

# CSR REPORT 2023

Corporate Social Responsibility  
April 2022-March 2023

## Shaping a Sustainable Society with Engineering Plastics



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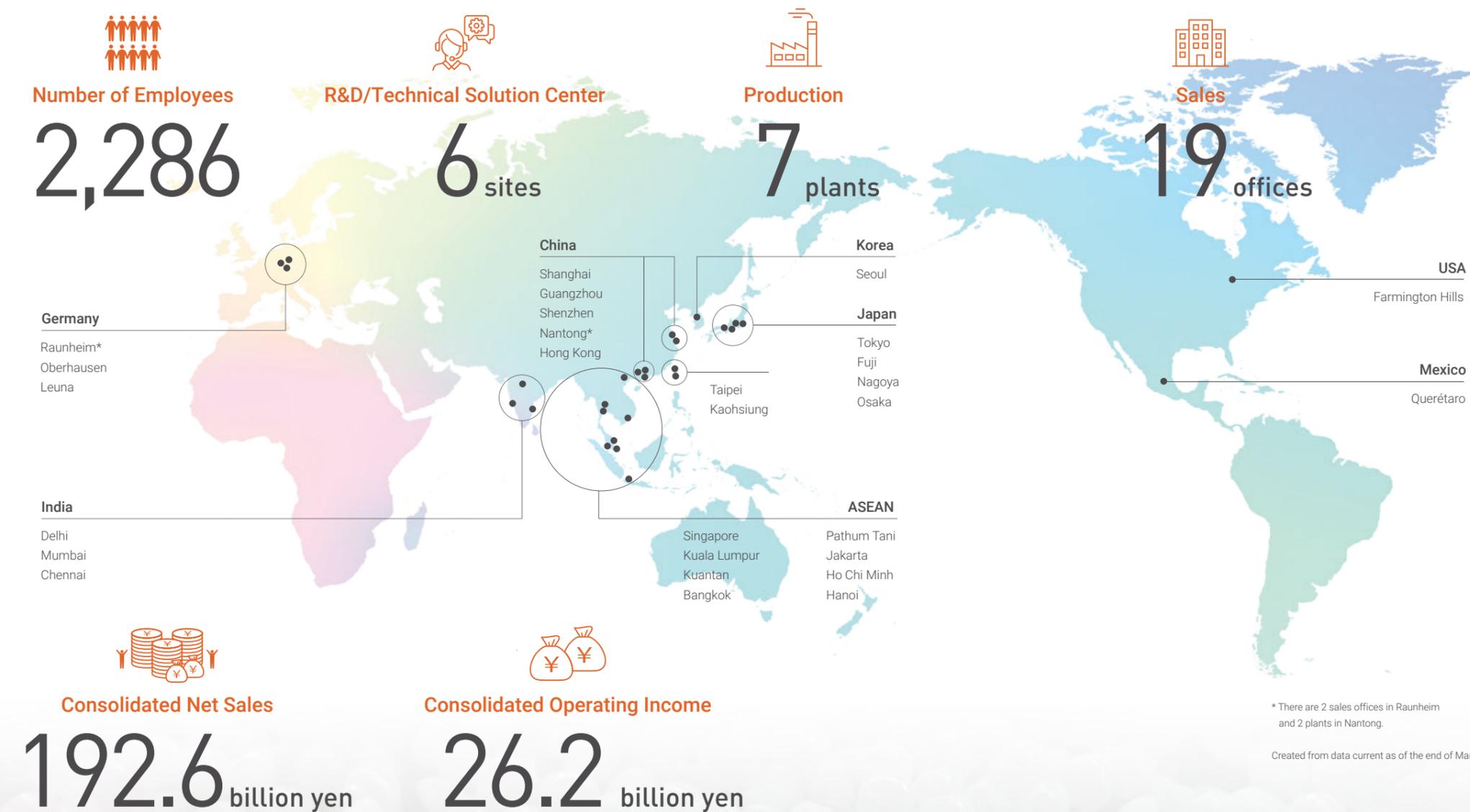
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**Polyplastics**  
DAICEL Group

## Supporting global manufacturing with engineering plastics

Polyplastics is Japan's first specialized manufacturer of engineering plastics. Engineering plastics are made from functional resins with such properties as superior mechanical strength and heat resistance. It is used in a variety of products, including aircraft, automobiles, home appliances, and food packaging, and is indispensable to modern manufacturing. Through its network of 32 bases spread across 13 countries and regions, the Polyplastics Group provides engineering plastics and technical support to customers worldwide.



### Corporate Outline

Company Name	Polyplastics Co., Ltd.
Established	May 1964 (Founded: June 1962)
Capital	3 billion yen
Shareholders	Daicel Corporation
Representative	Takashi Miyamoto, Representative Director and President
Number of Employees	2,286 (Polyplastics Group, as of March 31, 2023)
Business Operations	Manufacturing and sales of various types of engineering plastics and polymers

### Editorial Policy

This report contains information about the activities the Polyplastics Group conducted during the 2022 fiscal year. The term "employees" as used in this report refers to all those who work in the Polyplastics Group.

### Applicable Period

April 1, 2022 to March 31, 2023

### Organization Covered

The Polyplastics Group

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<b>Acetal Copolymer</b> <b>DURACON® POM</b> Well-balanced mechanical properties and outstanding sliding properties	<b>Polybutylene Terephthalate</b> <b>DURANEX® PBT</b> Superior electrical properties and reliability for electronic devices and components	<b>Polyphenylene Sulfide</b> <b>DURAFIDE® PPS</b> A linear polymer that is extremely tough and shock resistant	<b>Liquid Crystal Polymer</b> <b>LAPEROS® LCP</b> "Super Engineering Plastics" with thin-wall flowability that challenges assumptions about engineering plastics	<b>Cyclic Olefin Copolymer</b> <b>TOPAS® COC</b> Superior transparency and safety suited to healthcare and food packaging applications	<b>Polyethylene Terephthalate</b> <b>RENATUS® PET</b> High heat resistance and superior electrical properties rivaling those of thermosetting resins	<b>Long Fiber Reinforced Thermoplastics</b> <b>PLASTRON® LFT</b> Combining rigidity and high impact strength to expand the scope of resinification	<b>Engineering plastics fine powder</b> <b>DURAST™ Powder</b> Enabling improved properties, streamlined manufacturing process, and reduced material loss	<b>Polyetherketone</b> <b>SARPEK® PEK</b> High strength and rigidity with higher heat resistance and durability to replace metals in harsh environments
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# Shaping a Sustainable Society with Engineering Plastics

Shaping an abundant future for society through our engineering plastics business, mentioned in our Corporate Philosophy, is our Corporate Social Responsibility (CSR).

We focus on CSR both in terms of business activities and social contribution activities, while actively working to meet the expectations of the global community in SDGs, Carbon Neutrality and other areas.

# Toward a Sustainable and Abundant Future for Society



### Accelerating Polyplastics' CSR with SDGs

As part of our efforts to facilitate and strengthen CSR activities within the Polyplastics Group, we use the perspectives of the SDGs as important indicators when putting our approach to CSR into action.

