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Supporting global manufacturing with engineering plastic

Polyplastics is Japan’s first specialized manufacturer of engineering plastic. Engineering plastic is made from functional resins having 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. The Polyplastics Group has a network of 32 operations sites spread across 13 countries and regions through which we provide engineering plastic and technical support to customers worldwide.

Number of Employees
2,239

R&D/Technical Solution Center
6 sites

Production
7 plants

Sales
19 offices

Consolidated Net Sales
169.8 billion yen

Consolidated Operating Income
21.5 billion yen

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Topics
Polybutylene Terephthalate
DURANEX® PBT
Superior electrical properties and reliability for electronic devices and components

Polyphenylene Sulfide
DURAFIDE® PPS
A linear polymer that is extremely tough and shock resistant

Liquid Crystal Polymer
LAPEROS® LCP
“Super Engineering Plastic” with thin-wall flowability that changes what we know about engineering plastic

Cyclic Olefin Copolymer
TOPAS® COC
Superior transparency and safety suited to healthcare and food packaging applications

Polyethylene Terephthalate
RENAATUS® PET
High heat resistance and superior electrical properties rivaling those of thermosetting resins

Long Fiber Reinforced Thermoplastic
PLASTRON® LFT
Combining rigidity and high impact strength to expand the scope of resinification
Shaping a Sustainable Society with Our Plastics

As mentioned in the Corporate Philosophy, our Corporate Social Responsibility (CSR) is contributing to shaping an abundant future for society through our engineering plastic business.

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.

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 our customers with the excellent solutions for engineering plastics, in technology, quality, services, supply, and all other aspects.

VALUE

1. "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. "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.

CSR Activities

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

Business Activities

Contribute to shaping of an abundant society through engineering plastic solutions

Harmony with Environment

Reduce environmental impact and carry out business operations in harmony with environment

Develop Talented and Engaging Human Resources

Utilize and contribute to development of talented and engaging human resources

Compliance

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

Social Contribution Activities

Providing opportunities for social improvement

- Contributing to the prosperity of local areas
- Cultivating the next generation
- Supporting employee-led social contribution activities
Towards a more sustainable society
Strengthening production systems focused on environmental impact reduction

FY2021 was another year of significant change in the business landscape for Polyplastics. As for social changes, many countries have set specific numerical targets, especially in terms of the environment, and consensus has been formed on the introduction of sustainable energy and recycling-oriented economies, the electrification of mobility and the introduction of automated driving. With regard to the changes within Polyplastics, we have promoted innovations in remote communication, utilization of IoT and AI, and also digitalization of cross-departmental operations processes. We welcome these changes and will seek to achieve even greater progress moving forward.

And in order to surmount the challenges in this process and provide solutions, we believe it is essential to make our company more excellent so that all employees can work happily. Our Mid-Term Business Plan was created with this vision.

Additionally, since becoming a wholly-owned subsidiary of Dacel, we have decided to build three new plants. We are aiming to have all of these up and running by FY2024. First, the second COC Plant being constructed in the Saxony-Anhalt in Germany will contribute to the realization of more European style recycling-oriented society. COC is valued for its recyclability and has an important role to play in the promotion of sustainable plastics. Taking the example of PET bottle recycling, we are aiming to introduce a system to improve the recycling quality by changing the shrink label to a COC-derived polyolefin material and separating PET and label by the difference in specific gravity in the cleaning process after collection.

With regard to POM, we are working with China on environmental policy in order to cease operation by 2024 of our Nanjing Plant on the shores of the Yangtze River in Jiangsu Province while building a state-of-the-art plant inland that will allow us to simultaneously expand capacity and reduce environmental load as we adapt to the needs of the Chinese economy. Also, last year at our Kuantan Plant in Malaysia, we launched production of POM which utilizes biomass. POM is able to be made from methanol generated by biomass or from CO2 recovery, which is why it is described as the most sustainability-friendly engineering plastic. And in order to realize this potential, we will continue to expand our production of sustainable POM.

As for LCP, which is used in support of IoT and next-generation communications, we are building a new Polymer Plant at our Kaohsiung Plant in Taiwan. The Kaohsiung Plant already has LCP compound lines, and the new Polymer Plant will allow us to provide both polymers and compound products with a supply chain in Taiwan which is known as a global semiconductor and IT device production hub.

