards to high-priority issues that demand improvement. Upper management then oversees risks collected by all departments, pursuing oversight and counter-measures at a company-wide level. Among these risks, water damage due to the effects of climate change is a frequent issue and has led to the inclusion of adaptation plans in BCPs at the smallest organizational levels (such as individual business sites).

### **SEKISUI Initiatives Related to Climate Change**

With the Paris Agreement identifying long-term international targets, the world is beginning to move towards low- or even decarbonized societies. SEKISUI is developing businesses, such as high-performance materials and infrastructural products made from plastics, and home-building and utilizing these products for urban planning which will contribute to climate change mitigation and adaptation.

Likewise, SEKISUI's disaster-resistant, highly reliable and durable prefabricated modular houses uniquely contribute to the adaptation of climate change. The ratio of production carried out at the plant versus on-site, for SEKISUI's prefabricated modular houses is very high, allowing for short on-site construction times. This minimizes risk from natural disasters due to climate change and allows construction to progress according to customer wishes and original plans. The houses can also be used to support evacuation and recovery after a disaster.

Additionally, SEKISUI is working to expand use of ZEH <sup>\*1</sup> specs in its housing business. As of 2017 ZEH specs have been standardized for all detached housing products, and in fiscal 2018 SEKISUI greatly exceeded its 55% target (excluding Hokkaido) for penetration of ZEH, reaching 73% instead. In order to achieve self-sufficient housing, SEKISUI has also been promoting inclusion of high-capacity solar cells and batteries in homes (SMART HEIM self-sufficient housing). Along with increased use of renewable energy, such housing provides an effective energy source in times of disaster, which likewise contributes to climate change mitigation and adaptation. SEKISUI businesses such as plastic piping, including highly durable and low-leakage PVC ESLON PIPES and EsloHyper polyethylene pipes, and construction materials including the Cross-Wave rainwater storage system, contribute to climate change adaptation by helping to reduce water-related risks and by providing society with resilient infrastructural foundations. Additionally, SEKISUI contributes to climate change mitigation in fields such as IoT, through heat releasing products and other such materials that ensure energy efficient operations. SEKISUI understands that, as the world moves towards a decarbonized society, it is through businesses and corporate activities such as these that the company can expand its role.

SEKISUI has realized for some time, that climate change is a priority among environmental issues, as well as one of the greatest external factors affecting management. SEKISUI releases details of its response to climate change, in accordance with TCFD guidelines.

### **SEKISUI's Climate Change-related Disclosure**

Based on their disclosure of climate change-related information, SEKISUI was selected as an A-list company by CDP in fiscal 2018 (fig. 3). Furthermore, in order to show the public that SEKISUI understands the importance of displaying corporate sustainability to disclose its analyses of business risks from climate change, and its strategic countermeasures, in January 2018 SEKISUI expressed support for the Task Force on Climate-Related Financial Disclosures (TCFD).



Fig. 3: CDP Climate Change A-List

*\*1 ZEH (net-Zero Energy House): When, through a combination of high insulation, energy-saving features, HEMS, solar generation systems, etc. a house produces more energy than it consumes, leaving its energy balance as zero or positive. The ZEH ratio is based on targets and results collected according to ZEH builder reporting methods, and includes Nearly ZEH.*

■ **Response to TCFD**

In January 2019 the SEKISUI CHEMICAL Group expressed agreement for the TCFD, which is a taskforce that analyzes and discloses the impact of climate change on corporate finances. The “SEKISUI CHEMICAL Group's CSR” policy calls for the company to increase corporate value and build trust with stakeholders, through pursuit of a healthy dialogue via “stakeholder engagement” and through proactive disclosure of financially, environmentally and socially relevant company information (fig. 4).

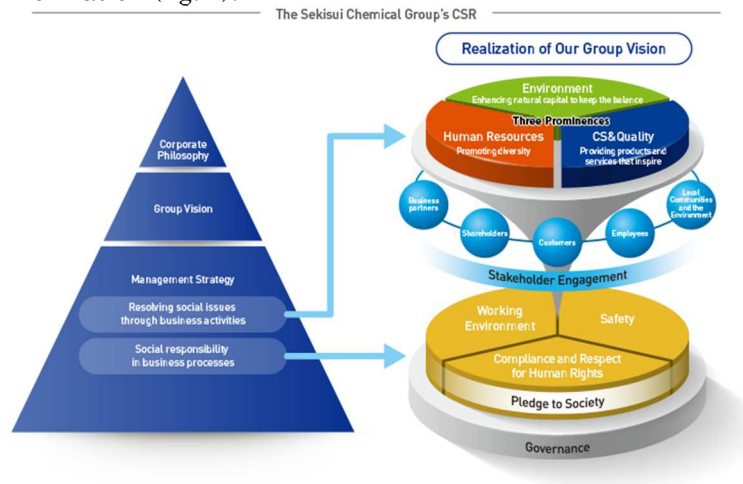


Fig. 4: SEKISUI CHEMICAL Group's CSR (conceptual chart)

Additionally, SEKISUI is working to build a management base that is sustainable from an ESG perspective, which is one of the basic strategies under SEKISUI CHEMICAL Group's “SHIFT 2019 -Fusion- Medium-term Management Plan”. In particular, a number of items for implementation for addressing climate change and other environmental issues have been established under the medium-term “SEKISUI Environmental Sustainability Plan: Accelerate” (FY2017-2019), with objectives established and progress tracked for each item.

## 1. Governance Systems Related to Climate Change

### 1-1. Oversight by the Board of Directors, and the Role of Directors in Evaluating and Managing Risks and Opportunities

In response to external 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.