## Business Activities

Contributing to Society through Our Business Activities

### Engineering Plastics Business

Contributing to the shaping of an abundant society through engineering plastics solutions

### Harmony with Environment

Reducing environmental impact and carrying out business operations in harmony with environment

### Developing Talented and Engaging Human Resources

Utilizing and contributing to the development of talented and engaging human resources

### Compliance

Prioritizing compliance and carrying out business in a socially fair and appropriate manner

### Contributing to Society

- Contributing to local prosperity
- Cultivating the next generation
- Supporting employee-led social contribution activities

## CSR Policy

With the aim of shaping a sustainable and abundant future for society, we pursue CSR in our business activities and social contribution activities as follows.

## Social Contribution Activities

Providing Opportunities for Social Improvement

## Corporate Philosophy

### MISSION

We contribute to building an abundant future society by innovation and developing talented and responsible people, through pursuing the unlimited potential of engineering plastics

### VISION

The excellent solution provider for engineering plastics

We will continue to provide the excellent solutions for engineering plastics to our customers, in technology, quality, services, supply, and all other aspects

### VALUE

#### 1. The "Polyplastics-Way": We create value together with our customers

- We always stand closest to our customers.
- We understand customers' needs by knowing our customers from the inside out.
- We continue to provide higher-than-expected value based on brilliant technology and services.
- Following the above, we build strong relationships of trust with our customers and grow and develop together with them.
- We call these activities the "Polyplastics-Way," which is our most important basic value.

#### 2. The "Polyplastics-Family": Our teamwork

- We consider each other important. We respect individuality and diversity.
- We emphasize teamwork based on mutual trust and cooperation among all employees.
- At the same time, as a team, we embrace the challenge of seeking to constantly evolve.
- We call this team the "Polyplastics-Family," which is our most important basic value.



## Meeting Requirements of the Future with Innovative Engineering Plastics Solutions

### An Accelerating Shift toward a Sustainable Society

In FY2022, there was a lockdown in China due to COVID-19 and a significant reduction in automobile production due to semiconductor shortages. The situation in Ukraine remained tense, raw material and fuel prices rose, inflation increased worldwide, logistics were disrupted, and exchange rates fluctuated significantly. Even in such a global situation, the market environment around Polyplastics showed a steady shift toward next-generation technologies, including those using networking facilitated by the introduction of 5G, alongside an increase in the electrification of automobiles and rising competition in the development of products for next-generation vehicles (CASE\*). At the same time, many countries continued to advance their environmental policies and regulations, and corporate efforts towards environmental load reduction accelerated. For example, the EU has proposed rules requiring all commercial packaging to be fully recyclable by 2030 and announced the decision to implement the Carbon Border Adjustment Mechanism (CBAM). The environment was the major theme of the K 2022 international trade fair for plastics and rubber. Given this rapid paradigm shift toward addressing environmental concerns, we have also added an environmental element to quality, cost, delivery, and technology (QCDT). Furthermore, today, it is becoming more and more important for companies to take sustainability into account, including human rights, labor, safety, and compliance.

### Aiming for a Balance between Economic and Environmental Issues

By offering an alternative to metals, our engineering plastics have enriched the quality of our customers' lives by enabling miniaturization, lighter vehicles, and longer product service lives. This shift from metals to engineering plastics will continue into the future, with products becoming smaller, vehicles becoming lighter, and more advanced functions being added to products. As more automobiles become electric, demand for electrical insulation for automotive parts will increase, and the use of engineering plastics with excellent insulation properties, including PBT and PPS, will increase. Heavier automotive batteries will force overall weight reduction to save electricity. As a result, metals will be replaced by engineering plastics more than ever before. In the connected world of vehicle-to-everything, the demand for LCP with a low dielectric constant will increase as telecommunications become more advanced. Engineering plastics are thus essential to the realization of an abundant society in the future. On the other hand, the production of engineering plastics currently consumes a large amount of energy. Society has relied heavily on CO<sub>2</sub>-emitting fossil fuels as its main energy resource since the Industrial Revolution and is now at a major turning point. Most plastics are dependent on

fossil fuels for their raw materials, which causes resource depletion. Furthermore, if disposed of improperly, they become a source of environmental pollution and pose a major challenge to sustainable society. However, actions that address economic and environmental issues are not incompatible—they can coexist. As part of the Daicel Group, we have set the high goals of realizing Carbon Neutrality by 2050 and reducing GHG emissions by 50% by 2030 compared to 2018 (Polyplastics' target is to achieve a 46% reduction per product unit compared to 2013). We consider it essential for engineering plastics to be able to contribute to a recycling-oriented society with a Circular Economy that treats waste as a resource. To overcome the industry's highest degree of difficulty, we are also committed to providing innovative solutions, including in new businesses. In FY2023, we are launching a new Re-compounding Service that will provide customers with materials of the same quality as virgin materials by strictly managing the quality of collected raw materials. In addition, the entire Daicel Group will make the raw materials of engineering plastics sustainable (biomass, etc.) and combine chemical recycling, energy recovery, and using carbon as a raw material to build a recycling scheme for all engineering plastics. In providing such innovative solutions, we believe it is essential to utilize the technologies and products of the Daicel Group and other companies in the same industry.

### Striving to Remain Our Stakeholders' First Choice

We will continue to be a "good company" so that we remain our stakeholders' first choice. Each of us has a different idea of what makes a company good. To hold on to our position as a leading company in this industry, the following two things are essential. One is we should be the first company that comes to mind when our customers and business partners are thinking of engineering plastics. The other one is to have our employees work with pride here. We are committed to meeting our stakeholders' expectations for quality, safety, environment, compliance, and a comfortable work environment as well as to continuously offering value that exceeds expectations. These expectations may present a difficult challenges for realizing a sustainable society, but there is no question that engineering plastics will be indispensable materials well into the future. Therefore, we will overcome each challenge and continue to evolve going forward as a leading engineering plastics company.

**Takashi Miyamoto**

Representative Director and President



\*Vehicles with Connected, Autonomous/Automated, Shared, and Electric/Electrified technologies

# CO<sub>2</sub> as a Resource for Engineering Plastics

## Innovative Solution making “Carbon Negative” possible

Until recently, the raw materials for engineering plastics have been derived mainly from fossil fuels. Shifting to sustainable raw materials is the new solution for achieving Carbon Neutrality by 2050, ultimately Carbon Negative.

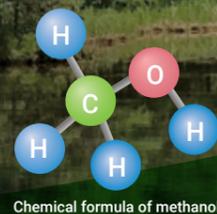
We will introduce one of the innovative solutions Polyplastics is developing.



### POM Suitable for Sustainability

POM, one of our leading products, is a resin that is extremely suitable for being made from sustainable raw materials.

