Human Chemistry, Human Solutions TEIJIN

Teijin Group's Sustainability Management and Initiatives for Circular Economy

Shuichi Osaki

Teijin Group Corporate Officer

Deputy Chief Social Responsibility Officer (for SDGs promotion)
General Manager of CSR Planning & Promotion Department

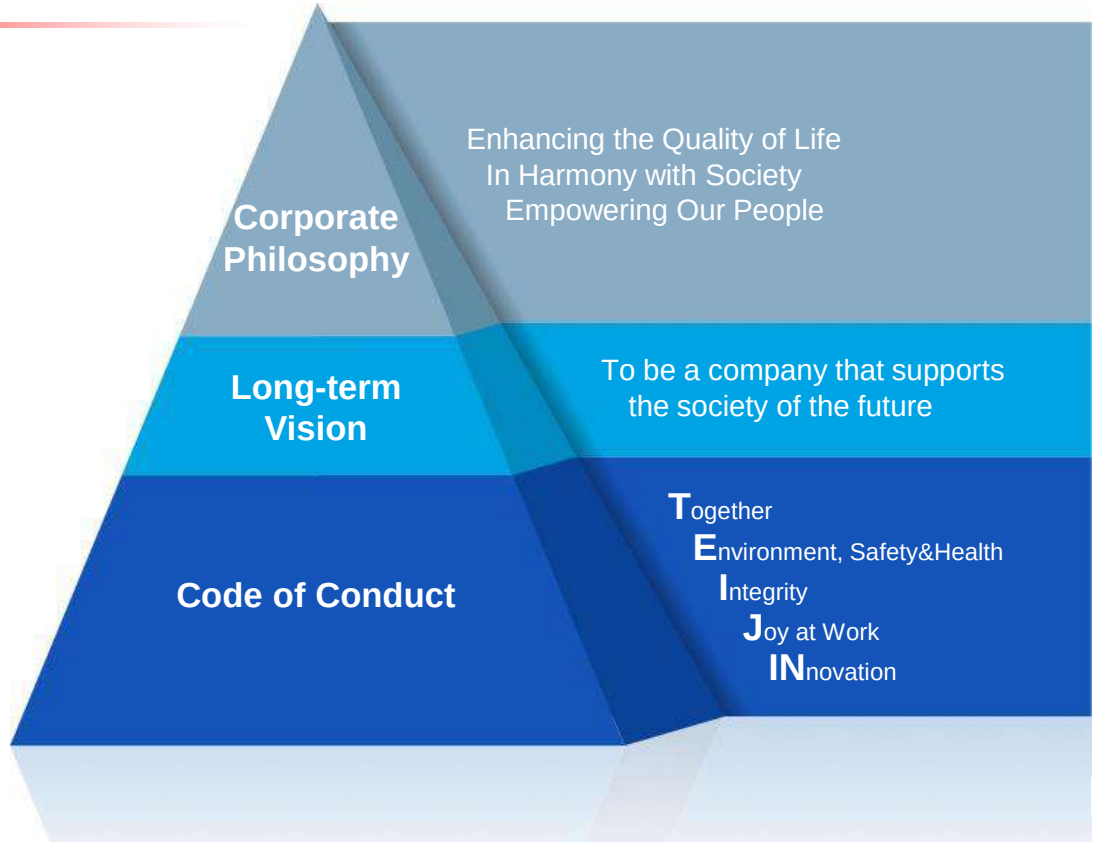
Teijin Ltd.

Our Philosophy

Human Chemistry,
Human Solutions

Brand Statement

A concise expression
of the value and corporate
stance we promise
to our stakeholders