Regarding SEKISUI's influence on external environmental issues such as climate change and its own social responsibility, until fiscal 2018, in its effort to alleviate the company's own impact and to contribute to solving these issues, Sekisui operated under the governance system displayed in fig. 5. Executive officers from each company participate in the environmental subcommittee (held twice per year), which addresses environmental issues and strategies. The subcommittee is chaired by the representative director in charge of the ESG Management Department. The subcommittee establishes targets related to climate change, keeping business strategies in mind; discusses strategies; and tracks progress. Resolutions made by this committee are reported to and deliberated upon by the CSR committee (held twice per year), which is attended by the presidents and other top officers of each company, as well as employee representatives to discuss management sustainability. Matters of high importance are then reported to and deliberated upon by the Board of Directors.



Fig. 5: Governance system for climate change-related issues

Examples of climate change-related decisions that have been discussed and decided by the management

- Quotas for Environment-Contributing Investments: end of fiscal 2016, management meeting to determine the budget (budget meeting)
- Supply chain initiatives and SBT certification and application: August 2017 policy meeting; September environmental subcommittee
- Expressing support for TCFD: November 2018 management meeting (corporate meeting)

## 2. Risk Management

### 2-1. Process for Evaluating and Managing Climate Change-related Risks and Opportunities

When necessary, the Board of Directors discusses external risks to management and sustainability, and decides upon an appropriate response. Aware that climate change is a major external risk, SEKISUI assesses and works to mitigate the effects of climate change in accordance with the medium-term environmental plan approved by the Board. Furthermore, SEKISUI explores ways to adapt to company risks caused by climate change and increase business sustainability.

#### Process for Evaluating and Managing Management Risks, Including Climate Change

Recently, the need to accelerate climate change mitigation and adaptation measures, and evaluate risks from a more long-term perspective is increasing. As a result, in 2018, in order to better accelerate risk evaluation and climate change measures, SEKISUI carried out risk assessments based on the 2°C or less and the 4°C scenarios.



## Process for Evaluating and Managing Opportunities Presented by Climate Change

As with similar opportunities presented by social issues and other environmental issues, SEKISUI looks for strategies by which it can transform the 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 technology/Environment-Contributing Products certification committee <sup>\*1</sup> and the external advisory board <sup>\*2</sup> in these efforts. Executive officers and the persons-in-charge at organizations responsible for business planning and technology development at each Divisional Company provide feedback on these discussions and explore the necessary business strategies.

*\*1 Certification committee: A committee responsible for certifying products that contribute to a high degree of solving environmental and social issues, according to internal company standards. Committee is composed of executive officers and other persons in position of responsibility, as required by the business or technology in question.*

*\*2 External advisory board: A board comprising five external experts, as well as the aforementioned certification committee members and with the representative director in charge of the ESG Management Department serving as chair; which meets to exchange opinions on registration of Environment-Contributing Products.*

### 2-2. Merging of Climate Change Risks and Comprehensive Organizational Risk Management

In regards to management risks from the external environment, including climate change, SEKISUI has constructed an integrated risk management system that combines risk management (designed to prevent the full range of management risks) with crisis management (for addressing risks when they do occur) (fig. 6). This system, overseen by the director in charge of risk management, apprehends analyses of risks identified by persons-in-charge at business companies, departments and production sites, as well as priority issues. The system also identifies major company-wide risks, exploring appropriate responses and sharing information with the Board of Directors and with the subcommittees led by officers relevant to the risks in question. Matters related to environmental risks, including climate change, are reported to and deliberated upon by the environmental subcommittee, led by the representative director in charge of the ESG management and promotion department. Progress on responses to these risks is also tracked.