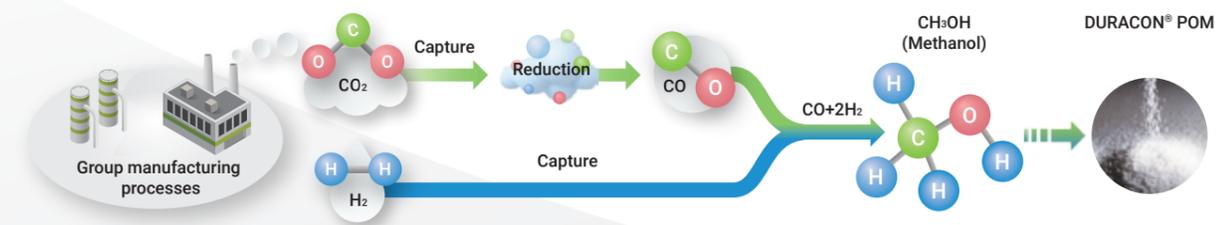
Methanol can easily be produced by fermenting biomass materials, therefore, the biomass methanol is relatively popular in the market. Given this background, we have begun manufacturing and marketing DURACON® bG-POM utilizing biomass methanol. The chemical formula for methanol is CH<sub>3</sub>OH, which means that it is made from carbon dioxide (CO<sub>2</sub>) or monoxide (CO) and hydrogen (H<sub>2</sub>). Taking advantage of this feature, we are starting to develop innovative POM.



### Challenge for Carbon Recycling to Produce POM with CO<sub>2</sub> as its Resource

Our newest product under development is POM called “POM contributing to carbon recycling,” made from CO<sub>2</sub> and H<sub>2</sub> captured from manufacturing processes of the Daicel Group.

This POM is a low PCF product because the amount of CO<sub>2</sub> used as raw material can be subtracted from the CO<sub>2</sub> emissions generated by the manufacturing process. This manufacturing process also reduces the amount of CO<sub>2</sub> emitted into the atmosphere, making it an effective measure against climate change. “POM contributing to carbon recycling” is scheduled to be manufactured and sold by FY2027.



### Realizing Carbon Negative Products

Until now, we have emitted CO<sub>2</sub> into the atmosphere as waste, but now we have developed a carbon recycling technology that uses CO<sub>2</sub> as a resource. As a result, in the future, we can see the realization of methanol that uses CO<sub>2</sub> as a raw material not only from the manufacturing process but also from the atmosphere. Using this methanol, we will work to realize Carbon Negative products with a carbon footprint of zero or less.

We will simultaneously work to reduce CO<sub>2</sub> emissions by conserving energy during the manufacturing process and using renewable energy, aiming to further reduce our products' carbon footprints.

#### Promoting the switch to sustainable raw materials in all engineering plastics

The Daicel Group has defined four types of sustainable raw materials: “biomass raw materials,” “recycled materials,” “atmospheric CO<sub>2</sub> utilization,” and “reusing waste products.” The carbon-recycling raw materials introduced here contribute significantly to the categories of “recycled materials,” “atmospheric CO<sub>2</sub> utilization,” and “reusing waste products,” but we are also making progress in the following initiatives to convert them into sustainable raw materials.

- Preparations for expanding the Re-compounding business
- Development of DURANEX® rG-PBT, made with 30% recycled PET
- Development for environmental grades of PLASTRON® LFT (grades with long cellulose fiber or recycled PP)

We are shifting from raw materials derived from fossil fuels to sustainable raw materials, both for the POM introduced here and for all Polyplastics products. We will continue to strongly implement Group-wide efforts to provide innovative solutions to realize Carbon Neutrality, ultimately Carbon Negative.

# Major Progress in Decarbonization Advanced Control Technology to TOX Process

Advanced energy conservation in processes that account for about 70% of CO<sub>2</sub>

Toward decarbonization, we have succeeded in introducing Advanced Control Technology (referred to as ACT) into the TOX process (part of POM manufacturing) at the Fuji Plant, which was considered difficult in the past. This technology can significantly reduce CO<sub>2</sub> emissions and contribute greatly to the realization of a decarbonized society. Going forward, we plan to introduce this technology to our overseas plants.



## Focusing on TOX Process

### Successful quantitative modeling of conventional operations

Manufacturing processes at chemical plants consume considerable quantities of energy. To achieve significant reductions in CO<sub>2</sub> emissions, it is vital to cut back on this energy consumption. In particular, the POM TOX process accounts for about 70% of the total CO<sub>2</sub> emissions from the Fuji Plant, therefore, there was a need for technological innovation in this process.



## Challenges for TOX Process

A TOX processing plant is a complex structure with multiple distillation columns, which makes overall optimization extremely challenging. To introduce ACT into the TOX process, we needed to quantitatively model the relationship between product quality and a huge volume of numerical data on such factors as pressure and flow rate, data that was previously qualitatively managed by operators based on their experience and expertise.



To realize more advanced production, we launched the Fuji Plant Restructuring Project in 2018 and incorporated "Production Innovations by the Daicel Way" in 2021. In this approach, we improved and stabilized the plant infrastructure by visualizing plant issues. As a result, the foundation for introducing ACT was prepared, making it possible to ensure product quality above a certain level. This approach enabled us to introduce ACT even under a complex structure. Reducing variations in quality also enabled us to achieve more optimal operation than ever before, contributing to significant energy savings.

Soft sensors that predict material composition after TOX distillation are also required in ACT. By quantitatively modeling the relationship between process data, such as pressure, and product quality, we were able to build a new soft sensor and make it possible to predict composition with a high degree of accuracy.

### What Is Advanced Control Technology?

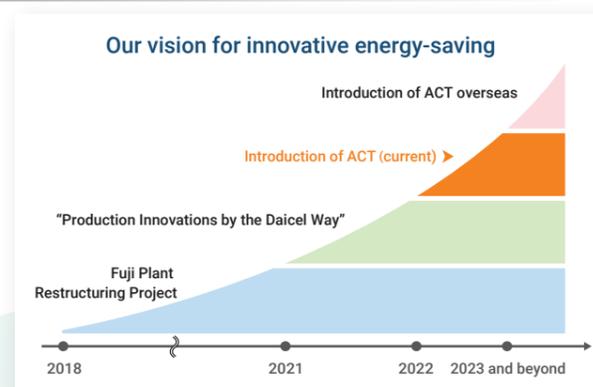
It is a technology that models and predicts the relationship between each process variable such as temperature and pressure and product quality using simple formulas and that simultaneously controls and optimizes process variables to prevent quality fluctuations. In a complex process spanning multiple distillation columns, it is difficult for operators to simultaneously track and control every aspect, so optimization through ACT is very effective.

## CO<sub>2</sub> Emissions Reduced Approximately 4,500 Tons per Year

By introducing ACT at the Fuji Plant, we successfully cut overall CO<sub>2</sub> emissions by 4,500 tons annually and steam emissions by 34,000 tons annually. This was not only due to the reduction in energy usage in the TOX process. ACT has also stabilized quality and reduced off-spec products, resulting in a significant reduction in the energy required to restart machines. As a side effect, the burden on operators has been greatly reduced by automating the operation control that was previously manual.

## Further Evolution in ACT and Expansion to Overseas Plants

Along with the shift to green energy, demand is constantly growing for ever more advanced energy conservation. Going forward, based on the technological knowledge cultivated at the Fuji Plant, we will continuously expand ACT to our overseas TOX processing plants and swiftly introduce decarbonization technology at Group companies. We will expand our Group-wide environmental load reduction efforts to achieve decarbonization through our products and services.



