

# Addressing Climate Change

## — Information Disclosure Based on the TCFD Recommendations

Climate change attributable to global warming arising from a worldwide increase in greenhouse gas (GHG) emissions is one of the most serious issues facing the world today. The artience Group understands that responding to climate change is a material management issue with a huge impact on business activities. In November 2020, we expressed support for the Task Force on Climate-related Financial Disclosures (TCFD.) Currently, we conduct activities for addressing climate change such as reducing CO<sub>2</sub> emissions towards carbon neutrality in 2050 in accordance with our Sustainability Vision “asv2050/2030,” which is the axis of the Group’s sustainability strategy. We also disclose information in accordance with the TCFD recommendations.

### Governance

The Sustainability Committee, which oversees the sustainability activities of the entire artience Group—including climate change—and promotes them across the organization, is supervised by the Board of Directors via the President and Representative Director. Important issues are discussed and resolved by the Group Executive Committee, and then reported to the Board of Directors for approval.

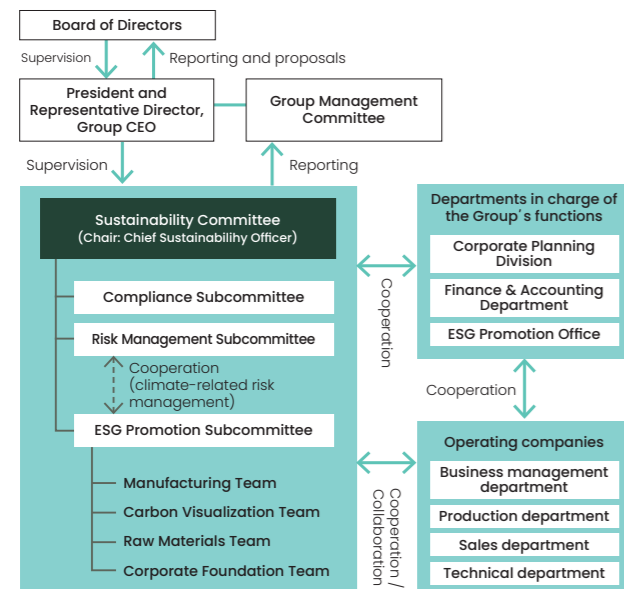
The President and Representative Director oversees the Sustainability Committee as the chief supervisor for the Group’s response to climate change, taking ultimate responsibility for management decisions relating to the Group-wide sustainability activities, and appointing a Chief Sustainability Officer as the executive officer in charge of sustainability activities.

Subordinate to this committee, the ESG Promotion Subcommittee plans and implements specific activities relating to groupwide sustainability, including the response to climate change. To increase the effectiveness of activities to address climate change, the ESG Promotion Office, established in July 2023, takes the initiative in practical processes such as information gathering on climate actions, identification, analysis and evaluation of risks and opportunities, the drafting of internal rules and information disclosure. It is stepping up systematic collaboration with the management team, the group function division, the corporate management divisions of operating companies and other stakeholders to incorporate these activities more deeply into management and business plans and to give shape and budgets to activities to meet climate-related goals.

### Report on climate change to management (Board of Directors and Group Management Committee)

	Contents of report
June 2023	Report on the content of climate change information disclosures (second phase) based on the TCFD recommendations (published in Integrated Report 2023)
September 2023	Prepares decarbonization roadmaps at individual facilities and reports on progress of global CO <sub>2</sub> emissions (Sustainability Conference)
February 2024	Reports on activities in FY2023 and explanations on the activity policy for FY2024 at the Sustainability Committee meeting