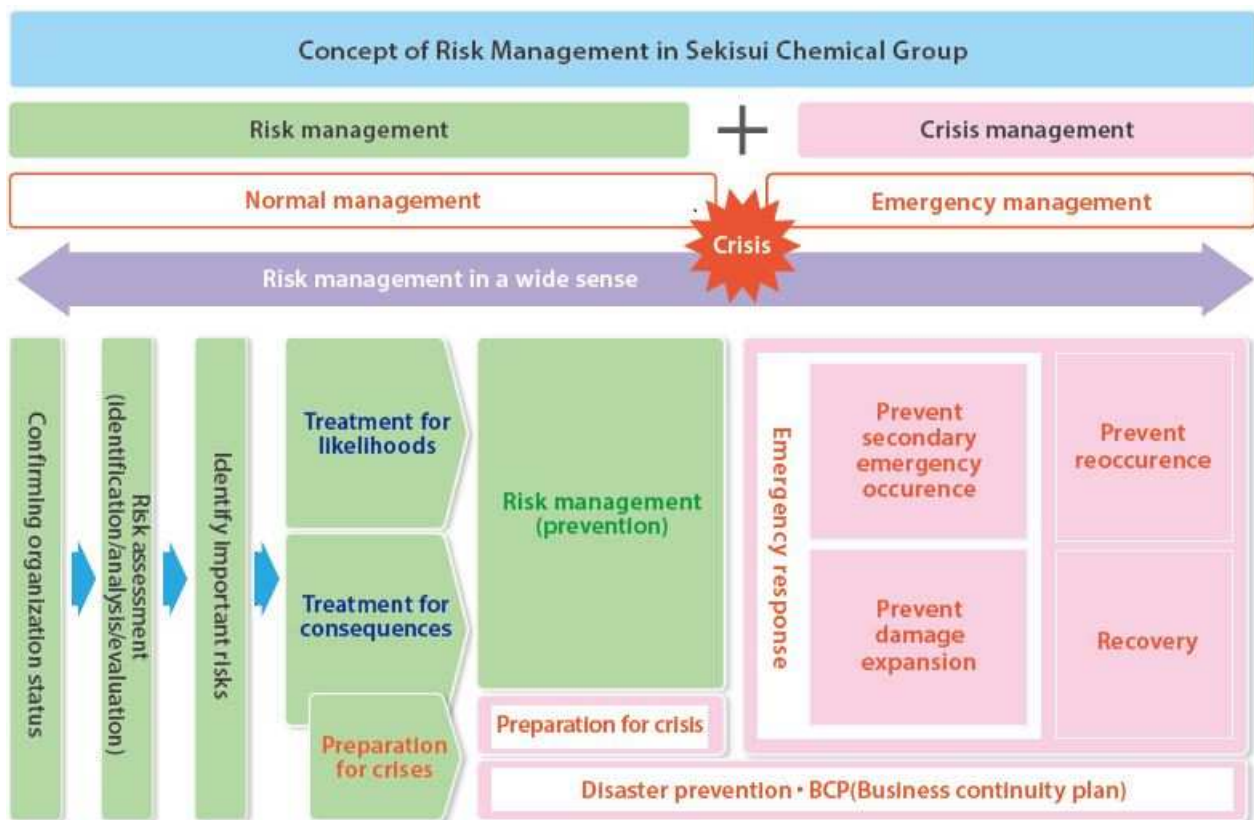


Fig. 6: Risk management system

### 3. Strategy

#### 3-1. Awareness of Risks and Opportunities

##### Analysis of the Impacts of Climate Change Risks

A variety of international institutions have formulated multiple climate change scenarios predicting what may occur over the next 100 years. When identifying risks from climate change to SEKISUI and its businesses and exploring 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).

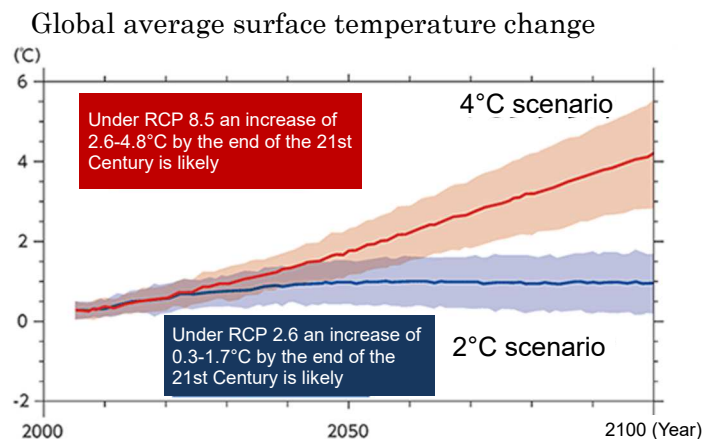


Fig. 7: IPCC climate change scenarios

According to the IPCC Fifth Assessment Report, the scenario with the lowest predicted amount of warming (RCP 2.6) will see a rise of around 2°C. The scenario with the highest predicted amount of warming (RCP 8.5) will see a rise of around 4°C. When carrying out analyses of climate change impacts by the different business fields, SEKISUI scenario of 2°C or less was used for IPCC RCP 2.6, and the SEKISUI scenario of over 4°C was used for RCP 8.5 (fig. 7). Strategies to prepare for long-term risks were explored based on these analyses. As part of this process, opinions were exchanged between related departments, external experts, internal and external think tanks, and such.

First, transition and physical risks were identified for five fields (housing, infrastructure, automobiles and transportation, medical, energy), based on 2°C and 4°C scenarios, with reference to the size of net sales and operating income, profitability, growth and so forth.

Possible risks and impacts in each business field were analysed, with the consolidated results shown in table 1, below. Negative effects with a major financial impact on SEKISUI are considered as risks, while positive effects are considered as opportunities.

**Table 1: Results of Climate Change Risks Impact Analyzes**

Type	Climate change Risk item	Rating	Business risk	Business opportunity	SEKISUI response
Transition	Policy regulations	Carbon tax hike	Large <Medium- to long-term> • Increase in energy procurement costs • Decrease in sales due to shift to product prices	<Medium- to long-term> • Acquire business opportunities by differentiating through early response • Stabilization of energy costs by introducing renewable energy	• Increase internal awareness of in-house carbon pricing management through "Environment-Contributing Investments Promotion Measures" • Increase effectiveness with commitments to society through SBT certification
		Energy saving/ low carbon regulations	Large >Short-term> • Increase in capital investment to strengthen energy saving 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 <sub>2</sub> -regulation compliant products	• Establish Environment-Contributing Investments quota (12 billion yen/3 years) • Develop new energy creation technologies (Ex.: perovskite PV) • Appropriate revision of green procurement standards • Standardization of ZEH housing
		Policy	Large <Short-term> • Increase in renewable energy procurement and waste treatment costs <Medium- to long-term> • Share reduction from loss of differentiation due to mandating of low-carbon products such as ZEH	<Short-term> • Increased needs for CO <sub>2</sub> reducing technologies during waste incineration <Medium- long-term> • Increase in sales of newly built homes due to expansion of ZEH market due to mandating of ZEH	• Development of technologies to create ethanol from garbage (Ex.: BR) • Utilization of purchased electricity after FIT (Ex.: Smart Heim Denki) • Expansion of Environment-Contributing Products (Net sales ratio: 56%→100% (2030))
		Litigation	Medium <Medium- to Long-term> • Lawsuits against companies using fossil fuels	<Medium-term> • Increase in business opportunities due to consumer trust earned from commitments to society	• Disclose long-term vision and long-term GHG reduction targets • Improve standing in various external rating systems
	Technology	Transition to low carbon products	Medium <Short-term> • Increase in re-authorization 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 contributes to low carbon emissions	• Use LCA evaluations in planning, development and marketing • Use LCA evaluations in marketing • Consider product development using bio-materials
		Markets	Change in consumer behaviour	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
	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 self-sufficient detached housing • Development of resource recycling technologies (Ex.: BR)
	Reputation	Changes in consumer preferences	Medium <Long-term> • Decrease in sales due to increase preference for sharing over owning	<Long-term> • Creation of new businesses to meet the preferences	• Begin services utilizing housing big data (Ex.: Smart Heim Denki)
		Industry criticism	Large <Medium- to long-term> • Decrease in investor evaluation for non-low carbon companies	<Short- to medium-term> • Secure stable funding by demonstrating compatibility with resource recycling	• Utilization of purchased electricity after FIT
	Physical	Acute	Frequent typhoons	Large <Short-term> • Damage such as increase in plant stoppages and decrease in sales • Increase in flooding/flood control costs	<Short-term> • Increase in needs for promoting resilient infrastructure • Increase in sales of products for high water-related risk areas
Heavy rain/ droughts			Large • Decrease in sales due to supply chain disruption <Medium- to Long-term> • Increase in insurance costs	• Increase in needs for equipment/facilities for disaster preparedness	• Expand infrastructural business in developing nations • Develop disaster response products (Ex.: drinking water storage systems)
Chronic		Changes in rainfall patterns	Medium <Short-term> • Increase in costs for supply chain restructuring	<Short-term> • Increase in sales of heat insulating/heat shielding products	• Encourage changes on the part of raw material suppliers in accordance to the procurement standards • Globally disperse production bases
	Sea level rise	Medium <Medium- to long-term> • Increase in heat stroke/other warming-related illnesses	<Medium- to long-term> • Increase in needs for pharmaceutical products/diagnostic drugs to contribute to treatments	• Strengthen backup manufacturing support in accordance with increase in illnesses	
	Rise in average temperatures	Medium • Increase in cooling costs			