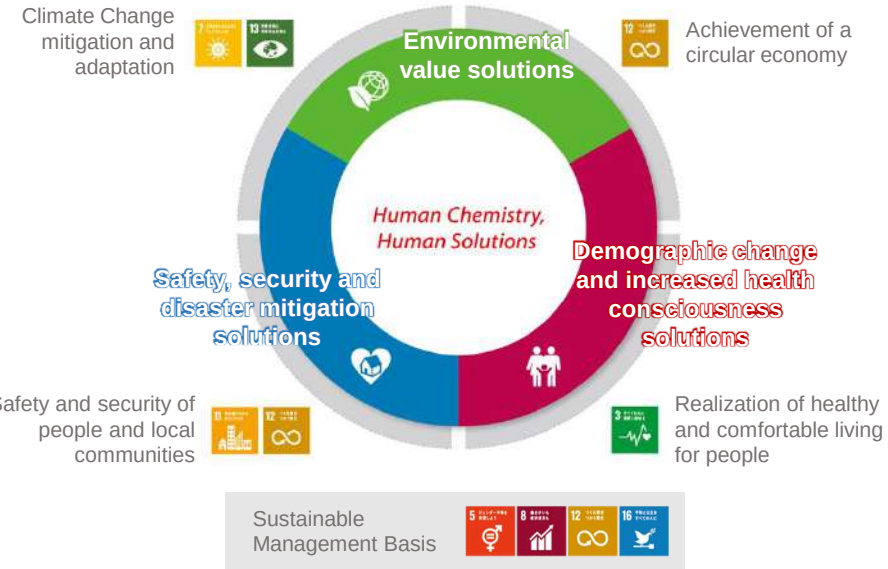
Teijin’s Vision

A sustainable and prosperous society - the ultimate aspiration of the SDGs being implemented. Our vision is to further that aim as a “company that supports the society of future."

We will constantly create value for society's needs through three innovative solutions, supported by our imagination to anticipate changes in society and creativity backed by technological capability.

Policy for initiatives contributing to a Sustainable World

To realize a sustainable world, our focus is on people, delivering innovative solutions to enhance the Quality of Life, while minimizing the negative impacts of our activities on the environment and society.



Long-Term Corporate Vision: Be a Company that Supports the Society of the Future through the Three Solutions

Corporate Philosophy

In Harmony with Society | **Enhancing the Quality of Life** | Empowering Our People

Long-Term Vision

A Company that Supports the Society of the Future

Material Societal Issues

- Climate change mitigation and adaptation
- Achievement of a circular economy
- Safety and security of people and local communities
- Realization of healthy and comfortable living for people

Value Proposition

Contribute to a Sustainable World through the Three Solutions

- **Environmental Value Solutions**
- **Safety, Security and Disaster Mitigation Solutions**
- **Demographic Change and Increased Health Consciousness Solutions**

Material Management Issues

Further strengthening of our sustainable management base

Technological Base, Human Resources, Corporate Governance, CSR, Diversity & Inclusion