Significantly revising targets to accelerate GHG reduction activities

We have significantly revised our GHG reduction targets through FY2030 in order to clarify the environmental initiatives. Among the shared targets of the Daicel Group, Target (1) aims to have group companies reduce their GHG emissions by 50% by FY2030 (compared with FY2018), while Target (2) is specific to Polyplastics and aims to reduce GHG emissions intensity by 46% by FY2030* (compared with FY2013 and including CO2 produced from raw materials covered by Scope 3).

Target (1) is to respond to social demands. The expectations of the global community and Japan are to halve the GHG emissions of companies by 2030. Although increasing our supply capacity will result in an overall increase in GHG emissions, we will counter this with: 1) energy conversion, 2) process streamlining and 3) the introduction of innovative technologies. Furthermore, by making similar efforts as the entire group, we plan to offset the increase due to Polyplastics capacity expansion and, as a result, reduce the GHG of the Daicel Group by half.

Target (2) is to respond to customer needs. Since the CO2 emitted from the manufacture of engineering plastics is counted in the GHG emissions of customer products, we will reduce product carbon footprint on an intensity basis, including CO2 derived from raw materials. Based on the results of a life cycle assessment for major products conducted in FY2021, we are developing a plan of action in conjunction with raw material suppliers. In addition to the efforts we are making towards Target (1), we believe Target (2) is achievable through the introduction of sustainable materials.

Engineering plastics will be indispensable to the future of society, which is all the more reason for us to set a high bar for ourselves.

Polyplastics are essential materials to the future of society. For example, in the field of mobility, while there is a global consensus about the electrification of transportation and the phasing out of fossil-fuel powered vehicles, no one disputes that automobiles themselves cannot be eliminated, as transportation is an essential need of people. Also, there is a need in all forms of mobility to improve energy efficiency through vehicle lightening while also ensuring safety. The mobility of the future, such as vehicle lightening, introducing sensors to perform area-wide monitoring which enables a high level of safety and the operation of self-driving vehicles, and using communications technology for remote operation of vehicles and mobility devices, will require technological development that makes regular use of engineering plastics. We believe that the future of society cannot be realized without engineering plastics. For this reason, it is essential that our engineering plastics meet the standards of the future. We believe that a significant revision of our environmental targets creates a high hurdle that the engineering plastics essential to the future of society must overcome in order to be accepted by that society. We do not set the bar lower easily; rather, we will clear the hurdles even if they are challenging for us.

Our goal is to be an engineering plastic solution provider that meets customer expectations with capital investment to increase capacity, meets social expectations with environmental processes and technological development, and achieves a balance with profits.
### Highlight 2021

Start of DURACON® bG-POM production utilizing biomass

Offering bG-POM as an option to achieve carbon neutrality

In July 2021, Polyplastics began production of DURACON® bG-POM utilizing biomass. bG-POM contributes to meeting the market’s growing needs for reduced CO2 emissions and fossil fuel usage across the entire product life cycle.

Responding to the growing demand for biomass-derived plastics

In recent years, efforts to reduce atmospheric CO2 emissions have been ramping up worldwide with the aim of achieving carbon neutrality. In this trend, there has been a sharp increase in interest by society in switching over to products that utilize biomass. Compared with chemical products manufactured from exhaustible resources, such as coal, oil and natural gas, biomass produces less atmospheric CO2 emissions across the entire product life cycle and is also not an exhaustible resource.

At Polyplastics, we have had an increasing number of customers demanding plastic materials which contribute to reduced CO2 emissions across the entire product life cycle, and, in order to meet these needs, we have worked to enable customers to lighten and extend the lifespan of their products. In addition, since July 2021, we now offer our DURACON® bG-POM which utilizes biomass (hereafter, “bG-POM”).

Reducing CO2 emissions while achieving the same level of quality as conventional POM

Conventional POM (DURACON® POM) is mainly made from methanol produced by natural gas; however, in line with ISCC Plus certification*, bG-POM is made from methanol produced by biomass raw materials. Using biomass raw materials to produce methanol results in fewer CO2 emissions compared with natural gas, and total CO2 emissions from the production process—from resource extraction to POM production—are up to 60% lower than for conventional POM. The quality of both types of methanol satisfies the same international standards, which means the quality of both types of POM is equivalent. Furthermore, another benefit is that product supply can be sustained into the future by replacing the exhaustible resources like natural gas with biomass raw materials derived from plants that will renew in a matter of decades.