Financial impacts in the table are graded as low, medium or high according to the effect on related financial indicators, and details of risks and opportunities are listed as short-term (less than 3 years), medium-term (3-6 years) or long-term (6 years or more) according to the amount of time expected to transpire before impacts become apparent.

### 3-2. Explanation of Effect of Climate Change-related Risks and Opportunities on Organization's Businesses, Strategies and Financial Plans

#### Effect of Climate Change on Businesses and Strategies

The effects of climate change on businesses and strategies are itemized below.

#### [Products and Services]

In regions where natural disasters grow more frequent due to climate change, SEKISUI is able to offer products that will alleviate water damage risks, and contribute to building resilient infrastructure. SEKISUI can provide highly durable water/sewage pipes and fittings that resist damage and cracked seams, water retention materials, and other similar products. The market for CROSS-WAVE water retention systems, capable of temporarily storing rainwater underground during times of heavy rain, is expanding in regions such as China, Southeast Asia and India, where natural disasters are on the rise.

To solve the infrastructural issues faced due to rapid urban growth in emerging nations and rapidly build resilient water and sewage infrastructures, SEKISUI has partnered with a Vietnamese company to develop businesses offering water service infrastructure piping such as PVC ESLON PIPES and fittings.

Additionally, climate change demands use of new renewable energies, and in order to address climate change SEKISUI is also starting new businesses related to this use. In April 2019, in order to promote effective use of renewable energy, SEKISUI announced SMARTHEIM DENKI, a new electricity trading service that will purchase surplus energy from customers living in solar-equipped SEKISUI housing, for sale to other customers or for use during SEKISUI CHEMICAL Group business activities. Development of services such as these will contribute to building a more resilient society, in terms of energy.

### **[Supply Chains and/or Value Chains]**

As regulations designed to mitigate the effects of climate change grow stronger, it will be necessary to also reconsider manufacturing processes and energy sources used by suppliers. If supplier measures are delayed, large increases in manufacturing costs may occur simultaneously, leading to fluctuations in the costs of raw materials purchased by SEKISUI. Beginning in fiscal 2018, to stabilize raw material supply and mitigate climate change on a global level, SEKISUI began using procurement guidelines to encourage raw material suppliers to establish GHG reduction targets reduce emissions.

Furthermore, to mitigate the risk of raw materials plants becoming inoperable due to natural disasters caused by climate change, SEKISUI has established procurement networks that utilize multiple raw material suppliers. SEKISUI is also looking into moving production bases from regions where natural disasters and other physical risks are predicted to regions where risks are lower.

### **[Mitigation and Adaptation Efforts]**

Mitigation: Policy introductions such as mitigation initiatives, industry guidelines, and carbon and energy taxes are accelerating quickly. Failure to grasp these trends and pursue swift measures could contribute to reputation risks, as well as financial risks due to increased operating costs. In order to transform risks into opportunities, SEKISUI has publicly expressed its commitment to achieving long-term goals by acquiring SBT certification to indicate its commitment to reduce greenhouse gases, and is pursuing effective reduction measures. Specifically, SEKISUI has designated 12 billion yen over three years, equivalent to over 0.3% of sales, to Environment-Contributing Investments. While exploring effective reduction measures, SEKISUI has deployed a CO<sub>2</sub> investment incentive policy utilizing internal carbon pricing frameworks, and is proactively pursuing GHG-reducing upgrades to production facilities.

Adaptation: Preparing for increased disasters and changes in lifestyles caused by climate change will be essential. In addition to helping to build resilient infrastructures capable of withstanding disaster, SEKISUI also focuses on promoting and developing housing products that support lifestyles during and after disasters, such as storage batteries to provide energy during blackouts.

### **[R&D Investment]**

SEKISUI carries out planning and R&D that accounts for climate change in all development projects, and plans products designed to solve long-term problems caused by climate change. One example of such research and development is the energy producing perovskite solar cells, which are lightweight, highly efficient, and more compact than conventional solar cells. SEKISUI is also investing toward early demonstration tests and scaling of biomass refinery technology for creating ethanol from garbage, and is exploring popularization of the technology. This is a carbon capture utilization (CCU) technology that can contribute to climate change mitigation.

### **[Operations]**

Plant stoppages due to large-scale power outages caused by frequent natural disasters brought on by climate change or interruptions to material and product supply chains, could have a massive impact on business operations. SEKISUI has prepared for disaster by establishing cogeneration-based in-house power generation systems at some of the main plants. Also, initiatives such as investigating multiple procurement sources to diversify raw material supply network are considered to reduce risks.



### Effects of Climate Change on Financial Plans

In order to mitigate climate change, it is necessary to switch to renewable energy for business activities. There are concerns, however, that under the current circumstances energy costs on the renewable energy supply market may increase. However, as the world continues to transition towards renewable energy, the cost of energy should in fact decrease.