Contribute to a Sustainable Society through the Three Solutions

Environmental Value Solutions

Toward a decarbonized society through lightweight mobility

Improve recyclability with thermoplastic materials

Safety, Security and Disaster Mitigation Solutions

Protect human lives with high-performance materials

High-performance materials for safe and secure buildings

Demographic Change and Increased Health Consciousness Solutions

Support community medical care mainly through home healthcare

Promote health through food

Business Domain & Earnings Structure

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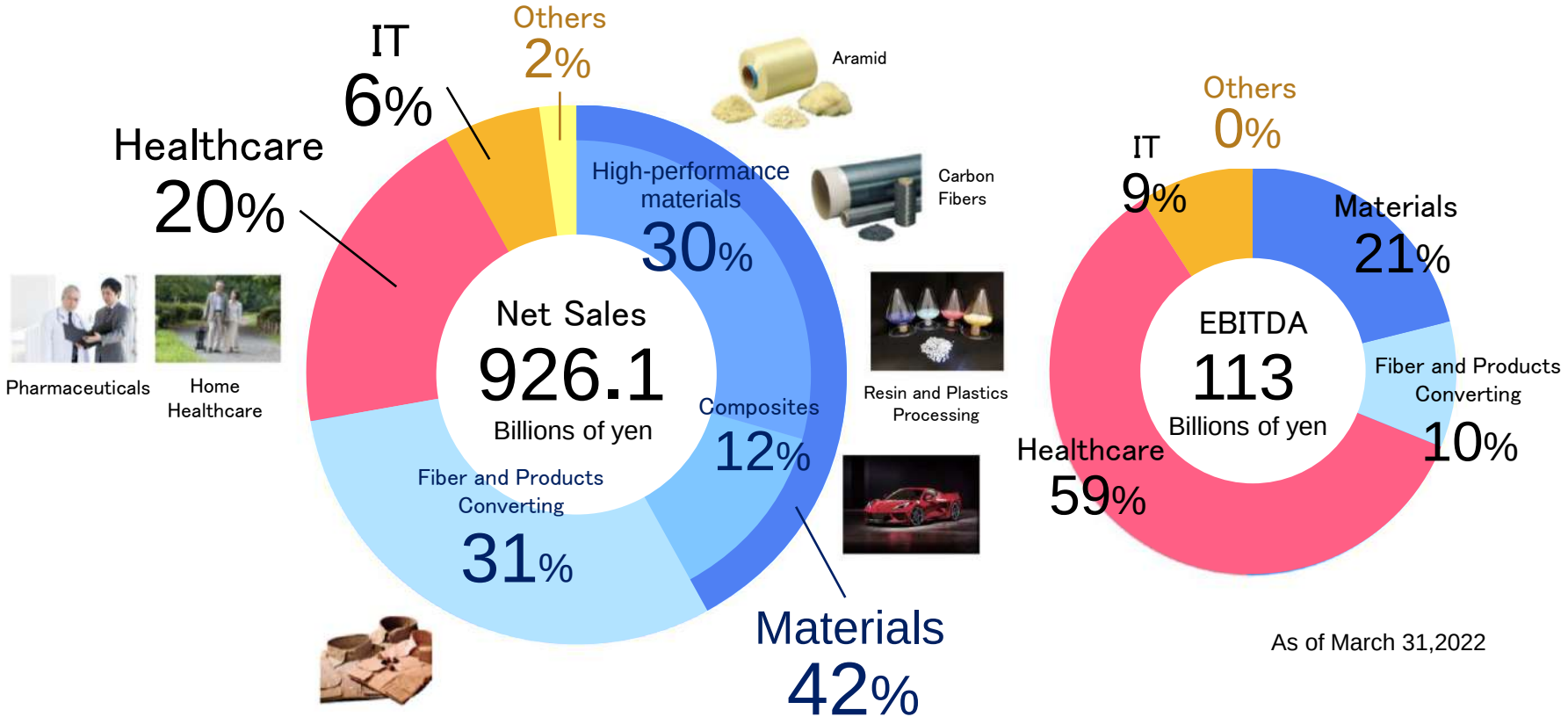