# Engineering Plastics Business

Contributing to shaping of an abundant society through the provision of engineering plastics solutions



## Subject 01 Innovate Engineering Plastics Recycling Business DURACIRCLE™ Re-compounding Service



As many manufacturing companies are working toward Circular Economy to realize Carbon Neutrality, we need to start actively using recycled materials in our products.

In recent years, Polyplastics has received feedback from our customers asking us to develop products using recycled materials and to provide technical know-how. These include the issues, anxieties, and requests of customers such as "We have to use recycled materials, but we are concerned about the quality," "We want to use materials with a low carbon footprint," and "We want to reduce the waste generated in the manufacturing process," etc.

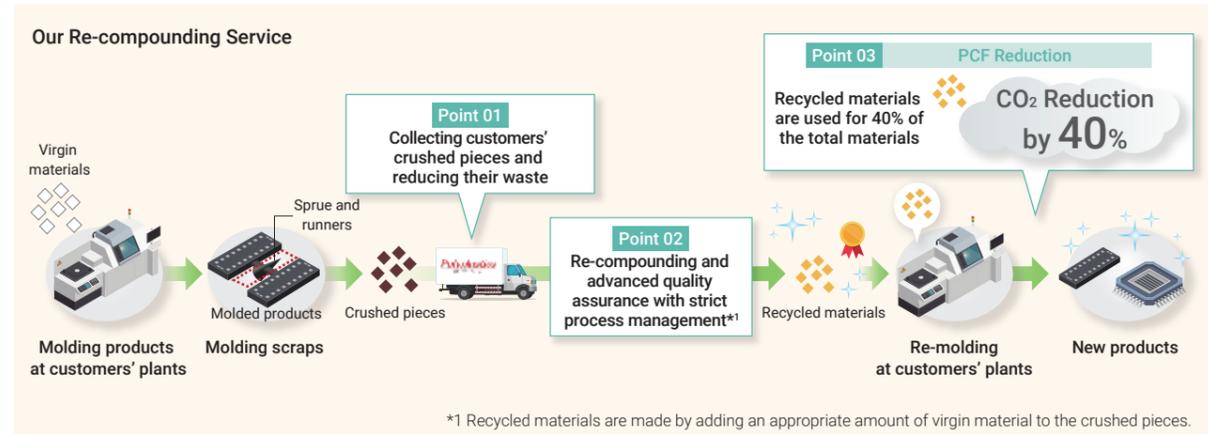
In order to solve such customer problems, we have started a new Re-compounding Service. This service is an effort to give new life to molding scraps (sprues, runners, and crushed pieces) generated in the customers' manufacturing process as a new product without discarding them.

Different from the conventional simple process cycle (regrinding), we work with our customers to manage the quality of the molding scraps, and use the manufacturing technology we have cultivated over many years to manufacture recycled materials through process control and strict inspections. The quality of this recycled material dispels any concerns customers may have. By partially using recycled materials, customers can reduce the amount of virgin materials while maintaining product quality and functionality. Therefore, this is a great business opportunity for us.

In addition, the use of these recycled materials leads to a reduction in the carbon footprint of the product, and also reduces the amount of molding scraps that customers have trouble disposing of.



Molding scraps



Besides this, we are also conducting R&D related to the recycling of used engineering plastics, which are difficult to collect as a mono material when they are mixed with other materials. Specifically, we are working on chemical recycling, energy recovery,\*2 and technologies to reuse the CO<sub>2</sub> generated during combustion. Through these efforts, we are striving to offer recycling solutions for all of our engineering plastics in the future.

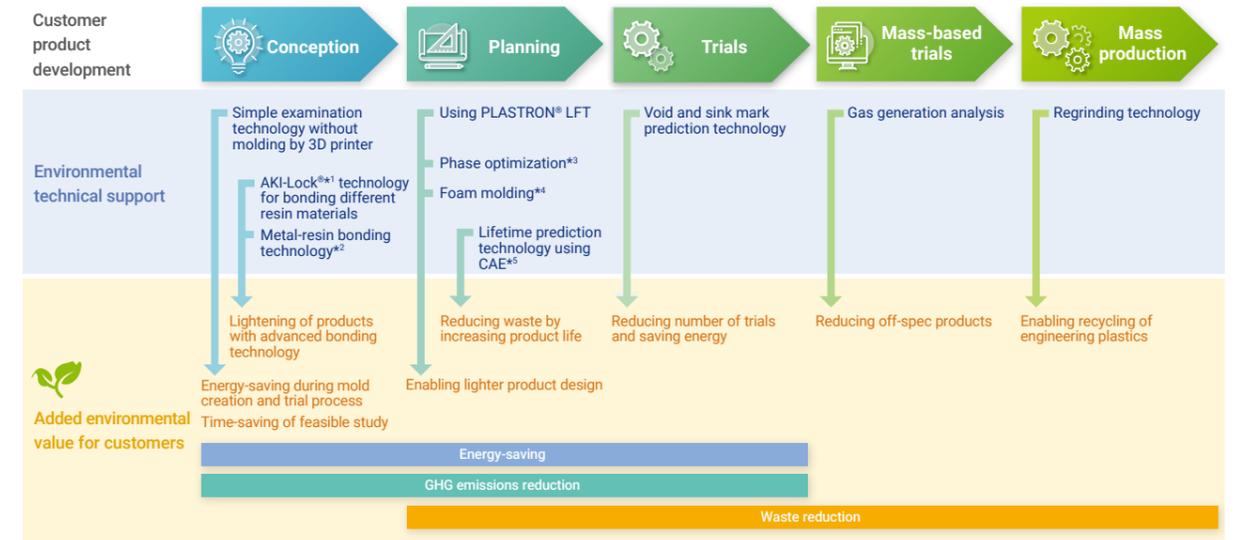
\*2 Incineration of combustible waste, alone or with other wastes, with heat recovery.

## Subject 02 A Full Range of Approaches to Development of Customers' Products for Environmental Load Reduction



We are a highly specialized engineering plastics manufacturer, and we provide technical support throughout every phase of our customers' products from conception to mass production, including in material development, processing, and performance evaluations. Using this knowledge, we provide a variety of environmental technical support to our customers to reduce CO<sub>2</sub> and waste generated at every stage of product development.

### Our Environmental Technical Support



This figure shows examples of our technology.

\*1 Our original technology for bonding different materials

\*2 Adhesive-free metal and resin bonding technology through insert molding of surface-treated metal

\*3 Technology to extract rough shapes that maximize strength and rigidity within given design parameters

\*4 Technology to reduce the weight of products by molding resins using foaming agents to create porous products

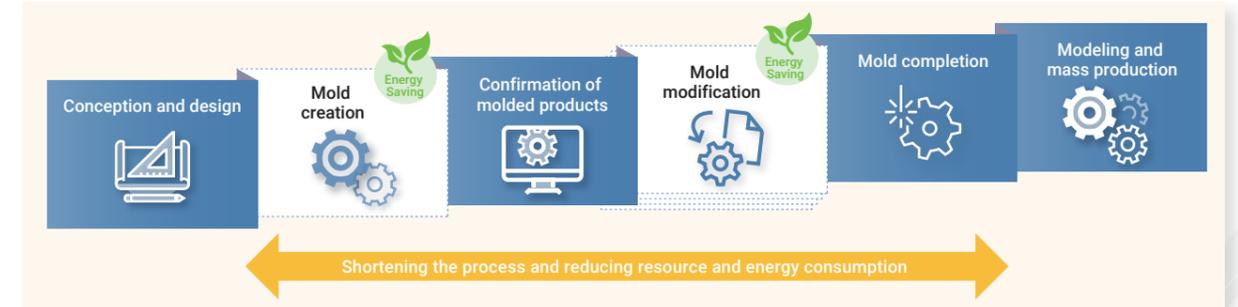
\*5 Computer Aided Engineering

## Subject 03 3D Printing as a New Option for Engineering Plastics New Solutions That Balance Economy and Environment



By establishing 3D printing technology to produce POM, we have been able to shorten our customers' product development processes, reduce energy consumption, and dramatically reduce the amount of materials and the amount of engineering plastics waste generated during the product manufacturing process.