Also, sales can be expected to increase due to increased needs for construction of resilient water infrastructure in regions suffering frequent water damage due to the effects of climate change, with installation of resilient water and sewage pipes, fittings, and other products in emerging nations, and rehabilitation of deteriorated pipes (SPR Method) in advanced nations.

The global spread of regulations designed to achieve a low or decarbonized society may also lead to a decrease in sales or profits, due to costs associated with GHG emissions or lost business opportunities. SEKISUI has begun exploring lifecycle-inclusive ways to prevent this, such as switching to renewable energy for production, or adopting low-carbon raw materials.

### 3-3. Analyses of Scenarios (Risks and Opportunities)

Below is an explanation of SEKISUI's strategy, based on analyses of the aforementioned 2°C and 4°C climate change scenarios.

#### Examples of Scenario Analyses

During analysis, multiple driving forces (including climate change) that can be expected to impact the future of each business field 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.

Results are shown below, with the driving forces that widely affect the range of SEKISUI business fields separated along two axes. Social systems such as town building and energy sources serve as one common axis, stretching from **centralized** (urban concentration, central management) to **dispersed** (population decentralization, local consumption). The 2°C and 4°C climate change scenarios serve as the other axis, resulting in four future scenarios for SEKISUI's business in the four separate quadrants (fig. 8).

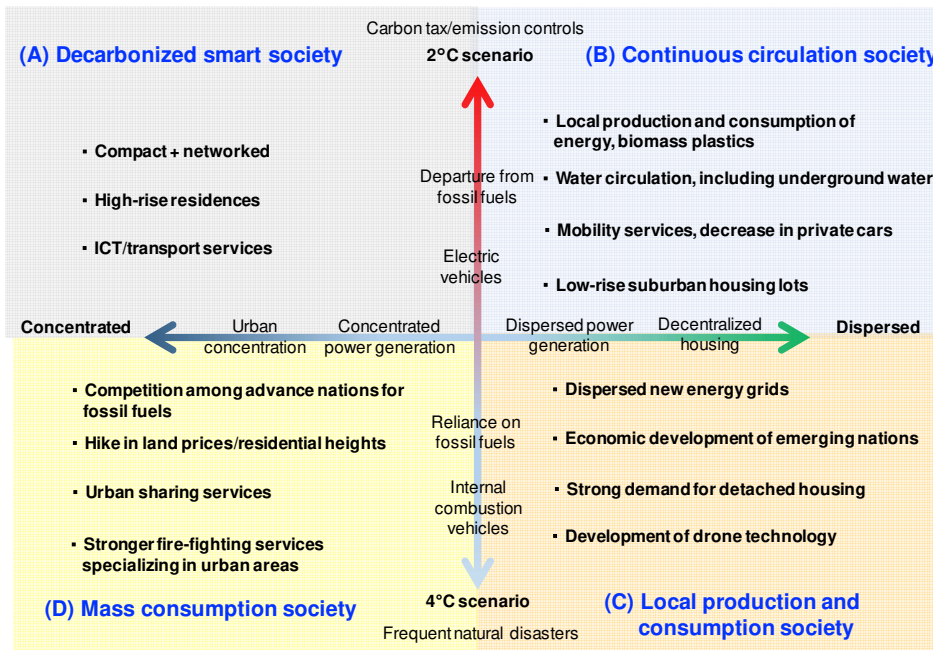


Fig. 8: Scenario axes and scenario keywords

The illustration below displays a society based on the 4 scenarios (fig. 9). Risk and opportunities for SEKISUI under the four societies envisioned here were analyzed, with the following chart describing SEKISUI's possible strategies for adapting to each of the societies (chart 2).