*1 ISCC: International Sustainability & Carbon Certification

ISCC Plus-certified

bG-POM uses a mass balanced method to secure ISCC Plus certification. (refer to figure on the right)

This certification system, which is implemented by inspection bodies affiliated with the ISCC, involves regular traceability inspections across the entire production process—from resource extraction to raw material supply, manufacturing and shipping—and the amount of POM corresponding to the amount of biomass used within a given period in the supply chain is certified by the ISCC as “bio-based POM.” Certification by this widely recognized biomass certification system signifies sustainability across the entire value chain—from the raw material itself to the shipping of the POM.

Realizing a more sustainable society

Biomass-derived bG-POM contributes both to significant CO2 emissions reductions across the entire product production process as well as reduced consumption of fossil fuel resources, which are exhaustible and increasingly depleting resources.

As a company aiming to be an excellent engineering plastics solutions provider, Polyplastics recognizes the importance of developing plastics that will contribute to carbon neutrality and the realization of a circular economy, and this is reflected in the corporate strategy of our Mid-Term Business Plan. Across our entire company, we will continue to focus on increasingly advanced challenges that will contribute to the realization of an abundant future for society.
“Taking productivity to the next level”
Synergy with Daicel to accelerate the Fuji Plant Restructuring Project

New challenges for the Fuji Plant focusing on more advanced production and environmental load reduction

The Fuji Plant Restructuring Project, launched in 2018, has entered a new phase in 2021. By incorporating Polyplastics’ production technology, cultivated over 50 years, with new “Production Innovations by the Daicel Way,” we are achieving more advanced production and realizing revolutionary energy-savings plant-wide.

Incorporating new technology for more advanced production

Polyplastics launched the Fuji Plant Restructuring Project in 2018 in order to find and realize our future vision for our key plant, the Fuji Plant, and this project has been conducted in four phases focusing on upgrading plant production. Phase III, which began in 2021, revolves around bringing together collective wisdom with further technological innovation, and it primarily involves initiatives aimed at stabilizing production, enhancing quality and streamlining operations. Following the acquisition of Polyplastics by Daicel Corporation as a wholly-owned subsidiary in October 2020, “Production Innovations by the Daicel Way” was incorporated in this project as a part of our synergy with Daicel. This has opened up all new perspectives and challenges that have allowed us to make great progress towards more advanced production.

A unique, person-focused approach

“Production Innovations by the Daicel Way” is an approach which was born at Daicel’s Aboshi Plant in the mid-1990s, and it is focused on achieving significant improvement in productivity and on strengthening manufacturing foundations. It is a distinctively “person-focused” approach which views people as the universal starting point when visualizing potential problems at the production site and when developing solutions. Based on this concept, the approach is comprised of four stages: visualization of production challenges, stabilization of production, standardization of operations, and systematization. It has primarily attracted the attention of the manufacturing industry, and the numerous companies which have incorporated it have been able to achieve production innovation. At Daicel’s Aboshi Plant, as well, the innovation achieved has improved its productivity almost three-fold and achieved manpower savings of roughly 60%.

Improving quality and reducing environmental impact via “visualisation”

The key to this production innovation is thorough, person-focused “visualization.” For example, at Polyplastics we have approached only apparent problems when troubles occur, but to solve the problems fundamentally we have had to take a deeper approach because these problems might come from other potential problems, like the operator load. Going forward, we focus on plant-wide visualisation, which includes those potential problems that have not been fully verified. Through this visualization, we eliminate waste and loss, and both new and experienced employees are able to handle the same level of operations; as a result, the precision of each process is improved, which contribute to production stabilization and quality enhancement. This is anticipated to exceed the initial expectations in the Fuji Plant Restructuring Project. Also, eliminating waste and loss at the production site helps to maximize productivity, which makes it possible to reduce raw material and energy usage even further. This project also contributes to cost and energy balance for more optimized operations, as well as significant progress towards carbon neutrality-focused energy savings.

Visualization of potential problems by focusing on persons

“Production Innovations by the Daicel Way” includes person-focused inspections of all operations plant-wide, to the extent of potential items which were not covered by normal inspections. Identifying these operations visualizes the know-how cultivated by employees over many years and provides us with clues for addressing issues (waste and loss) that will lead to greater operational efficiency.