### System for addressing climate change (FY2024)



Committees / Organizations	Roles and activities in addressing climate change
Board of Directors	Approves and supervises all initiatives relating to climate change that have been resolved by the Group Management Committee.
Group Management Committee	Discusses and resolves important issues relating to addressing climate change and reports to the Board of Directors.
Sustainability Committee	Discusses specific policies, plans and measures to tackle climate change and reports them to the Board of Directors and to the Group Management Committee.
ESG Promotion Subcommittee	Drafts and formulates specific policies, plans and measures against climate change and carries out activities in collaboration with departments and subsidiaries. Holds regular monthly meetings. <b>Manufacturing Team:</b> Support for implementing measures to reduce greenhouse gas (GHG) emissions at each production site, aggregation and sharing of information, cross-organizational planning. <b>Carbon Visualization Team:</b> Formulates rules, builds systems, and structures the organizational framework relating to visualization of CFP. <b>Raw Materials Team:</b> Works to build a sustainable supply chain and transition to low-carbon raw materials to reduce Scope 3 emissions. <b>Corporate Foundation Team:</b> Strategy development and disclosure practices for climate change information disclosure based on the TCFD recommendations.
Risk Management Subcommittee	Identifies, analyzes, and evaluates climate-related risks in the same way as other corporate risks, in cooperation with the ESG Promotion Subcommittee. Meetings are held twice a year.
Departments in charge of the Group's functions	Carries out practical work, such as the incorporation of climate actions into management plans, earmarking of budgets for them, legal actions, strengthening of human capital, and the distribution of information to insiders and outsiders.
ESG Promotion Office	Incorporates climate actions more intensively into management and business plans, develops specific activities for climate goals and appropriates budgets to these activities in collaboration with the management layer, the group function division and corporate management divisions of operating companies.
Operating companies	In collaboration with the ESG Promotion Subcommittee and the business divisions (corporate management, production, technical and sales) separately work to incorporate climate-related actions into business plans, carry out the actions, collaborate with raw material suppliers, change the production process, conduct marketing and sales promotion of low-carbon products and undertake research and development efforts for technologies aimed at decarbonization.

### Risk Management

#### [Risk / Opportunity Management Process]

The Group has established a group-wide risk management system centered on the Risk Management Subcommittee, which is a subordinate organization of the Sustainability Committee. We recognize that climate-related risks, like other corporate risks, are factors that affect the sustainable growth of a Group, and that taking appropriate strategic measures will lead not only to preventing the actualization of risks and the mitigation of their impact when they actualized, but also to opportunities such as increasing business earnings and improving the Group’s reputation in the market. The ESG Promotion Subcommittee manages climate-related risks and opportunities in cooperation with the Risk Management Subcommittee, applying the same management process as for corporate risks in general.

The ESG Promotion Subcommittee identifies and as-

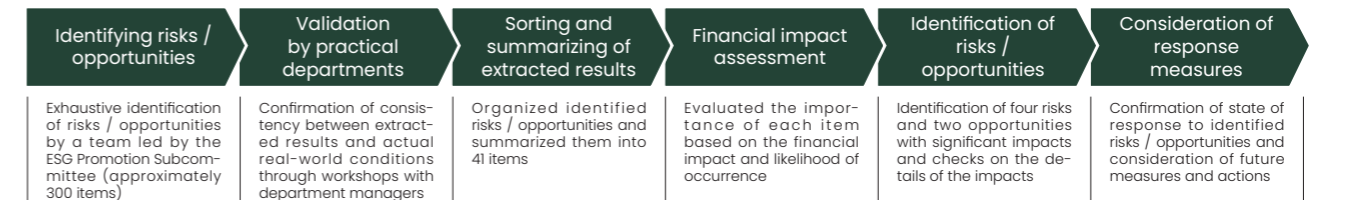
esses climate-related risks and opportunities and reports them to the Group Management Committee and to the Board of Directors. It organizes a Sustainability Conference as a groupwide meeting on an annual basis to provide not only the management layer and managers of divisions in group companies but also general employees with opportunities to hear discussions in a bid to share information and views in the Group. It also provides education and training related to climate change by means of e-learning and webinars to all employees to raise climate awareness, to update them with the latest information and to develop their ability to perceive risks. Management layer and Group companies incorporate response measures and action plans based on these risks and opportunities into their management plans and business plans, and reflect them in specific measures.