Scenarios involving various policies to control climate change

(A) Decarbonized smart society

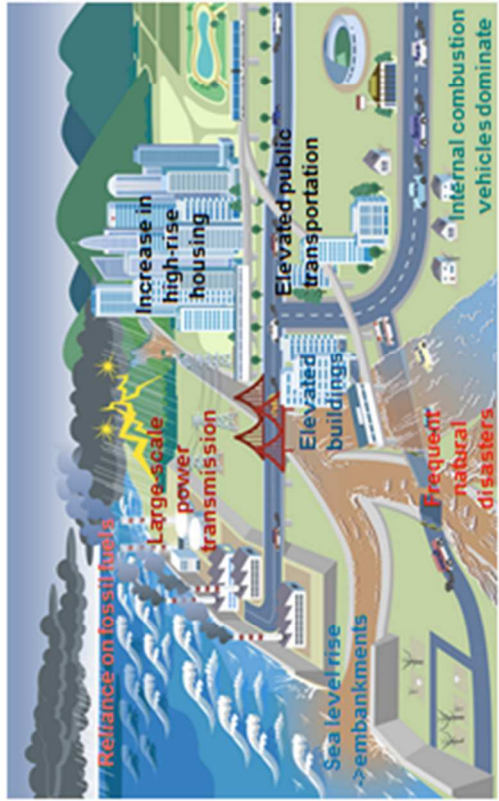


(B) Continuous circulation society

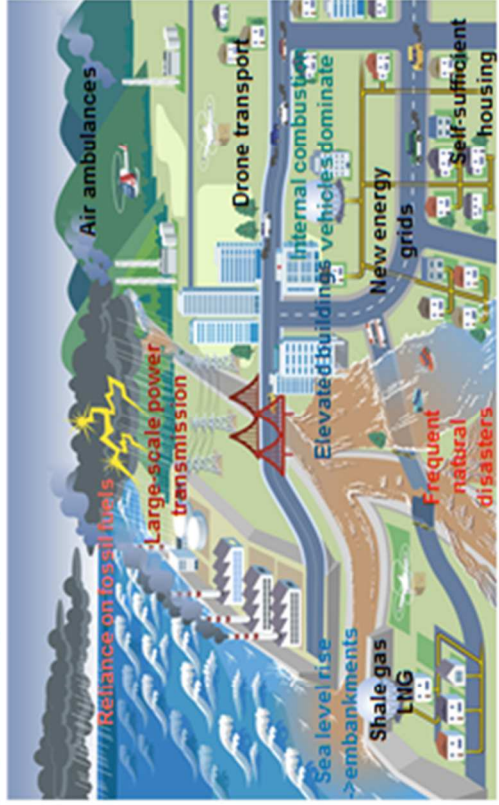


Scenarios involving increased urban concentration

(D) Mass consumption society



(C) Local production and consumption society



Scenarios involving regional dispersion

Fig. 9: Illustration of four society scenarios

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



Table 2: Response to Expected Scenarios

	Scenario (A)	Scenario (B)
	Decarbonized smart society scenario (2°C X concentrated)	Continuous circulation society scenario (2°C X dispersed)
Opportunities	<ul style="list-style-type: none"> <li>Increased demand for smart infrastructure, remote control systems, etc.</li> <li>→sophisticated practical infrastructure technologies, expanded services</li> <li>Increased demand for power generation/storage products</li> <li>→Higher performance electric/energy products</li> </ul>	<ul style="list-style-type: none"> <li>Dispersed power generation →Increased demand for power generation, storage and related technologies</li> <li>Expanded cyclical use of resources such as power, water, carbon, etc.</li> <li>→Increased demand for outfitting recycling infrastructure</li> <li>Increased demand for ZEH housing</li> </ul>
Risks	<ul style="list-style-type: none"> <li>Decreased car sales due to transition to mobility services</li> <li>→Decreased sales of housing and mobility related products</li> <li>Transition to renewable energy</li> <li>→Increase in energy procurement costs</li> <li>Decreased demand for low-rise housing</li> <li>→Decreased sales of housing related products</li> </ul>	<p style="text-align: center;">←</p> <p style="text-align: center;">←</p> <ul style="list-style-type: none"> <li>Decreased reputation among customers and investors due to failure to decarbonize</li> <li>→Decreased ability to procure funds</li> </ul>
SEKISUI response	<p>[Production activities] Begin transitioning to renewable energy (introduction of megasolar (US), SMART HEIM Denki)</p> <p>[Housing business] Standardize ZEH</p> <p>[Energy] Begin storage battery business</p> <p>[IT] Develop materials to promote ICT level-up (heat dissipating materials, materials for LED and organic EL)</p>	<p style="text-align: center;">←</p> <p style="text-align: center;">←</p> <p>[Energy] Promote the spread of energy self-sufficient housing (PV, storage batteries) Also contribute to local energy production and consumption through TEMS</p> <p>[Vehicles] Provide high performance, new function materials that support the functionalization of vehicles and aircrafts. (S-LEC wedge-shaped HUD interlayers, KYDEX sheets, CFTRP)</p> <ul style="list-style-type: none"> <li>Establish technologies for CCU systems (BR)</li> </ul>
	Scenario (D)	Scenario (C)
	Mass consumption society scenario (4°C X concentrated scenario)	Local production and consumption society scenario (4°C X dispersed scenario)
Opportunities	<ul style="list-style-type: none"> <li>Promoting resilient infrastructure and automated driving infrastructures</li> <li>→Increased sales of highly durable infrastructure materials and construction services</li> <li>Increased needs for energy-related products for large-scale generation</li> <li>→Increased sales of products related to stabilizing systems and improving generation efficiency</li> </ul>	<p style="text-align: center;">←</p> <ul style="list-style-type: none"> <li>Creation of new energy grid construction market</li> <li>→Need for control system and energy infrastructure technologies</li> </ul>
Risks	<ul style="list-style-type: none"> <li>Increased raw material and energy costs due to efforts to secure disaster-resilient supply chains, distribution and energy</li> <li>Increased costs to transfer plants in regions weak against natural disaster</li> <li>Human cost increases due to increased warming-related illnesses</li> <li>[Housing] Decreased demand for low-rise housing</li> <li>→Decreased sales of housing related products</li> </ul>	<p style="text-align: center;">←</p> <p style="text-align: center;">←</p> <p style="text-align: center;">←</p> <ul style="list-style-type: none"> <li>Massive damages due to area disruptions to infrastructure</li> </ul>
SEKISUI response	<ul style="list-style-type: none"> <li>Consider the area and organizational risks at the level of persons-in-charge at business companies and sites, formulate BCPs, explore risk mitigation strategies</li> <li>[Water infrastructure] Expand businesses contributing to more resilient water infrastructure (Rejuvenation: SPR method, New construction:Collaboration with Vietnamese companies)</li> <li>[Transportation infrastructure] Improve durability of transportation infrastructure (Utsuku Sheet, InfraGuard)</li> <li>Strengthen contract manufacturing system for pharmaceutical products</li> <li>Contribute to more stable power supplies by moving grids underground (CC-Box)</li> </ul>	<p style="text-align: center;">←</p> <p style="text-align: center;">←</p> <p style="text-align: center;">←</p> <p style="text-align: center;">←</p> <ul style="list-style-type: none"> <li>Explore HEMS and other TEMS technology for building smart grids (Smart Heim Denki)</li> <li>Develop urban planning businesses (expand services)</li> </ul>

### Summary of Analyses of Scenarios

SEKISUI CHEMICAL Group housing and infrastructural products are all designed to be highly durable and resilient against disaster. In the aforementioned 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 where greater mitigation is pursued, many business opportunities will also be available, such as solar-equipped housing which helps drive reduced GHG emissions and adoption of renewable energy, new energy generation technologies, and development of technologies to support energy efficiency for aircrafts and automobiles.

In addition to climate change, many variable factors, such as technological development in various industries, remain uncertain. However, whether the world progresses toward a more concentrated or dispersed society, this analysis has confirmed the need for SEKISUI to prepare to transform risks into opportunities, be the development and fortification of products designed to address risks that will likely occur with centralization, or technologies that will be necessary for dispersion.