Expanding the successes of the Fuji Plant to plants overseas

The final goal of this project is to introduce the production technology resulting from the efforts to achieve more advanced production at the Fuji Plant to our overseas group plants. Establishing the Fuji Plant as a hub of technological innovation information, we aim to increase productivity and reduce environmental impact for the group as a whole.

Comments from employees

Visualization of potential problems Prevention of problems

Production Div. Chief of Production Planning Dept.
Hidetoshi Kozono (picture at right)
Production Div. Production Center Fuji Plant Dept. Manager of Production Dept.
Raita Nishikawa (picture at left)
Long Cellulose Fiber Reinforced Thermoplastics to Reduce CO₂ Emissions

In October 2021, PLASTRON® LFT business was transferred from Daicel and Daicel Miraizu to Polyplastics. PLASTRON is resin in which reinforcing fibers (glass fibers and carbon fibers) of the same length are incorporated into resin pellets in the same direction. As a material which has both rigidity and high impact strength that are unattainable with conventional fiber-reinforced resins, it helps reduce weight in a broad range of applications, from industrial products such as industrial-use pump housings and fitting parts of civil engineering pipes to various functional parts and structural members of automobiles and motorcycles.

We are also currently developing long cellulose fiber reinforced thermoplastics which are environmentally friendly. This cellulose is a renewable, inedible biomaterial that is at no risk of ever running out. Also, by incorporating this cellulose into resin as a reinforcing material, the CO₂ emissions over the entire life cycle of the product can be reduced. It further contributes to reduced CO₂ emissions thanks to the greater fuel efficiency achieved when it is used to lighten the parts of vehicles. With regard to product quality, as well, many years of study into cellulose materials and research and development utilizing long fiber reinforced thermoplastic resin manufacturing technology has enabled us to produce a product which is markedly stronger than conventional cellulose fiber compound resins. We will continue developing resins which are both functional and environmentally-friendly and offering them to our customers, all for the sake of helping to realize a more sustainable society.

Advantages of long cellulose fiber reinforced thermoplastics

- Able to reduce CO₂ emissions over the entire product life cycle
- Contributed to reduced usage of petroleum-based material
- Because cellulose fiber of stable quality is used, there was no likelihood of gas production during the fabrication process compared with natural fiber reinforced resin, resulting in products of a stable quality

CO₂ emissions are offset by the amount of cellulose fiber absorption

CO₂ emissions reduction over the entire life cycle

Conserving resources and energy by using simulation technology to reduce trial production

At Polyplastics, we use CAE* analysis technology to support product development by our customers. This technology simulates the problems which arise during the product design, mold design and injection molding processes, such as problems with resin flow during injection molding and defects caused when force is applied to the product after molding. As an engineering plastics expert manufacturer, we at Polyplastics have a vast wealth of accumulated CAE analysis-related knowledge and experience which we are able to use to provide extremely precise predictions that can be used as the basis for predicting appropriate lifespans and for developing product designs. This analysis makes it possible to reduce the amount of trial production that would typically need to be performed during development, thus reducing the amount of materials used in making prototypes and molds, as well as the amount of energy used to perform molding. In recent years, we have been developing even more advanced analysis technology and have developed a highly precise method for addressing the extremely difficult task of predicting deformation trends when heat is reapplied (reflow process)

Facilitating widespread adoption of renewable energy through development of new materials for film capacitors

To achieve carbon neutrality, the shift from conventional fossil fuel-derived energy to renewable energy such as solar, wind, and geothermal power, and biomass that is clean and does not increase atmospheric CO₂ is attracting attention. This global energy conversion megatrend will require equipment for a new power network of the future. Our group company, TOPAS Advanced Polymers GmbH in Germany, has joined together with Borealis, one of the world’s leading manufacturers of polypropylene (PP), to develop a new, ethylene-propylene-norbornene (EPN) material suited for use as a film capacitor dielectric in power network equipment. PP resin, which is frequently used as a dielectric for conventional capacitors, is inexpensive, but its durability temperature remains at a max. 105°C, while EPN achieves high heat resistance up to 140°C while being inexpensive. Capacitors can be used at higher temperatures, reducing the space required to suppress the effects of heat generated inside switching components used throughout power networks, downsizing the component itself. Therefore, it is possible to reduce the size and construction cost of power transmission and substation equipment, and to reduce the size and improve fuel efficiency of final products such as EVs that use the transmitted electricity. Thus, it is anticipated that this material will contribute to lower costs and greater efficiency across the entire renewable energy power network.