#### [Process for identifying and assessing risks / opportunities (conducted from December 2021 to May 2022)]

Using a matrix of the categories of the risk and opportunity categories defined by the TCFD recommendations (Transition Risks: Policy and Legal, Technology, Markets, and Reputation; Physical Risks: Acute and Chronic; Opportunities: Resource Efficiency, Energy Sources, Products and Services, Markets, and Resilience) and the Group’s value chain processes (procurement, production, logistics, sales, R&D, management, use, and disposal,) the ESG Promotion Subcommittee exhaustively extracted risks and opportunities associated with climate change. The validity of the extracted results (i.e. whether or not they are matched with the practical work and the

on-the-spot situation) was confirmed through a workshop for department managers at each Group company (held in February 2022 with 34 participants.) The subcommittee then summarized the approximately 300 identified risks and opportunities into 41 items, and evaluated their impact on two axes: financial impact and likelihood of occurrence in accordance with two different climate change scenarios (1.5°C and 4°C.) In this way, we identified four key risks and two key opportunities that are considered especially important to the Group based on the evaluation results.

#### Process for identifying and assessing climate-related risks / opportunities



#### Risks / opportunities organized and summarized in the process of identifying risks / opportunities (partial list)

Transition Risks	Policy and Legal	<ul style="list-style-type: none"> <li>• Cost increases due to introduction of carbon taxes and soaring emissions trading prices</li> <li>• Toughening and/or changing of environmental regulations on GHG emissions, etc., and their impact on production facilities</li> </ul>
	Technology	<ul style="list-style-type: none"> <li>• Decline in the value of existing technologies accompanying the transition to a decarbonized society</li> <li>• Increasing costs of investment in equipment, human resources development and R&amp;D accompanying the transition to low-emission products</li> </ul>
	Market	<ul style="list-style-type: none"> <li>• Decline in demand for packaging- and printing-related items, etc., accompanying the transition to a circular economy and decarbonization</li> <li>• Rise in raw material and energy prices due to the use of non-fossil and recycled raw materials and compliance with regulations</li> </ul>
Physical Risks	Reputation	<ul style="list-style-type: none"> <li>• Declining preference due to inability to demands from customer for reducing GHG emissions</li> </ul>
	Acute	<ul style="list-style-type: none"> <li>• Failure to fulfill supply responsibilities or loss of business opportunities due to supply chain disruptions as a result of climate-related disasters</li> <li>• Damage to equipment and facilities caused by climate-related disasters, increased recovery costs and loss of business opportunities due to infrastructure stoppages</li> </ul>
	Chronic	<ul style="list-style-type: none"> <li>• Increase in measures and relocation costs for bases located in flood and drought risk areas</li> </ul>
Opportunities		<ul style="list-style-type: none"> <li>• Increase in sales due to growing customer demand for products that lead to energy conservation, reduction of GHG emissions and recycling of resources</li> <li>• Capture of business opportunities due to market creation and growth for new climate-related businesses (carbon-neutral materials and products for combating infectious diseases)</li> </ul>

Strategy

[Basic policies and strategies]

The artience Group recognizes that the policies and measures taken by national and local governments in response to global climate change have a significant impact on market conditions, the procurement of raw materials and consumer preferences and may have a strong impact on business continuity and business performance in the future. We have set out the "Policy

on Climate Change" (established in April 2022, revised in January 2024,) analyze these risks and opportunities, reflect them in our management plans and business plans, and engage in appropriate activities to address climate change.

**WEB** For the Policy on Climate Change, visit our website and click on [Sustainability > Environment > Response to Climate Change > Climate change information disclosure based on TCFD recommendations.]

[Scenario analysis]

The purpose of scenario-based analysis is to grasp and understand risks and opportunities that will arise from anticipated climate change and what kind of impact they will have on the Group, confirm the resilience of the Group's sustainable growth strategy in the expected future, and consider the need for further measures.