### Shorter development process and less energy consumption without molds



Until now, the development of trial products by making molds multiple times generated many labor and other costs for manufacturing and storing molds and also consumed a large amount of energy during machine operation. However, the introduction of 3D printers without molding has significantly reduced costs and energy requirements. Furthermore, waste is also reduced and products can be manufactured using a minimal amount of materials. The amount of materials needed can be reduced by as much as half that used when die molding or cutting, depending on the situation. It has been difficult to control warpage and shrinkage during 3D-printed POM modeling, but we have succeeded in creating optimal conditions. We will continue to pursue research and development to increase the types of resins that can be used for 3D printing.

# Harmony with Environment

Reducing environmental impact and carrying out business operations in harmony with environment



## Subject 01 Environmental Promotion System

Newly established the Carbon Neutral Business Strategy Office  
Meeting customers' strong environmental needs

### GHG Reduction Targets for 2030

#### Daicel Group

Total GHG emissions (Scopes 1, 2) **50% reduction** (vs. 2018)

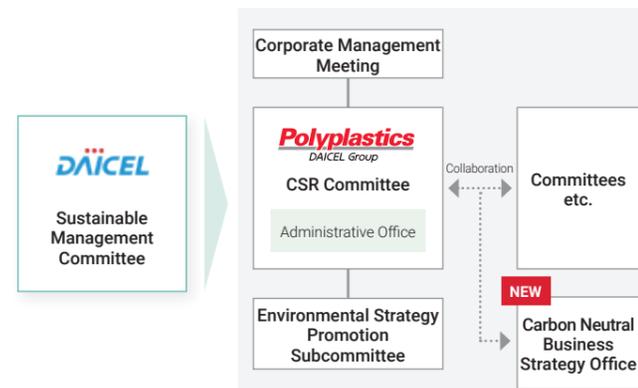
#### Polyplastics Group

PCF-focused GHG emissions intensity (including CO<sub>2</sub> derived from raw materials) **46% reduction** (vs. 2013)

### CSR Promotion System

From the perspective of CSR and strengthening business competitiveness, in April, we newly established the Carbon Neutral Business Strategy Office in addition to the existing Environmental Strategy Promotion Subcommittee.

To meet our customers' growing environmental needs, we will provide comprehensive environmental solutions, including market development that positions Circular Economy as a business opportunity and activities that address demand for GHG reduction while continuing to supply green products.



### Polyplastics Group Environmental Basic Policy

Under Corporate Philosophy, Group Code of Conduct, and Polyplastics' CSR Policy, we actively work on reducing the environmental burden in all business activities of product development, production, and sales, aiming to achieve both economic development and global environmental conservation. We will contribute to the realization of possible social development.

#### 1. Compliance with environment-related regulations

#### 2. Contribution to environment through our products

We improve the convenience of society through our products and contribute to the development of a recycling-oriented economy by reducing the size, weight and life of our customers' products. In addition, we continue to actively address to solve social issues such as environmental problems through the development and provision of products and solutions that contribute to global environmental conservation.

#### 3. Reducing the environmental burden in all business activities

- In all business activities such as product development, production and sales, we actively work on protecting the global environment, including the following initiatives.
- Regular and quantitative grasping of environmental load
  - Reduction of CO<sub>2</sub> emissions to mitigate climate change
  - Promotion of energy saving activities
  - Reduction / Reuse / Recycling of waste
  - Reduction of emissions of chemical substances and waste to air, water and soil
  - Utilization of renewable energy
  - Effective use of water resources

#### 4. Fostering an environmental mindset

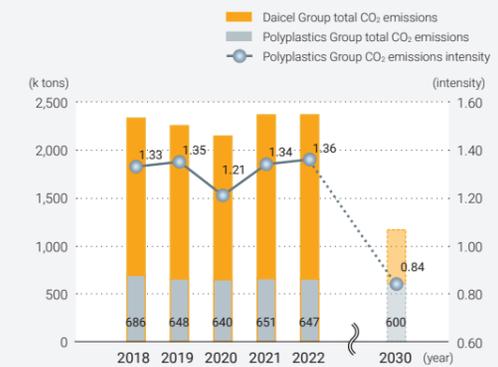
## Subject 02

## FY2022 Performance and Mid-Term Targets

### CO<sub>2</sub> Emissions Reduction

In FY2022, Polyplastics actively promoted energy-saving activities at every plant, for example, changing the ejector of the vacuum unit to a motor at the Kuantan Plant in Malaysia. On the other hand, emissions intensity slightly increased because the Daicel Group's self-consignment of electric power was suspended for about four months due to trouble. We are planning large-scale growth investment toward 2030, and CO<sub>2</sub> emissions are expected to increase accordingly, but we will realize thorough energy-saving through production and technological innovation as well as energy conversion. We will reduce emissions to the level in 2018 and aim to significantly reduce emission intensity.

Daicel Group total CO<sub>2</sub> emissions (Scopes 1, 2)



#### Mid-Term Target

By 2030  
Daicel Group  
Total GHG emissions  
(Scopes 1, 2)  
**50% reduction**  
(vs. 2018)

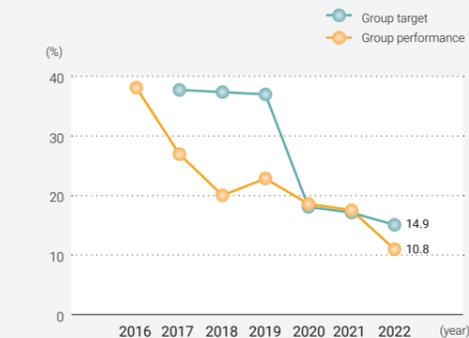
### Industrial Waste Reduction

Dust from the dust collector of the compounding machine at the Kuantan Plant that had formerly been disposed of in landfills, has been used as a raw material for cement since FY2022. This resulted in a 6.5 point decrease compared with the previous year of the landfill and incineration without heat recovery rate to 10.8%. We will continue to actively work towards the achievement of zero-emissions for the group. Until now, the landfill and incineration without heat recovery rate has been set as a management indicator, but starting in 2023, the Daicel Group set the recycling rate\* as the new indicator.