In addition, the increased heat resistance can further reduce the deterioration of the dielectric due to heat, which leads to a longer product life, making it suitable for use in wind power generation equipment installed on the ocean where it is difficult to repair or replace parts. At Polyplastics, we are helping to facilitate widespread adoption of renewable energy through the development of new materials that are more cost-efficient and functional.

Advantages of more heat-resistant film capacitors

- Extended lifespan
- Reduced degradation
- Reduced size reduction
- Increased fuel efficiency
Significant revision of GHG reduction targets
Establishing a subcommittee to meet the strong environmental needs of customers

New targets of GHG reduction for FY2030

- **Daicel Group**
  - Total GHG emissions (Scope 1,2) **50% reduction** (vs. FY2018)

- **Polyplastics Group**
  - PCF-focused GHG emissions intensity **46% reduction** (vs. FY2018)

At Polyplastics, we pursue reduction of the group’s environmental load as a whole in line with the Group Environmental Basic Policy. This year, we revised our GHG reduction targets and established a new "Environmental Strategy Promotion Subcommittee" from the viewpoint of CSR and business competitiveness.

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**Polyplastics Group Environmental Basic Policy**

Under Corporate Philosophy, we actively work on reducing the environmental load in all business activities 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**
   - We not only comply with all environment-related regulations, but also constantly act from a high ethical perspective and with common sense.

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.
   - We also continue to actively address 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**
   - We actively work on protecting the global environment, including the following initiatives.
     - Regular and quantitative grasping of environmental load
     - Reducing CO2 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**
   - We actively communicate and work with our business partners to raise environmental awareness.

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**CSR Promotion System**

- **Corporate Management Meeting**
- **Polyplastics Management Committee**
- **CSR Committee**
- **Administrative Office**
- **New Environmental Strategy Promotion Subcommittee**

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**FY2021 performance and Mid-Term targets**

**CO₂ Emissions Reduction**

In FY2021, the Daicel Group shared electric power with low CO₂ emissions among group companies, which made it possible for the Fuji Plant to significantly reduce its CO₂ emissions. On the other hand, however, we changed the CO₂ emissions factor of electricity and steam to calculate which is used locally at the Nantong Plant in China, as a result, the newly-calculated CO₂ emissions intensity** for the group as a whole was higher than the previous fiscal year.

We are planning large-scale growth investment toward 2030, and CO₂ emissions are expected to increase accordingly, but we will realize through energy conservation through production and technological innovation, as well as energy conversion from fossil fuels. We will reduce emissions to the same level as in 2018 and aim to significantly reduce emission intensity.

We will continue to work towards achieving the GHG reduction targets for the Daicel Group.

**Industrial Waste Reduction**

This fiscal year, due to the impact of the spread of COVID-19, the Kuantan Plant temporarily ceased its slag recovery operations. This resulted in an increase in landfill disposal and incineration without heat recovery to 17.5%, which was above the target of under 17.0%.

As slag recovery has now been resumed, both the rate of landfill disposal and incineration without heat recovery are expected to improve.

We will continue to actively work towards the achievement of zero-emissions for the group.

**Reducing Emissions of Chemical Substances (PRTR Substances)**

With regard to PRTR substances, the scrubber water temperature control system installed in 2018 helped achieve a set level of reduction in PRTR substance emissions. On the other hand; however, due to the increase in production volume of this fiscal year and the trouble of exhaust gas combustion equipment that occurred in the latter half of the year, the emission of PRTR substances at the Fuji Plant increased by 153.0% compared with FY2019.*

In FY2023, we will install PRTR substance emission control combustion equipment** at the major emission sources, which greatly exceeds the emission control capacity of the equipment initially planned to be installed, and achieve the initial target one year later. We also set a new target for FY2024 of 75% reduction in total emissions compared to FY2019 (Fuji Plant).