The Group carried out the scenario analysis on the four risks and the two opportunities it identified by

referring two climate change scenarios. One is a 1.5°C scenario, which envisages a world in which various measures are taken to limit the average temperature rise to 1.5°C in comparison with pre-industrial levels. The other is a 4°C scenario, which envisages a world in which the impact of physical risks due to climate change increases with the existing policies and systems remaining in operation as they are.

Categories	Risks / Opportunities	Financial Impact / Expressivity		Periods of increased impact
		1.5°C scenario	4°C scenario	
Transition risks: Legal, Market	Rising raw material and energy prices	Impact 3 / Expressivity 3	Impact 2 / Expressivity 3	Mid
Transition risks: Technology, Market, Reputation	Decline in demand for packaging- and printing-related items	Impact 3 / Expressivity 3	Impact 2 / Expressivity 2	Short
Transition risks: Policy and Legal	Increased impact of carbon prices on costs	Impact 3 / Expressivity 3	Impact 2 / Expressivity 3	Short
Physical risks: Acute	Loss of business opportunities due to the intensification of climate-related disasters	Impact 2 / Expressivity 2	Impact 3 / Expressivity 3	Long
Opportunities: Energy Source, Products and services	Increased sales of low-emission products	Impact 3 / Expressivity 3	Impact 2 / Expressivity 3	Short
Opportunities: Products and Services, Market	Acquisition of business opportunities such as materials for combating extreme heat and infectious diseases	Impact 2 / Expressivity 3	Impact 3 / Expressivity 3	Long

Financial impact: 3=impact of several billion JPY or higher; 2=impact of around one billion JPY; 1=impact of less than one billion JPY  
Likelihood of occurrence: 3=already occurring at the present time, or almost certain to occur in the future; 2=relatively high likelihood of occurrence; 1=low likelihood of occurrence  
Period of increase in impact: Short-term = around 1 year (period of annual plan) Medium-term = around 3 years (period of medium-term management plan)  
Long-term = around 10 years (interim target year of TSV2050/2030 = period up to FY2030)  
For our 1.5°C scenario, we refer to the IEA World Energy Outlook: Net Zero Emission by 2050 Scenario and IPCC: SSP1-1.9 scenario.  
For our 4°C scenario, we refer to IEA World Energy Outlook: Stated Policy Scenario and IPCC: SSP5-8.5 scenario.  
Scope of analysis: Existing businesses of the entire Group and new businesses anticipated at this time

[Quantitative analysis①: Amount of impact from carbon taxes]

As a Group whose main business is chemical manufacturing, and which has a large amount of CO<sub>2</sub> emissions from its production activities, we recognize that the introduction of carbon taxes in the regions where we operate both in Japan and overseas will have a strong impact on the Group's finances.

The Group has therefore quantitatively analyzed the extent to which the interim targets of the asv2050/2030

sustainability vision – CO<sub>2</sub> emissions: 35% reduction in Japan (from the FY2020 level,) 35% reduction in other countries (compared to the FY2030 BAU) – will reduce the financial impact of carbon taxes. For both scenarios used in the analysis, we confirmed that achieving the asv2030 targets would reduce the impact by approximately 38%.

	1.5°C scenario	4°C scenario
Carbon tax per ton of emissions *1 (2030)	14,950 JPY/t-CO <sub>2</sub>	7,475 JPY/t-CO <sub>2</sub>
FY2030BAU *2	CO <sub>2</sub> emissions	Japan: 88,400 t-CO <sub>2</sub> Overseas: 146,000 t-CO <sub>2</sub>
	Impact from carbon tax	3.51 billion JPY
When asv2030 targets are achieved	CO <sub>2</sub> emissions	Japan: 50,000 t-CO <sub>2</sub> Overseas: 95,000 t-CO <sub>2</sub>
	Impact from carbon tax	2.17 billion JPY
Difference	-1.34 billion JPY	-0.66 billion JPY

\*1 For a carbon tax per ton of emissions, we referred to the IEA World Energy Outlook 2021. The 1.5°C scenario quotes the carbon tax price for developed countries given by the Net Zero Emission by 2050 Scenario, while the 4°C scenario quotes the EU carbon tax price given by the Stated Policy Scenario.