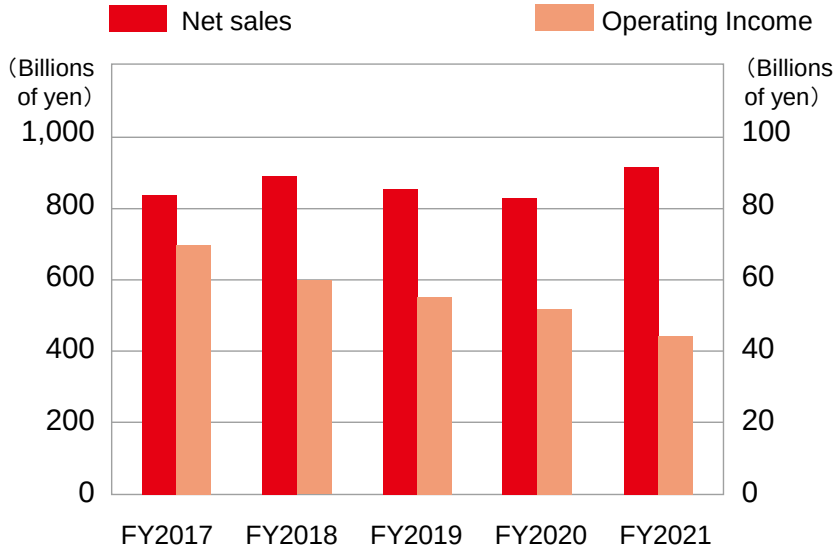
As of March 31,2022

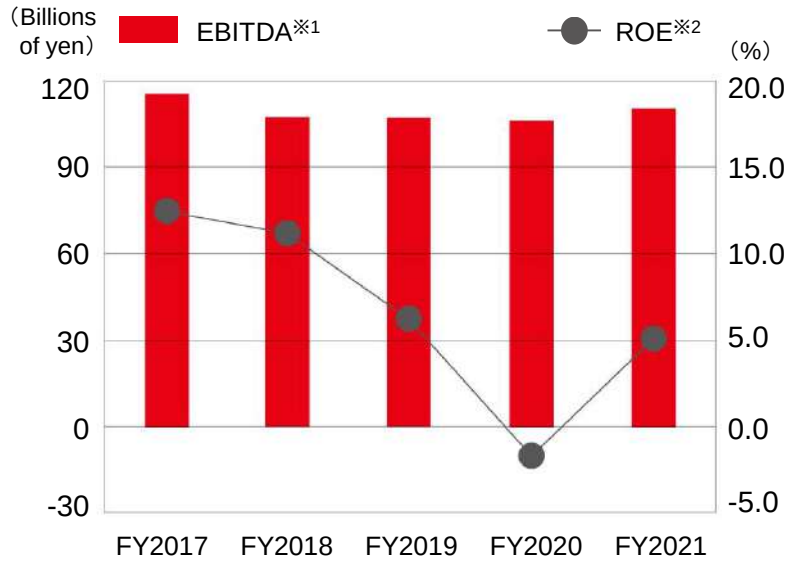
Corporate Data

Human Chemistry, Human Solutions TEIJIN

Company Name **TEIJIN LIMITED**
Established **June 17,1918**

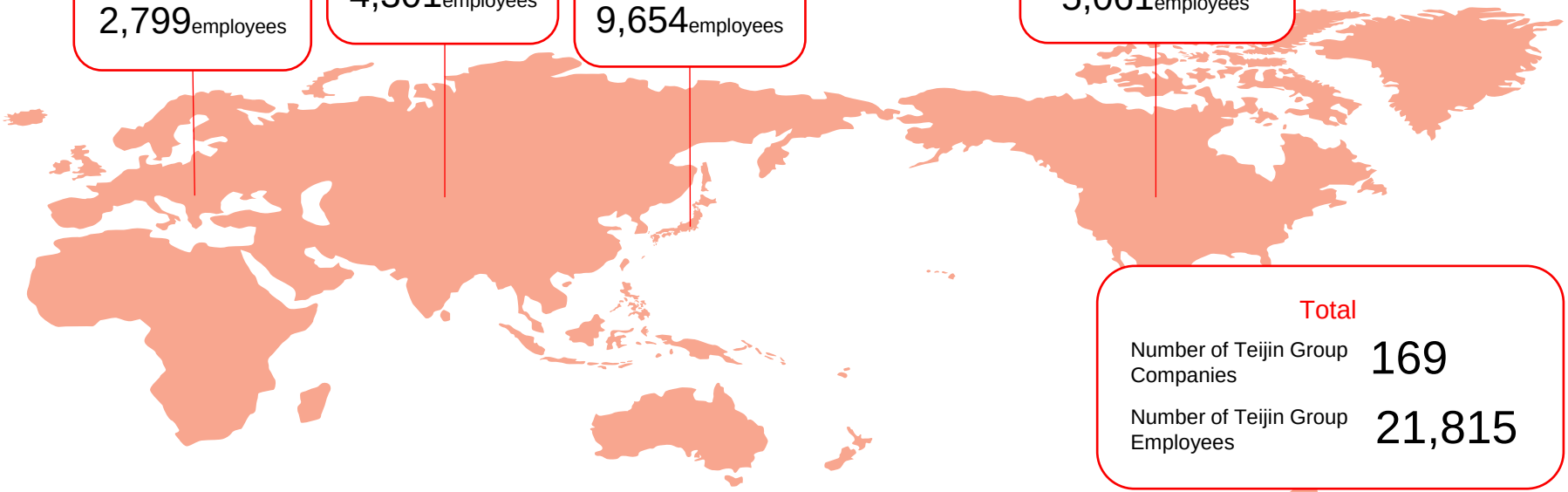
Capital **71,833million yen (as of March 31, 2022)**
Head Office **Tokyo,Osaka**