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**Mid-Term targets**

**CO₂ Emissions Reduction**

By 2030, Daicel Group Total GHG emissions (Scope 1,2)

- **50% reduction** (vs. FY2018)

**Industrial Waste Reduction**

By 2030, Achieve zero-emissions for the group

- **(Rate of landfill disposal and incineration without heat recovery under 1%)**

**Reducing Emissions of Chemical Substances (PRTR Substances)**

By 2024, reduction of

- **50%** (Fuji Plant; vs. FY2019)

- **75%** (Fuji Plant; vs. FY2019)

**VOC**

Establish VOC measurement methods and benchmarks by FY2022

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*1 Release, usage and generation per production volume
*2 Abbreviation of "Pollutant Release and Transfer Register"
*3 Established prospect on equipment recovery
*4 Capable of reducing PRTR substance emissions by up to 95%.
Reduce environmental impact and carry out business operations in harmony with environment

LCP Leuna Carboxylation Plant GmbH, Polyplastics German group company, has newly installed a reverse osmosis membrane purification system in its plant and begun recycling the plant wastewater. The purification process involves desalination, and it is able to recycle up to around 7t of the plant wastewater per hour, resulting in an annual water savings of around 53,000t. Also, by introducing this equipment, the plant is able to cut down on the energy required to prepare hot industrial water, which reduces CO2 emissions by around 50t per year.

In FY2021, Polyplastics Asia Pacific Sdn. Bhd. (PAP), our Malaysian Group company, began recycling the sludge which is emitted in the course of the manufacturing process. In response to the Malaysian government encouraging the recycling of plant waste, PAP has conducted activities since 2020. However, the recycling of sludge, which accounts for the majority of plant waste, has not progressed sufficiently because of local circumstances. However, with the development of a sludge processing process and the help of a partner company, the Kuantan Plant increased its sludge recycling capacity to 10t of sludge per month. As a result, in FY2021, the plant was able to successfully recycle 70.3% of its total waste.

I am an engineer in charge of the Environment, Safety and Health Department at the Kuantan Plant. Zero-emissions is an extremely important mission of the Polyplastics Group, and we are actively working on waste-recycling initiatives. Our recent, main recycling-related initiative is to reuse the wastewater treatment sludge as cement kiln fuel for our partner companies. Additionally, we are working with a local university to research ways to turn recycled sludge into a building material. Through this research, we are also aiming to turn it into other sustainable materials.

Environmentally-friendly logistics

The Fuji Plant is actively working with logistics companies to reduce CO2 emissions generated from products transportation processes. With the sharp rebound in demand after COVID-19, it has been extremely difficult to maintain product supply, and there has been a significant increase in urgent shipments. As a result, specific energy consumption, as an indicator of the energy efficiency of our logistics, was 3.7% higher than FY2020, but we are actively working to shorten overall delivery distances, to utilize backhaul shipping, modal shifts, and other practices that will help reduce our CO2 emissions.

In addition, from this year, we have also begun initiatives to visualize the CO2 emissions volume of product shipments (Scope 3).
Developing Talented and Engaging Human Resources

**Subject 01: Working with Daicel’s diversity promotion project “WellBe”**

In January 2020, the Daicel Group, of which Polyplastics is a part, launched its “WellBe” diversity promotion project. This project seeks to promote diversity and inclusion as a means towards greater employee happiness, which helps to foster one of the group’s Sustainable Management Policies: “Sustainable People.” Project members are comprised of employee volunteers from the Daicel Group who help to propose and communicate ideas for changing employee awareness and behavior.

As part of this, numerous opportunities for employees to interact and learn about various careers were provided, and this has resulted in 90% of group employees, as of July 2021, having an awareness of diversity-related issues. Polyplastics employees also began taking part in the “WellBe” program in April 2021, and there are currently (as of March 2022) two employees who are members. Thanks to this, Polyplastics is able to take part in more diversity-related initiatives than it would be able to arrange on its own, including teambuilding lectures, job satisfaction-focused career training by outside instructors, and childrearing discussion sessions for men. Of these, the teambuilding lectures generated a huge response, with more than 80 employees from Polyplastics alone voluntarily taking part. All of this serves to strengthen initiatives for the group as a whole and to facilitate diversity promotion which cultivates respect for different values and perspectives.

For the future, the whole Daicel Group is considering how this collaboration can be further utilized, finding new opportunities to develop these activities globally in order to pursue greater and more dynamic diversity promotion.