\* Recycling rate = Amount recycled (including salable resources) / Total by-products and waste generated



Landfill and incineration without heat recovery rate



#### Mid-Term Target

By 2030  
Achieve  
zero-emissions  
for the group  
(landfill and incineration without heat recovery rate under 1%)

By 2025  
Group recycling rate  
**At least 97%**

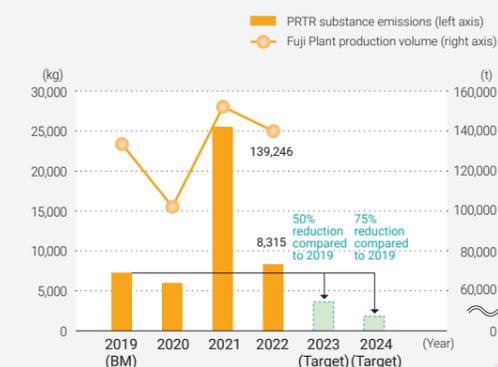
### Reducing Emissions of Chemical Substances (PRTR Substances\*1)

In FY2022, we completed repairs to the exhaust gas combustion facility, which had been shut down due to trouble that occurred in the previous year, and emissions of PRTR substances into the atmosphere were reduced by approximately 67% from the previous year. In 2023, we will install "PRTR substance emission control combustion equipment"\*2 in our major emission sources, and work toward our 2024 target of a 75% reduction in total emissions (Fuji Plant) compared to 2019 levels.

\*1 Pollutant Release and Transfer Register

\*2 Capable of reducing PRTR substance emissions by up to 95%.

PRTR substance emissions



#### Mid-Term Target

#### PRTR emissions

By 2023, reduction of **50%**  
(Fuji Plant vs. 2019)  
By 2024, reduction of **75%**  
(Fuji Plant vs. 2019)

#### VOC

Establish VOC Measurement Methods and Benchmarks by 2022

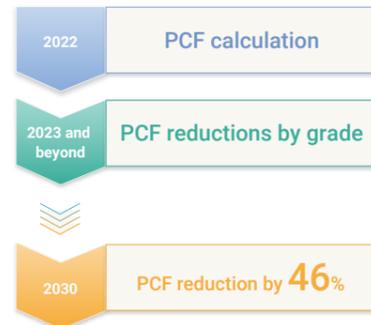


Subject  
**03 Challenge to Reduce Product Carbon Footprint by 46%**  
Realizing Optimized Visualization for Customers



In recent years, customers have started putting more importance on environmental added value when choosing a product or service in addition to the usual considerations of quality and price. Under these circumstances, there is growing interest in systems that convert GHG emissions throughout the product life cycle into CO<sub>2</sub> and display them in an easy-to-understand manner (product carbon footprint, hereinafter PCF). Polyplastics also receives the requests from our customers to disclose and reduce PCF.

To meet these needs, we have set ourselves the challenge of reducing our PCF by 46% (cradle-to-gate basis) by 2030, compared to 2013 levels. As the first step toward achieving this target, we completed the calculation and the preparation for disclosure about PCF for more than 90% of our product grades in 2022 (grades sold in FY2021).

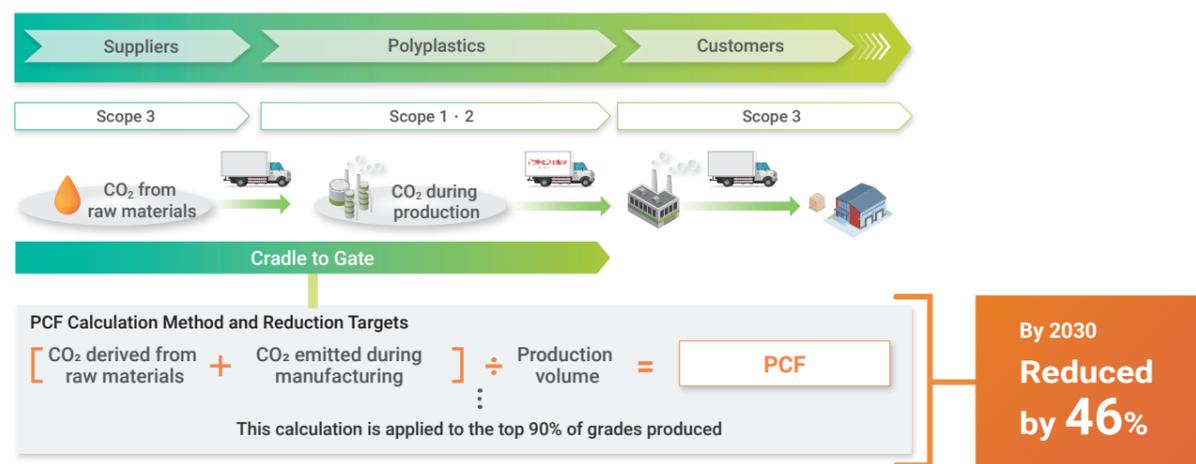


**Beyond Visualization**

PCF is calculated in line with the ISO 14067, and it is very important to consider the type of input data, the accuracy of emission factors, and how to calculate the PCF of biomass raw materials or waste materials. For example, if general-purpose inventory data is used instead of the latest primary data representing the actual state of raw materials and fuels, it will be impossible to accurately measure the effect of PCF reduction. Therefore, it is important to use as much of the latest data as possible to ensure accuracy. Also, for internal emissions (Scope 1 and 2), it is necessary to establish a system for PCF calculation with rational boundary setting and accurate data aggregation as the foundation for steadily promoting PCF reduction activities.

In FY2022, we began working towards these challenges, and now we are able to accurately calculate PCF, provide information to customers, and conduct reduction activities going forward. Furthermore, we have also established a system that provides PCF calculation results using customer relationship management (CRM) for prompt disclosure to our customers.

**PCF Calculation Method**



**Entire Supply Chain Working Together as One Team**

Now that our PCF calculation is completed, the next step toward 2030 is to reduce PCF. For the processes in which we manufacture our own monomers and polymers, we will actively promote energy conservation and energy conversion to reduce PCF. On the other hand, achieving our PCF reduction targets will also require enormous support from all of our business partners, including raw material and other material suppliers, transportation company, and subcontractors. We will share our ambitious goal throughout our supply chain and will work together as one team to implement visualization and reduction activities.

Subject  
**04 Air Conditioning System Utilizing Well Water**



In FY2022, for the first time in about 30 years,\* we built a new compound plant at the Fuji Plant. Since the location for the new facility is near a residential area, this building was constructed with materials with high thermal and acoustic insulation to minimize noise leakage and odor. There were also concerns that the building would be too hot inside during summer. To prevent heatstroke, we introduced an energy-saving air conditioning system that makes effective use of well water.

This system uses less energy than normal air conditioning to cool the air by exchanging heat between the cold temperature of the well water and the hot temperature of the intake air from indoors. In this system, impurities are not mixed in the well water, therefore it can be still utilized as industrial water after being used for air conditioning.

The amount of well water used at the Fuji Plant will remain the same, and we have already confirmed in advance that there will be no adverse effects on land subsidence, water sources, or wastewater.

The air conditioning system will start operation in the summer of 2023.



New compound plant

\* First expansion construction with new building in 14 years, and first expansion of a line for compounding in 31 years.

Subject  
**05 Award for Excellence in Odor Control**



In FY2022, the Nantong Plant (China) received an award for excellence in odor control from the government of the Nantong Economic and Technological Development Area (NETDA). We were selected as one of the first 10 out of the 70 companies within the NETDA to receive the award.