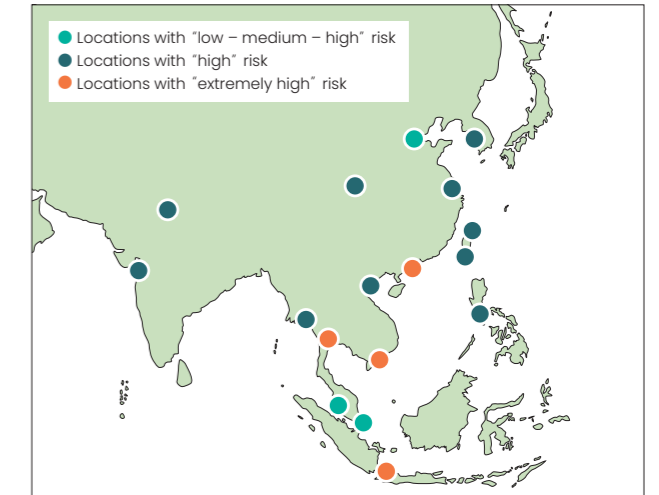
\*2 The FY2030 BAU assumes that domestic and overseas activity (net sales) will increase by 15% and 23%, respectively, in comparison with FY2020, and that emissions intensity will remain unchanged from FY2020.

[Quantitative analysis②: Amount of damage in the event of flooding in areas with high water risk]

The Group uses the World Resources Institute (WRI) water risk assessment tool Aqueduct 3.0 to assess physical risks (quantitative and qualitative,) water stress, flood risk, and regulatory and reputational risks on a river basin level. As a result, more than half of our overseas offices in Asia (Southeast Asia, India, China, Taiwan, and South Korea) have been assessed as having some kind of water risk (high to significantly high.) In particular, the risk of flooding is significantly high in China (South China,) Vietnam, Indonesia, and Myanmar.

This time, we estimated the amount of damage caused by flooding at business sites located in areas indicated as having a high flood risk. At business sites located in such highrisk areas, we are working to reduce risks by deploying countermeasures implemented by Toyo Ink (Thailand) Co., Ltd. (Thailand)—which has experienced large-scale flood damage in the past—across the board, and by conducting regular drills in preparation for the occurrence of floods.

■ Assessment of flood risk by Aqueduct



■ Amount of damage in the event of flooding\*1 at business sites in areas with high flood risk (estimated)

Category	Specific damage	Number of locations	Amount of damage (estimated)
Direct damage*2	Damage to buildings (offices, factories, warehouses, etc.)	3	2,429 million JPY
	Damage to equipment (production equipment, vehicles, office equipment, etc.)	3	6,618 million JPY
	Damage to inventory (products, work in process, raw materials, etc.)	3	6,816 million JPY
Indirect damage*3	Opportunity losses due to shutdowns	3	7,326 million JPY
Other damages		—	—
<b>Total</b>			<b>23,189 million JPY</b>

\*1 Under the climate scenario of a 4°C rise at the end of the 21st century, we assumed that floods would occur on a scale of about once every 100 years.  
\*2 We set damage ratios for each depth of inundation (flooding,) and estimated the amount of damage to buildings, equipment, and inventory at each business site.  
\*3 We set an average number of shutdown days for each depth of inundation, estimated the number of days of shutdown for each affected site, and estimated the amount of opportunity losses.