#### **4. Indices and Targets**

##### **4-1. Indices for Evaluating Climate Change Risks and Opportunities**

As part of the medium-term “SEKISUI Environmental Sustainability Plan: Accelerate” (FY2017-2019) which was formulated under a company-wide medium-term management plan, SEKISUI has established a variety of indices and goals to address environmental and social issues. SEKISUI also tracks progress, and pursues measures to increase effectiveness.

This includes pursuit of initiatives to address climate change focused on the three areas below, and monitoring and managing of progress toward mitigating climate change by reducing greenhouse gas emissions.

##### **4-2. Reducing GHGs from Product Production Processes through Environment-Contributing Investments**

**[As of Fiscal 2018, Environment-Contributing Investments have Reduced Emissions by 30,600 t-CO<sub>2</sub> (Fiscal 2018 Results: 22,000 t-CO<sub>2</sub>)]**

Since 2017, SEKISUI has strategically designated 0.3% of company-wide net sales over a 3 years period for environmental investments designed to reduce GHGs and mitigate climate change by transitioning to energy-efficient processes, contribute to climate change adaptation by reducing water risks, and so forth.

Particularly regarding GHG reductions, in order to begin reaping benefits from effective investments as early as possible, SEKISUI has introduced frameworks such as “CO<sub>2</sub> Investment Incentive Policy” and the “Global Warming Contribution Award” (President's Prize). The investment incentive policy is an example of internal carbon pricing, with economic support provided from headquarters for investments proportionate to their projected GHG reductions. The Contribution Award is awarded to production sites that achieve high reductions in CO<sub>2</sub> proportionate to the size of the business site. These policies have also created a chain effect, with CO<sub>2</sub> reductions from investments increasing year by year and emissions from SEKISUI manufacturing steadily decreasing.

As of March 2019, cumulative GHG reductions from the Environment-Contributing Investments have reached 30,600 t-CO<sub>2</sub>, with 22,000 t-CO<sub>2</sub> achieved in fiscal 2018 alone (fig. 10).

SEKISUI's target for GHG reductions from business activities is 26% by 2030, compared to fiscal 2013. The company is pursuing a variety of policies to reach the 2019 6% milestone set under their medium-term management plan. In fiscal 2018, in addition to contributing investments, SEKISUI reduced GHG emissions through energy-saving activities and electricity procurement, consolidation of production networks, and other similar efforts. However, this was not enough to counteract the effects of M&A's and production increases, and they were unable to reach their yearly target of 4% reduction (compared to fiscal 2013). Moving forward, SEKISUI will further accelerate Environment-Contributing Investments and use of renewable energy, striving to find new ways to meet GHG reduction targets (fig. 11).



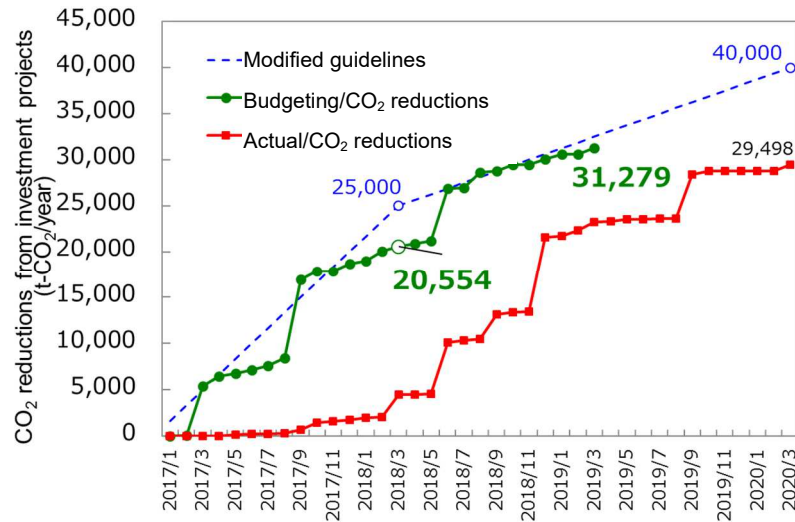


Fig. 10: Status of Environment-Contributing Investments CO2 investment promotion policy

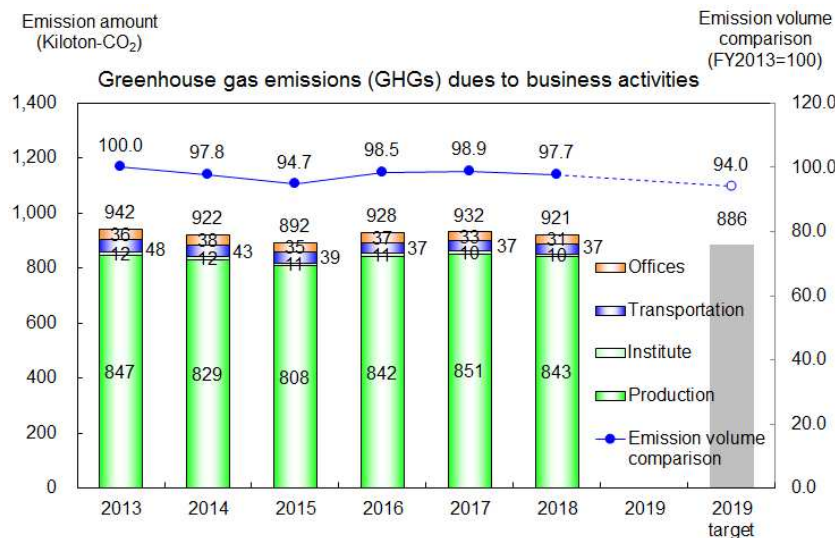


Fig. 11: GHG emissions generated by business activities

#### 4-3. Long-term and Supply Chain Initiatives

**[Declaring by Fiscal 2030: Scope 1 + 2: 26% Reduction over Fiscal 2013; Scope 3: 27% Reduction over Fiscal 2016]**

In June 2018, SEKISUI received SBT certification for their internal company targets and supply-chain-inclusive Scope 3 targets for GHG reductions. This certification signifies that SEKISUI's targets are scientifically based and show their commitment as a company, to voluntarily contributing to the fight against climate change.