The Polyplastics Nantong Plant has been recognized for its employees' active participation in proposing improvements to odor prevention in the manufacturing process, and for the teamwork among departments in implementing such improvements. The plant manager committed human, material, and financial resources to these activities, and this was praised highly and was a main factor in receiving the award. Going forward, we will continue optimizing our manufacturing processes to reduce odors, and regularly communicate the importance of such activities.



**Examples of Odor Prevention**

Covered the wastewater treatment tank to collect and process odors



Installed 52 closed samplers to reduce the exhaust gas generated during the sampling process



Odor leakage prevention measures have been implemented at approximately 500 discharge points in total to prevent odor leakage



Blind plates and plugs are installed at discharge points that are operated less frequently (left). Double valves are installed at discharge points that are frequently operated (right)

# Developing Talented and Engaging Human Resources

Utilizing and contributing to development of talented and engaging human resources

## Subject 01 Developing Engaging Work Environment



To create a work environment where everyone can play an active role with satisfaction, the Polyplastics Group has set "enhancing employee engagement" as one of the CSR priority areas and the measures in the Mid-Term Business Plan. Based on the results of our regular engagement surveys, we grasped the organization culture of local Group companies in each country and region as well as the opinions of employees and are developing measures at each company accordingly.

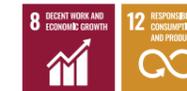
### "Supply Chain Channel" for Positive In-Division Communication

The Group's supply chain consists of more than 200 employees across all its plants and sales companies around the world. Overall regular communication (e.g. monthly meetings) and individual communication between the persons in charge have been taken. However, there was not much communication between employees with different responsibilities. In FY2022, Polyplastics started publishing its in-division newsletter, "Supply Chain Channel," to improve employee engagement by creating more opportunities for positive communication with everyone working together as one team. Three employees in the division are in charge of editing. They publish contents that focuses on specialized business knowledge and the feelings of members in the division that cannot be found in Group company magazines. In addition, in order to provide variation in the information provided in "Supply Chain Channel," they interview and write articles on the corporate philosophy and activities of business partners such as warehouse companies, resulting in deeper communication with them. This has also served as an opportunity to explore how we can reduce the PCF together as well as promote responsible mineral procurement, which requires everyone in our supply chain to work together going forward. In the future, they will aim to make the in-division newsletter even easier to read and worth reading while meeting readers' needs. They are also considering holding events such as town-hall meetings as a derivative project from this newsletter. Through these efforts, they are aiming to further strengthen communication throughout the division and increase engagement.



"Supply Chain Channel"

## Subject 02 New Challenges for the Job Support Team



In the Job Support Team, which is made up of our employees with disabilities, a diverse range of duties are assigned based on each employee's aptitude. In FY2022, the team started a new initiative in which they make recycled candles from discarded candles from local temples and transform them into new scented candles. The candles are donated by temples throughout Shizuoka Prefecture, where the Polyplastics Fuji Plant is located. They crush the candle, melt it, color it, flavor it and harden it to make a new scented candle. This entire process is done by five members of the Job Support Team. In the first year of the project, 20 prototypes were created from approximately 10 kilograms of candles, and samples were given to employees to help them relax the bodies and minds. Going forward, after getting feedback from employees who have used prototypes, they are planning to expand the project by donating the candles to local ceremony halls and handing them out as souvenirs to participants in corporate briefings and plant tours. In the future, they are also planning to sell the candles at bazaars and flea markets, and then donate the proceeds to charity.



## Subject 03 "White 500" for the First Time



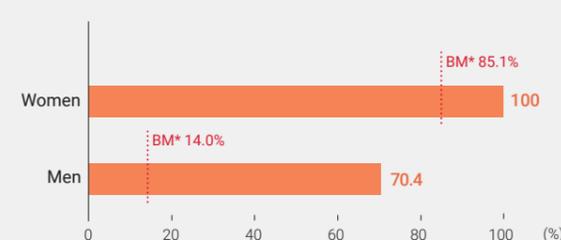
We believe that employees who are healthy and energetic are more likely to be fulfilled in their personal lives and contribute to the continuous development of the company. Thus, we have been working on health management by implementing various measures promoting health. Based on the Daicel Declaration on Health Management, the healthcare team at Polyplastics, consisting of our HR department, public health nurses, and occupational physicians, centrally supports employee health management through medical checkups and guidance, as well as through stress checks that help us understand and reduce employee stress levels. Furthermore, we have established a collaborative system between Polyplastics' public health nurses and Daicel's team of public health nurses to share information and solve issues, as well as to provide ongoing awareness such as "Public Health Nurse News," published regularly. In March 2023, these efforts were recognized and Daicel Corporation and Polyplastics were certified as a "Health and Productivity Management Organization 2023 (White 500)" by the Ministry of Economy, Trade and Industry and Japan Health Council. This was the first time that we were certified as a "White 500" company.



### DATA

#### Childcare Leave Usage Rate

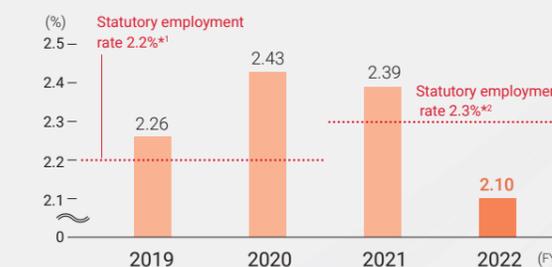
The childcare leave usage rate for employees with children born in FY2021 was 100% for women and 70.4% for men. Although the childcare leave usage rate for male employees decreased by 12.5 points compared to the previous year, going forward we will actively encourage male employees to use childcare leave.



\*Bench Mark (Source: Ministry of Health, Labor and Welfare Basic Survey of Gender Equality in Employment Management in FY2021)

#### Rate of Employees with Disabilities

In FY2022, the rate of employees with disabilities was 2.10%, lower than the previous fiscal year. We will exchange information with local special needs schools and also with organizations that support people with disabilities to expand our recruitment activities more widely and actively recruit people with both physical and intellectual disabilities.



\*1 from April FY2018 \*2 from March 2021

# Social Contribution Activities

Providing opportunities to make society better as a corporate citizen

Subject  
01

## “Working Together Worldwide as a Group for a Better Society”

At Polyplastics, we carry out various social contribution activities as a group every year.

### Three Pillars of Social Contribution Activities

Contributing to local prosperity

Cultivating the next generation

Supporting employee-led social contribution activities

## Contributing to local prosperity

### Nantong, Shanghai

#### Participated in volunteer activities related to COVID-19

Amid the COVID-19 situation, employees from our companies in Nantong (China) and Shanghai (China) participated as volunteer PCR testing staff in nearby areas. Some employees in Shanghai delivered daily necessities to local residents during the lockdowns while others volunteered with elderly people living alone, helping them purchase necessities through their smartphones.



### Kaohsiung

#### Participated in the Kaohsiung Charity Marathon

21 employees participated in the Kaohsiung charity marathon, completing the running courses to promote health and the Company's relationship with the community. Participation fees are donated to a welfare organization through the charity marathon's organizer.