[Quantitative analysis③: Reducing CO<sub>2</sub> emissions by using environmental value product lines that contribute to sustainability]

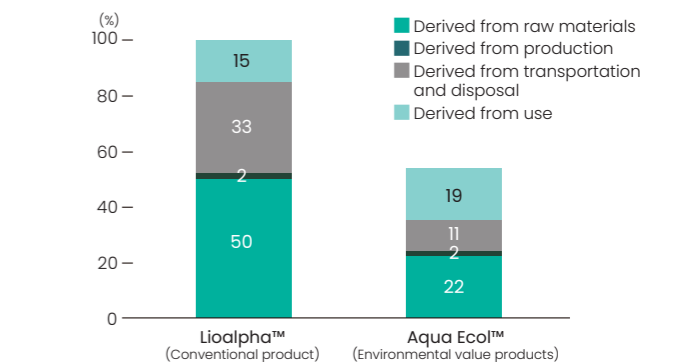
Under our asv2050/2030 Sustainability Vision, we added criteria for products with lifestyle value (value that can contribute to the improvement of the sustainability of society) to our existing environmental value criteria for environmentally friendly products and re-defined them as sustainability-enhancing products. The Group is accelerating R&D efforts and shifting its product portfolio with the goal of achieving a sales ratio of 80% or more of these sustainability-enhancing products by fiscal 2030.

The environmental value products line is a set of functional products that can reduce environmental impact throughout the product lifecycle, such as through the use of low-carbon raw materials, product weight reduction (achieving the same performance as conventional products with less amounts used,) and energy saving during use. As an example, we have quantified the reduction rate for CO<sub>2</sub> emissions that can be achieved by shifting to water-based raw materials of gravure inks for packaging materials, which the Group is working to achieve.

We estimated CO<sub>2</sub> emissions from two products at four different stages of raw materials, production pro-

cess, transport and disposal, and consumption. One of the products is the Lioalpha™, the Group's conventional gravure ink for packaging materials. The other is the Aqua Eco™, a product with alcohol-water solution as solvent. If the emissions from the conventional product are expressed as 100, those from the water-based ink are confirmed to be as low as 54.

■ The effect of environmental value products in reducing CO<sub>2</sub> emissions in their life cycle (gravure inks for packaging materials)



\* The figures represent estimates calculated using the Inventory Database for Environmental Analysis (IDEA) version 2.3. Our recommended conditions apply to the dilution ratio of solvent and others.

# Addressing Climate Change – Information Disclosure Based on the TCFD Recommendations

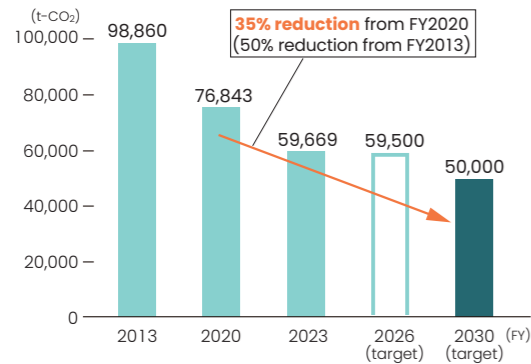
## Metrics and Targets

### [Metrics⓪: CO<sub>2</sub> emissions – Indicator for risk]

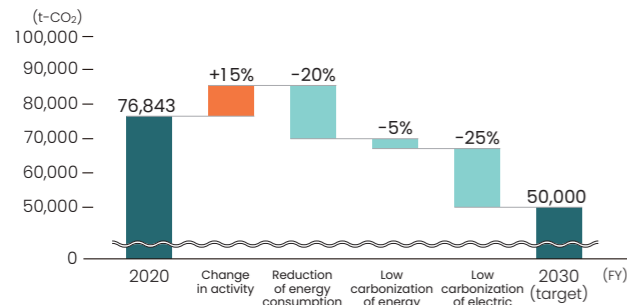
Since launching the “CO<sub>2</sub> Reduction Project” in FY2010, the artience Group has been striving to reduce CO<sub>2</sub> emissions from its production bases in Japan and overseas.

Our Sustainability Vision asv2050/2030 declares that the artience Group will reduce CO<sub>2</sub> emissions from its production activities and achieve carbon neutrality by 2050. In addition, it sets specific interim targets of reducing CO<sub>2</sub> emissions in Japan by 35% (50,000 t-CO<sub>2</sub>) from the FY2020 level by FY2030 and CO<sub>2</sub> emissions overseas by 35% (95,000 t-CO<sub>2</sub>) from the business-as-usual (BAU) level in FY2030.