**Subject 02: Great performance in sorting product bag by Job Support Team**

In the Job Support Team, which is made up of Polyplastics’ employees with disabilities, a variety of duties throughout the company are assigned based on each employee’s aptitude. In FY2021, the Job Support Team also performed excellently in sorting used manufacturing base polymer product bags at the Fuji Plant. These product bags have a dual-layer structure, with a polyethylene (PE) bag inside an outer paper bag to keep out moisture, and this structure has prevented them from being able to be recycled, which is why they have previously been disposed of as industrial waste. However, from May 2020, from the perspective of reducing industrial waste and creating a place for the Job Support Team to play an active role, about 10,700 used product bags (around 2 tons) from the Polymer Group have been separated by the Job Support Team into paper and PE for recycling. The success of this initiative gained attention in-house, and, in FY2021, the Compound Group began sending their used bags (around 28,800 bags/month (around 5.7t)) to the Job Support Team as well. In order to accommodate this major increase in volume, a cutting machine was installed to cut through the spots where the PE and paper bags are glued together (machine is operated by our group company, Polypla Service Co., Ltd.).

The childcare leave usage rate among female employees was 100% and 82.9% among men. In FY2020, the childcare leave usage rate among female employees was 153% and 131% among men.

**Great performance in sorting product bag by Job Support Team**

**Childcare Leave Usage Rate**

In FY2020, the childcare leave usage rate among female employees was 153% and 131% among men. The childcare leave usage rate among men increased 13.1% over the previous fiscal year.

**Rate of Employees with Disabilities**

Although we strive to provide a work environment where employees with disabilities can work comfortably, Polyplastics’ employment rate for persons with disabilities declined 2.2% compared with the previous fiscal year. However, we will continue to actively pursue hiring activities, including expanding our regional scope for special needs education schools for persons with disabilities.

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**Create an employee-friendly workplace**

**“Kurumin Certification” obtained for the third time in a row**

Polyplastics has obtained “Kurumin Certification” from the Ministry of Health, Labour and Welfare’s Tokyo Labor Bureau as a company which supports employees in their childrearing efforts. This is the third time in a row that we have received this certification, with the previous two times being in 2017 and 2019, respectively.

**Childrearing discussion sessions for men**

Career training sessions, opportunities for employees of different positions, genders and ages to think together about their careers.

Teambuilding lectures, opportunities to foster an awareness and culture of mutual praise-giving among employees.

Childrearing discussion sessions for men, opportunities for male employees in group companies to talk together about the joys and struggles of childrearing.
Since 2019, the Shanghai (China) office has participated in the CSR assessment contest held by the Commerce Committee of Pudong New Area, under the concept of “considering safety, health, the environment and employee wellbeing important”. This year, the Shanghai office was awarded the CSR AWARD for its business improvements in line with the 83 indicators set by the Commerce Committee, such as labor unions, personnel, safety, environmental protection, sales, etc.

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

### Contributing to the prosperity of local areas

- **Shanghai**
  - **CSR AWARD from local government for business improvements**
  
  Since 2019, the Shanghai (China) office has participated in the CSR assessment contest held by the Commerce Committee of Pudong New Area, under the concept of “considering safety, health, the environment and employee wellbeing important”. This year, the Shanghai office was awarded the CSR AWARD for its business improvements in line with the 83 indicators set by the Commerce Committee, such as labor unions, personnel, safety, environmental protection, sales, etc.

- **Farmington Hills**
  - **Assisting with local river water quality surveys**
  
  In Farmington Hills (USA), there was concern that the chemicals used to remove snow buildup in winter would flow into the river and negatively affect the water quality. In response to these concerns, local employees took part in river water quality surveys carried out by an NPO engaged in environmental conservation. The surveys were carried out using a specialized kit, and they measured water quality not only around the Farmington Hills office but also in California, Kentucky and Arkansas.

### Cultivating the next generation

- **Hong Kong**
  - **Working with an NGO to reduce food waste**
  
  Employees at the Hong Kong office cooperated with members of the NGO to prepare food and deliver it to those in need.

- **Kuantan**
  - **Donation to medical organization of examination tables for COVID-19**
  
  Employees at the Kuantan (Malaysia) plant donated 60 examination tables to a local medical organization which was experiencing a shortage due to the spread of COVID-19.