In 2018 SEKISUI began to re-evaluate procurement standards, aiming to set targets for GHG reductions for raw material suppliers and monitor progress toward those goals. They worked with the CDP Supply Chain Program to grasp supplier emission levels, creating opportunities for dialogue and building cooperation that will lead to reduced emissions. For raw material suppliers, SEKISUI not only pursues calculation and disclosure of GHG emissions, but also shares practical information such as long-term goals and reduction policies, working together with suppliers to reduce emissions on both sides.

#### 4-4. Contributions to Reductions through Products and Businesses

**[As of Fiscal 2018, SEKISUI has Contributed to 5,413 t-CO2/year in GHG Reductions through Its Products and Businesses]**

SEKISUI products reduce GHGs, in comparison to previous and other comparable products, across the product lifecycle as shown below. Contributed reductions increased by 436,000 t-CO2/yr over fiscal 2017, from 4.977 million t-CO2/year.

**Table 3: Disclosure of Contributions to Greenhouse Gas Emission Reductions (by business, fiscal 2018)**

Field	CO <sub>2</sub> reductions (kt-CO <sub>2</sub> /year)	Reason for contribution (representative examples)
Housing	935	Resolving energy issues (creation, conservation, storage) through installation of solar panels, SMART HEIM Navi HEMS and storage batteries
Infrastructure	669	Renew deteriorated pipes using SPR non-open cut method reduces resource consumption and waste, while also minimizing distance of closed roads during construction, thus avoiding traffic and improving fuel consumption of commuters
Automobiles and Transportation	2,534	S-LEC interlayers for use in laminated glass for automobile front windshields. High-performance, insulated and soundproof interlayers improve fuel efficiency by reducing vehicle weight and increasing air conditioner efficiency
Electronic materials	738	Intermediate materials that contribute to better energy efficiency for LEDs, etc.
Other	537	—
Total	5,413	—

The majority of reductions were from Housing, Automobiles and Transportation and intermediate electronic materials.

In Housing, for instance, power generation from solar panels and energy efficiency achieved through products such as improved insulation or “SMART HEIM Navi” HEMS reduced CO<sub>2</sub> generated by customers during their daily lives. KYDEX sheets which is used for applications such as aircraft seat frames or railway passenger window frames, helped to reduce CO<sub>2</sub> during transport by reducing weight of vehicle. S-LEC interlayer film for laminated glass, which is used in automobile windshields, also helps to reduce CO<sub>2</sub> produced during driving by reducing weight and by improving air conditioner efficiency through better insulation and soundproofing.

While rarely seen by consumer eyes, SEKISUI has also developed specialized foam materials that contribute to reducing CO<sub>2</sub>. “Thermobreak” pipe insulation, developed for the ASEAN market, improves energy efficiency through greater insulation. “High-performance Foam Tapes”, with excellent impact absorption, contribute to better performance for energy-efficient liquid crystal displays. In addition, “Alveosoft”, which is used in floors of whicles primarily in Europe, contributes to better fuel efficiency by reducing weight.

Moving forward, SEKISUI aims to increase its contributions by improving performance, adding new functionality and penetrating into new markets where SEKISUI's exceptional products can continue to contribute to reduce CO<sub>2</sub> emissions.

#### 4-5. Adapting to Climate Change through Products and Businesses

SEKISUI's two businesses that address adaptation most directly are its housing and infrastructure businesses. [Housing]

SEKISUI's disaster-resistant, highly reliable and durable prefabricated modular houses uniquely contribute to climate change adaptation. As the housing is produced using modular plant production, production is not impacted by the effect of disasters caused by climate change, and modules can also be kept in inventory for use during disaster response. They can also be used as quickly available temporary housing for people forced to evacuate from their homes dues to natural disasters caused by climate change. These properties, alone, already contribute to climate change adaptation. Not only can SEKISUI's highly reliable and trustworthy prefabricated unit homes help to reduce the physical and mental stress of evacuation and support recovery, but after evacuation ends the housing can also be moved and, with the necessary maintenance, reused. This helps to reduce resource consumption.

And outfitting this housing with air conditioning systems such as “Kaiteki Airy”, which improves insulation and airtightness, ensures a pleasant environment with minimal energy use despite the warming effects of climate change. As of fiscal 2018, penetration for ZEH, previously-mentioned, had reached 73%. Equipping houses with batteries capable of storing power created by solar panels prevents disruptions to lifestyles that could be caused by more frequent natural disasters due to climate change. Use of “V to H (Vehicle to Home)” systems to link housing with electric vehicles allows residents to store large amounts of power, allowing them to travel to safety or transport necessary supplies.

[Infrastructure]

Flooding and other increased risks from climate change require stronger water, sewage and other infrastructure. Water related risks, in particular, affect some regions more so than others. In advanced nations where 50 or more years have passed since water infrastructure was installed, new construction methods and technologies are required that use less energy and materials and leave infrastructure unavailable for shorter periods of time. Emerging nations, meanwhile, where sufficient urban infrastructure is not in place due to population increases and rapid industrialization and urbanization, require construction of new, highly efficient, highly durable infrastructures. For the former, SEKISUI offers trenchless construction methods such as SPR. For the latter, collaboration with local companies will establish foundation of infrastructure as quickly as possible.

## **5. Closing Message**

There is much uncertainty involved with climate change. Under the governance systems described above, SEKISUI CHEMICAL Group has analyzed the risks and opportunities associated with climate change and, with a better understanding of the impacts involved, has formulated strategies for the future. These strategies fall into four basic scenarios, based on two climate change scenarios and a range of possible changes to society. This report contains climate-related financial disclosures that demonstrate that SEKISUI is pursuing these strategies and taking effective steps as a sustainable company that will persist regardless of which future comes to pass--one able to contribute to the environment and society. By continuing to explore risks and opportunities and revising strategy, and contributing as always to a more sustainable Earth, SEKISUI CHEMICAL Group aims to remain a highly sustainable company that will achieve continuous growth.

END