*1 EBITDA = Operating Income + Depreciation & Amortization *2 ROE = Profit attributable to owners of the parent company/shareholder equity

Global Network



Teijin's History

1918
Establishment of Teikoku Jinzo-Kenshi Kaisha, Ltd.
Beginning Japan's first commercial production of rayon fibers

1952
Beginning of trading business

1958
Beginning of polyester fibers, *Tetoron* business

1960
Beginning of polycarbonate resin,*Panlite* business

1962
Company name changes to Teijin Limited

1971
Rayon fibers business is discontinued
Beginning of PET film business
Beginning of meta-aramid fibers, *Teijinconex* business

1973
Beginning of pharmaceuticals business

1982
Beginning of Japan's first home oxygen therapy (HOT) business

1983
Beginning of IT business

1987
Beginning of para-aramid fibers, *Technora* business

1993
Establish of the Teijin Group Corporate Philosophy

1999
Beginning of carbon fibers, *Tenax* business

2000
Expansion of the para-aramid fibers business by starting *Twaron* business

New corporate brand is introduced including new logo and brand statement

2003
World first in establishing mass production technology for carbon fiber-reinforced thermoplastics (CFRTP)

2011
Entered the functional food Ingredients business

2016
Acquisition of US-based Continental Structural Plastics Holdings Corporation
Expansion of composites business

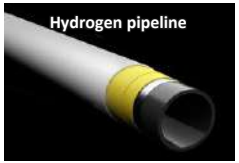
2017
Transfer of Films Business

2018
100th Anniversary

2019

Environmental Initiatives

Contribution to social issues



Environmental Value Solutions

- Development towards building a hydrogen society
- Development of biomaterial technology
- Development of circular economy technology

To realize a complete circulation chain

Target for FY2030

Total emissions < Avoided emissions

In-house emissions	Supply chain emissions
Reduce by 30%	Reduce by 15%

Realize Net Zero Emissions in FY2050

- Climate Change mitigation and adaptation
- Realize circular economy

Freshwater intake volume per sales unit:
Improve by 30%

Landfill waste volume per sales unit:
Improve by 10%

Reduction of Environmental Burden

Eliminate coal-fired power generation

Renewable energy use

Solutions for Climate Change mitigation and adaptation

Environmental Value Solutions	Contribute to the mitigation of climate change by making energy more efficient and cleaner
Safety, Security, and Disaster Mitigation Solutions	Contribute to build a safe and resilient society through the use of high-performance materials or IoT

◆ **Examples of related businesses, products and services**

- Automotive composites, Carbon fiber intermediate materials for aircraft, Hydrogen tanks, Hydrogen pipelines, Battery separators
- High-performance fiber reinforcing material, rainwater storage blocks, cooling / cool-touch materials, thermal insulation related products, etc.

Examples of solutions contributing to mitigation

Carbon fiber-reinforced thermoplastic (CFRTP)

Carbon fiber intermediate materials for aircraft

Highly-transparent heat ray reflection / thermal insulation film

Examples of solutions contributing to adaptation

※Quoted from the Ademwall Association website

Reinforcement materials for civil engineering works

Rainwater storage tanks

Solutions that contribute to the realization of a circular economy

Environmental value solutions

Contribute to building a circular economy by extending product life and promoting the 3Rs

Examples of products and services

- **Long life related: High performance tire reinforcement, conveyor belts, etc.**
- **Recycling: Polyester recycled material "Ecopet", aramid recycled fiber, etc.**

High performance tire reinforcement

Polyester Local Production for Local Consumption Recycling Project

Development of recycling business for discarded fishing nets

Collecting Abandoned Fishing Nets (Collaboration with fisheries cooperatives)