### ■ Changes in CO<sub>2</sub> emissions and targets (Japan)



### ■ Major reduction measures and assumed reduction amount (Japan)

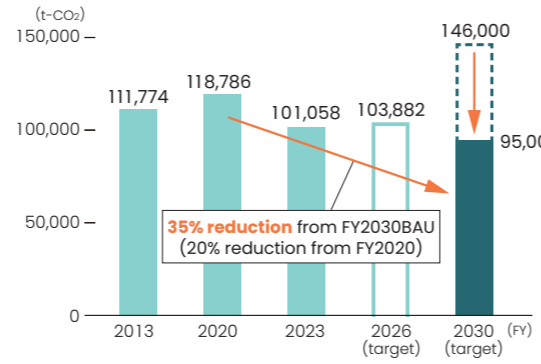


### [Case: Completion of a Nearly ZEB Technical & Administration Building]

In March 2022, Toyochem Co., Ltd.’s Kawagoe Factory completed construction of a “Nearly ZEB” certified Technical & Administration Building. This certification is granted to buildings where effective energy consumption has been reduced by 75% or more. In addition to energy-saving measures such as reducing air-conditioning load by adopting horizontal eaves that limit direct solar radiation, the effective energy consumption of the building was reduced by 76% by creating energy through on-site PPA model solar panels utilizing subsidies from Japan’s Ministry of the Environment (MOE). The building was awarded Nearly ZEB certification and the highest rating (five stars) under the Building-Housing Energy-efficiency Labeling Sys-

Our measures to achieve these targets can be classified into three aspects: reducing energy consumption, shifting to low-carbon energy, and shifting to low-carbon power. In Japan, co-generation systems are in operation at many production bases. Our efforts will center on shifting to low-carbon energy, such as changing fuels for system into lower-carbon fuels and electrification of production facilities. Overseas, the electrification of production facilities is more advanced. There, we will focus on shifting to low-carbon energy, such as electric power generated from renewable energy.

### ■ Changes in CO<sub>2</sub> emissions and targets (overseas)



Direction of measures	Major reduction measures
Reduction of energy consumption	<ul style="list-style-type: none"> <li>Energy conservation (eliminating energy loss in processes)</li> <li>Production process reform from an energy-saving perspective</li> </ul>
Low carbonization of energy	<ul style="list-style-type: none"> <li>Electrification of production equipment (reducing direct emissions)</li> <li>Preparation and research for the use of LNG alternative fuels</li> </ul>
Low carbonization of electric power	<ul style="list-style-type: none"> <li>Introducing low-carbon power</li> <li>Introducing renewable energy equipment</li> </ul>

tem (BELS). Toyochem also won the Energy Conservation Center, Japan (ECCJ) Chairman’s Award in the Best Practice Category in the 2022 Energy Conservation Grand Prize. It was awarded for advancing energy conservation activities that started at this technology management building and for introducing the energy conservation method across the organization.



The new Technical & Administration Building at Kawagoe Factory, Toyochem Co., Ltd. (left)  
ECCJ Chairman’s Award trophy at the 2022 Energy Conservation Awards (right)

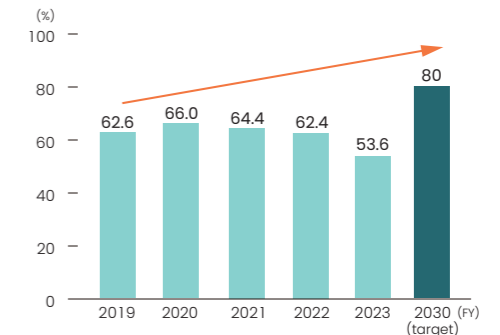
### [Metrics⓪: Sales ratio of sustainability-enhancing products – Indicator for opportunity]

The artience Group began our efforts to improve the environmental friendliness of our products in the early days of the Group. In the 1990s we started placing environmentally friendly products on the market. Our Sustainability Vision asv2050/2030 defines our products that help improve the sustainability of society as sustainability-enhancing products. This category of products offers not only the environmental value provided by environmentally friendly products but also lifestyle value, which includes comfort, health, welfare, safety and peace of mind in people’s lives. Through the Group’s scenario analysis, we have identified two climate-related opportunities, namely increased sales of low-emission products and the acquisition of business opportunities such as materials for combating extreme heat and infectious diseases. Sustainability-enhancing products include products that are associated with these opportunities.