### Raunheim

#### Supporting local beekeepers



In Raunheim (Germany), employees sponsor a local beekeeper group that protects the bees in the area near the office, supporting its activities. In thanks, beekeepers give freshly harvested honey to the Raunheim employees and their families.



### Fuji

#### “Autumn Clean Operation”



In the Fuji area (Japan), employees participate in the “Autumn Clean Operation” every year, which includes cleanup activities on river embankments, beaches, etc., organized by locals living near the plant.

In FY2022, in addition to 40 employees and their families, the members of the SHIZUOKA BlueRevs rugby team, our partner, volunteered to pick up empty cans, bottles, PET bottles, scrap iron, plastic trash, etc., on embankments and beaches.



## Cultivating the next generation

### Bangkok

#### Donated handmade flashcards



In Bangkok (Thailand), employees handmade 960 flash cards (educational materials for young children) with colorful illustrations. The completed flashcards were delivered to children attending nursery school in Nong Khai province in northeastern Thailand.



### Mumbai

#### Lecture on engineering plastics for EV applications to university students



In Mumbai (India), an employee gave a lecture to a group of 30 students in the engineering department on the newest applications for electric vehicles, introducing industry-wide trends and their relevance to engineering plastics. The students were enthusiastic and had many questions and comments about the future prospects of our products.

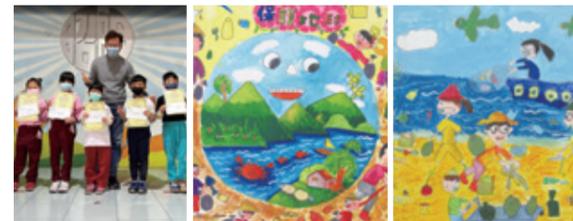


### Kaohsiung

#### Hosted an art competition with an environmental theme



In Kaohsiung, employees held an art contest themed on the global environment for students at an elementary school as well as children of employees living near the plant. A total of 37 entries were received and the winners were awarded scholarships.



### Kuantan

#### Donated hydroponics equipment to a children's home



In Kuantan (Malaysia), employees donated hydroponics equipment made from recycled materials to 20 children living in a children's home. Also, employees explained how to use the equipment to the children and helped them succeed in hydroponic cultivation.



## Supporting employee-led social contribution activities

### Singapore



#### Working with a National Charity for Food Donations

Employees collaborated with the Food Bank Singapore, a charity organization that provides food assistance to nursing homes and children's homes, and they personally delivered 50 bags of assorted groceries to local families in need. Approximately 80% of our Singapore employees participated in these activities.



### Querétaro



#### Donated Approximately 5,400 PET Bottle Caps

In Querétaro (Mexico), every employee participated in the collection of approximately 5,400 PET bottle caps for six months. These caps will be donated to a charitable organization, which will then recycle the caps into furniture and home goods. The proceeds were donated to support children fighting cancer.

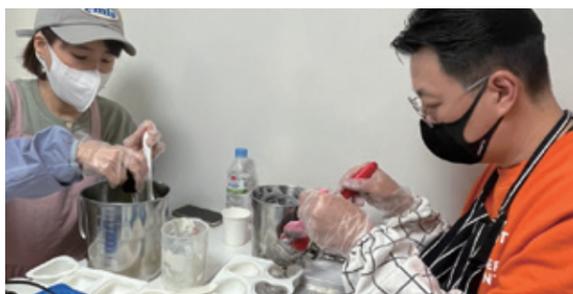


### Seoul



#### Taking on the Challenge of Making Vegan Soap

In Seoul (South Korea), employees participated in a vegan soap making workshop, using only environmentally friendly, plant-based ingredients. Through this experience, employees deepened their understanding of the negative impacts that chemicals found in typical soaps on the market have on the environment. They also used the vegan soap they made.



### Hong Kong



#### Participated in Social Contribution Event to Learn about Fair Trade

In Hong Kong, 12 employees participated in the Fair Trade Coffee Game, a social contribution event held by a non-profit organization. Through lectures and group work, using the example of how coffee progresses from production to sale, they deepened their understanding and knowledge of fair trade.



### Tokyo, Fuji, Nagoya, Osaka



#### "Mottainai\* Initiatives" in 2022

We have carried out "Mottainai Initiatives" for five consecutive years, collecting items that are no longer being used at home and donating them to non-profit organizations. Until now, Polyplastics offices and plants in Tokyo, Fuji, Nagoya, and Osaka handled these initiatives, but starting FY2022, employees from Daicel also joined in, and we were able to collect 2.5 times more items for donation than in the previous fiscal year.



\* Mottainai means "What a waste!" in Japanese.

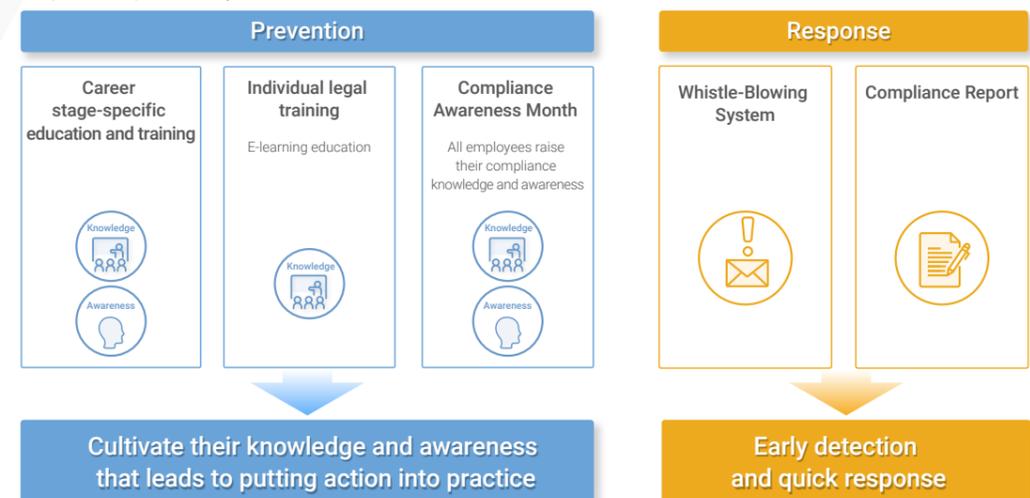
# Compliance

Prioritizing compliance and carry out business in a socially fair and appropriate manner

## Subject 01

### Compliance Operational Structure

Polyplastics implements compliance measures from the two perspectives of "Prevention" and "Response" and strives to ensure an effective compliance operation system.



## Subject 02

### Unique and Original Initiatives by Each Group Company

Every August is Compliance Awareness Month and each Group company undertakes unique activities aimed at enhancing the effectiveness of the entire Group's compliance system. At the Polyplastics Group company in Malaysia, employees put up original posters in such high-traffic spots as the main entrance and those to various departments, looking to communicate the importance of compliance to employees in a more accessible way. At the Group company in Taiwan, the managing director issued a message to employees on the importance of compliance and the company also conducted a compliance slogan contest and publicly awarded the top three entries. In addition to these, very unique efforts are being made by each company, such as compliance crosswords and compliance four-panel comic contests.