Recycled into plastic products such as tableware and stationery

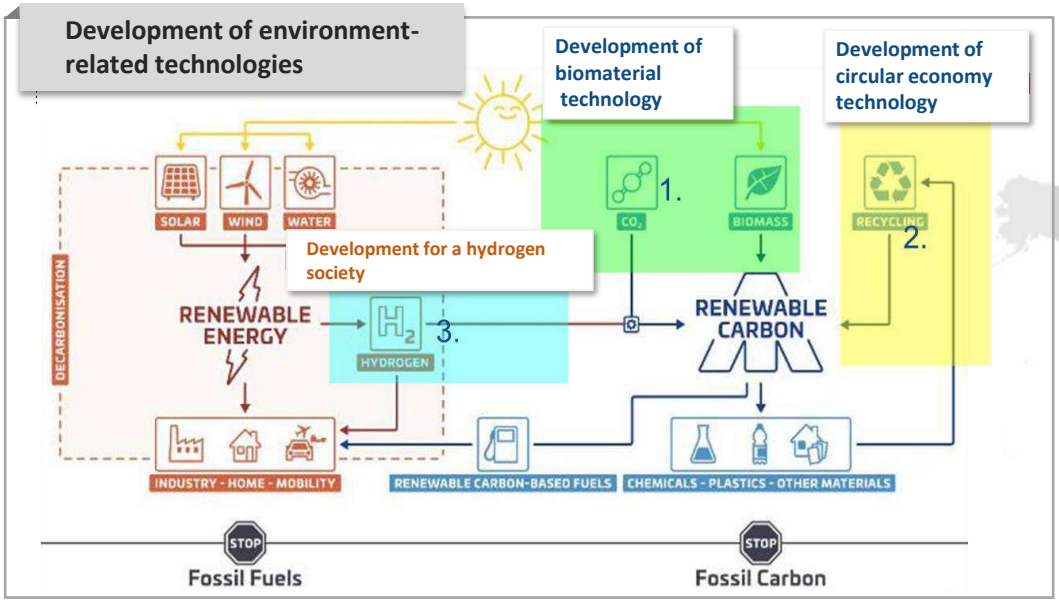
Development of recycling technology for aramid fibers

- End products such as ropes and cables are collected and recycled into pulp for reuse.
- Succeeded in pilot production to regenerate recycled long fibers (announced on November 2021)

aramid pulp

Established the European Sustainable Technology Innovation Center (ESTIC) (January 2021)