The asv2050/2030 adopts the ratio of sales of these sustainability-enhancing products to the Group’s total sales as an indicator of the Group’s climate action

and sets a target of attaining 80% or more in this indicator by FY2030.

### ■ Sales ratio of sustainability-enhancing products and targets

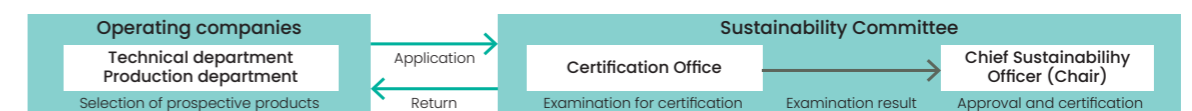


\* In FY2023, a new definition of sustainability-enhancing products was introduced under asv 2050/2030 and the scope of calculation was expanded to include overseas sales. The figures up to an including FY2022 are net sales and sales composition ratio of conventional environmentally friendly products.

### ■ Values provided by sustainability-enhanced products and their direction

Provided Value	Direction	Keywords	Examples of measures and products
Environmental Value	Decarbonization	Clean energy / new energy Energy reduction / Shift to EV-based transportation	Proposal and advanced development of materials and technologies that contribute to the acceleration of the shift to EVs (LiB materials, thermal control materials and components) Contributing to reducing CO <sub>2</sub> emissions during use (shift to UV / EB) Developing environmentally friendly new power generation systems and proposing materials for these systems
	Resource circulation	Reduce Reuse Recycle Replace	Reducing the percentage of petroleum raw materials and replacing them (shift to biomass, water-based materials) Simplification of product components, replacement with paper (biodegradable materials, functional coatings) Materials and systems that support the recycling of plastics (materials and systems supporting horizontal recycling)
	Coexisting with nature	Environmental harmony, coexistence, and purification Reduction of substances with environmental impact	Heat shielding paint, thermal insulation Soil improvement, wastewater purification, and utilization of renewable energy
	Carbon recycling		Developing Carbon Capture, Usage and Storage (CCUS) technologies, utilizing CO <sub>2</sub> -derived raw materials
Lifestyle Value	Medical / healthcare area	Prevention / diagnosis	Development of diagnostic materials and systems which lead to the early detection and prevention of diseases and the reduction of risk of being affected by diseases
		Medical treatment	Development of pharmaceutical and medical materials which contribute to advanced therapies and self-care
		Safety / security	Provision of safe, reliable products which do not affect living bodies (do not contain harmful substances)
	Communication / Electronics / Digital area	High-speed, large-capacity communication	Development of next-generation materials which support photonics, high-speed, large-capacity transmission, and high-speed computing
		Advanced sensing	Provision of key materials aimed at the development of a sensor society and a society connected via IoT
Big data	Developing technologies which lead to a convenient society based on the utilization of data		

### ■ Program for certification of sustainability-enhancing products



The Group’s products are examined based on specific sustainability evaluation items. They include orientation to the environmental value and the lifestyle value, definition and GHG emissions intensity. Any product that is evaluated as fulfilling the certification criteria is certified as a sustainability-enhancing product. The Sustainability-Enhancing Products Certification Office

conducts the examination for certification. The Chief Sustainability Officer, who also chair the Office, grants approval for examination results and authorizes certification. The certification criteria are reviewed regularly in accordance with changes in sustainability requirements in the market and in society.