### Supporting employee-led volunteer efforts

- **Hong Kong**
  - **Twenty employees take part in blood drive**
  
  Since 2018, employees at the Nantong (China) plant have participated in a blood donation event. In FY2021, 20 employees took part in the event and donated a total of 6,100ml blood.

- **Nantong**
  - **Employees undertake cleanup of plant surroundings**
  
  Since 2016, employees at the Nantong (China) plant have carried out cleanup activities. In FY2021, 74 employees participated in roadside trash cleanup efforts in the vicinity of the plant.

- **Family day event at office**
  
  A workplace experience event was held at the Hong Kong (China) office for children of employees. Nine children took part in the event, where they learned about Polyplastics and how TOPAS® COC is helping to address environmental issues and plastics recycling challenges.

- **Nantong**
  - **Donation to local elementary school**
  
  At the Nantong (China) plant, employees raised 18,000 Chinese yuan (enough to support 60 children) which they donated to a local elementary school in order to support children in need. This is an ongoing initiative of the Nantong Plant, with this most recent donation being the 16th donation since the initiative was begun in 2007.
Prioritize compliance and carry out business in a socially fair and appropriate manner

Cultivating the next generation

Support for a local handball team

Employees at the Oberhausen (Germany) plant donated match uniforms to the children who belong to a local handball team. The new uniforms with Polyplastics Group logo were well received by the children, who were very pleased. Furthermore, some employees are directly supporting the players’ development by being actively involved as team advisors where they can keep an eye on the children’s progress.

Supporting employee-led volunteer efforts

Taipei, Kaohsiung

Donation to Kenya through NGO

Employees in Taipei and Kaohsiung collected a total of nine boxes of shoes, clothing bags and other essential items which they then gave to an NGO which assists people afflicted by parasitic fleas in Kenya, where it is common to walk around barefoot.

“Mottainai initiatives”

In Tokyo, Fuji, Nagoya, and Osaka (Japan), we have carried out the “Mottainai initiatives” for four consecutive years, collecting items that are no longer used at home and donating them to NPOs. Despite the limited variety of items that can be donated due to COVID-19, employees’ awareness has improved more than ever, and more donations have been collected than in the previous year.

Individual action to save the environment

More and more employees are acting on their own individual initiative to help protect the environment.

Action to reduce CO2 emissions in daily life

Employees at the Farmington Hills (USA) and Querétaro (Mexico) offices are putting to use existing applications to visualize their individual, daily CO2 emissions. Furthermore, employees share and implement ideas for how they can work together to reduce CO2.

Holding a 3R photo contest

3R (Reduce, Reuse, Recycle) photo contest was held by employees in Bangkok (Thailand) office. By sharing photos of 3R activities in their daily lives, employees had a good opportunity to think anew about what they can do to reduce waste. (Following is an example of contest entry photos)

“My Bottle” and “My Cup” drinking initiative

A water server was installed in the Osaka (Japan) plant to help reduce the use of disposable bottles and cups. By encouraging employees to fill up using their own bottle or cup, a stronger mindset is cultivated with regard to reducing the use of disposable containers.

TOPICS


130 employees take part in a compliance video contest — Raising awareness about workplace compliance

PTM Engineering Plastics (Nantong) Co., Ltd., our Chinese group company, held a video contest themed compliance-related awareness raising.

For the contest, each department created a roughly three to five minute short film based on their daily operations. 10 entries from 10 departments (encompassing around 130 employees) were received; from the HR departments were entries about accurate information dissemination, from security were entries about plant gate rule compliance, and from manufacturing were entries about standard operating procedures. 10 judges chosen from each of the departments graded the entries, with the top three videos receiving awards and prizes. In addition, all of the video entries (including those not receiving an award) were played for two weeks in the cafeteria.

Promoting the introduction of “three lines of defense” against compliance violation risks

At Polyplastics, we have applied the “three lines of defense” approach, which is widely used in internal control, to compliance. The three lines of defense can be roughly sorted between “Operations departments,” “Administrative departments” and “Internal audit departments,” and each of these performs specific defense functions tailored to their role. We are proceeding with introduction according to a two-year plan begun in FY2020, and in FY2021 we introduced the three line of defense to areas where there is a high risk of serious compliance violations, including unfair competition (cartels), anti-corruption (bribery) and illegal exportation.