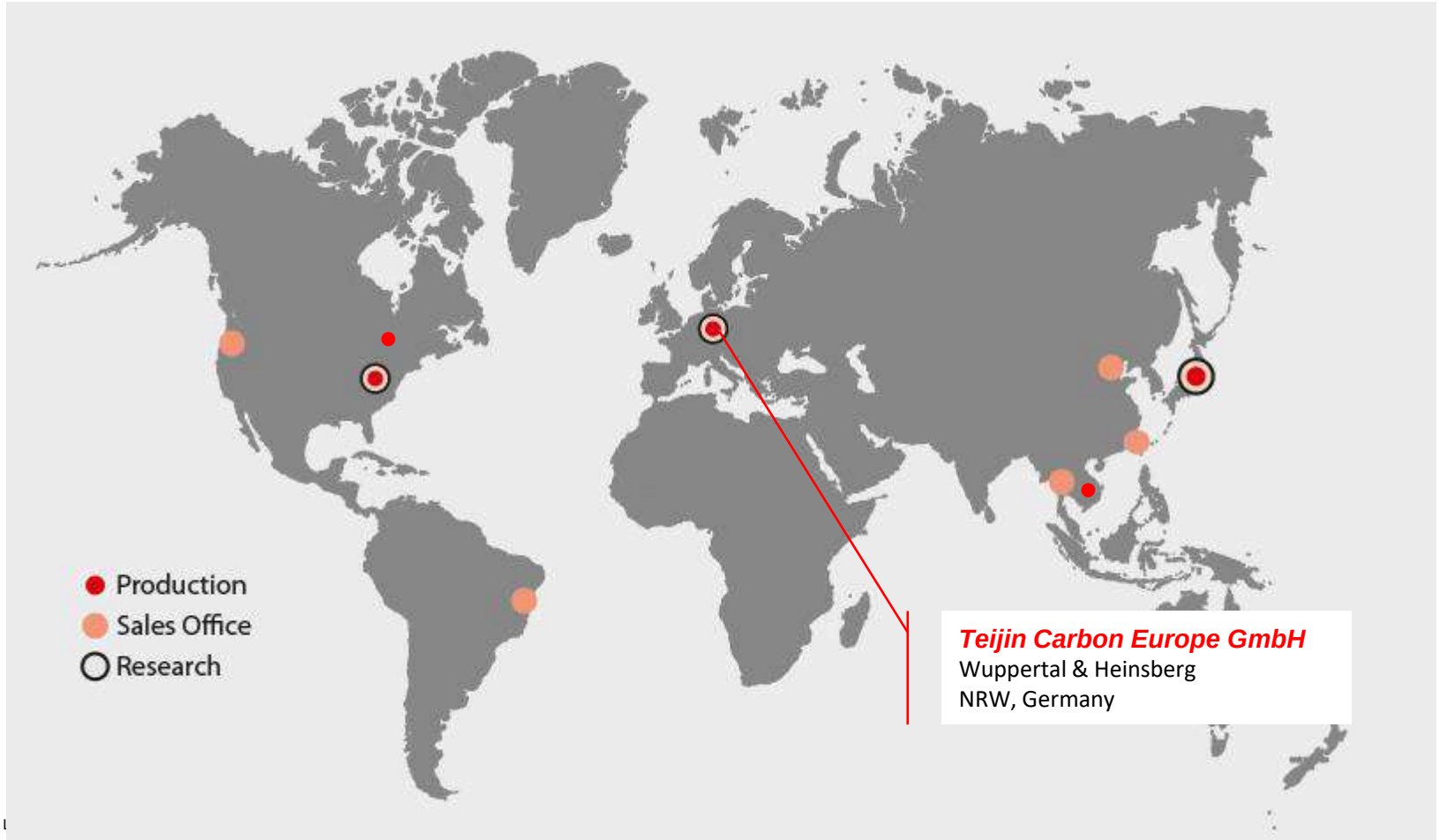
- Established in the Netherlands (Arnhem) as a R&D base for environmental value solutions
- Promote researches for solutions including issues on reducing the environmental impact of each business, in cooperation with European universities, research institutions and companies



ESTIC (Arnhem, the Netherlands)
Key Research and Development Bases of the Teijin Group

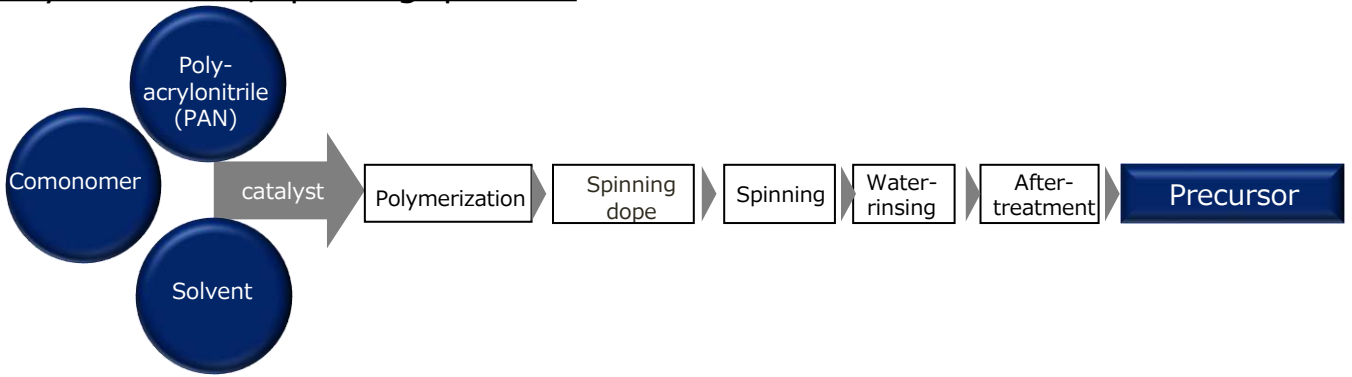
Note) "Renewable Energy and Renewable Carbon for a Sustainable Future - Graphic" *Renewable Carbon Publications* Created by processing (https://renewable-carbon.eu/)

Global Production Sites of Carbon Fibers

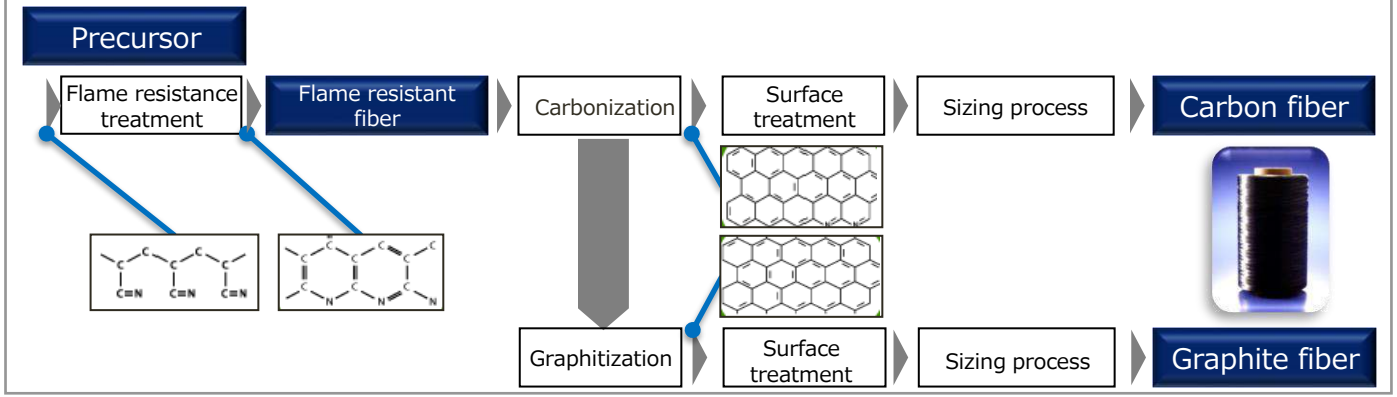


PAN-based carbon fiber production process

Polymerization, spinning process



Carbonization process



Teijin started LCA of carbon fiber by collaboration of Japan and EU

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NEWS RELEASE

Teijin Starts LCA of Carbon Fiber

Tokyo, Japan, December 15, 2021 --- Teijin Limited announced today that it has started to carry out a life-cycle assessment (LCA) of its carbon fibers to calculate their total carbon emissions, an industry first.

Teijin previously calculated the carbon footprint of its carbon fibers used in sports, recreational and industrial applications and more recently its carbon fiber filaments used in aircraft applications, which will make it possible to now calculate emissions for all of its carbon fiber filament applications.

Teijin's LCA methodology has been certified by an independent third-party organization in accordance with the ISO14040 and ISO14044 standards and will provide customers with reliable emission data on Teijin's carbon fiber filaments to help them evaluate their own footprints. Teijin's LCA is useful in identifying carbon hotspots in manufacturing processes and evaluating options for emissions reduction.

Toward commercialization of recycled carbon fiber

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NEWS RELEASE

Teijin to Partner with Fuji Design in Carbon Fiber Recycling

Tokyo, Japan, February 24, 2022 --- Teijin Limited announced today that it has agreed to form a business alliance with Fuji Design Co., Ltd., a Japanese manufacturer of recycled carbon fibers to establish a business structure for the production, supply and commercialization of carbon fiber reinforced plastic (CFRP) products made from recycled carbon fibers using a low environmental impact process.

Fuji Design's proprietary "precision pyrolysis" technology produces high-quality carbon fibers from used CFRP by removing matrix resins. As a green technology, it produces some 90% fewer CO_2 emissions than carbon fibers produced with virgin raw materials. Fuji Design, which is operating a commercial plant partially subsidized by Japan's Ministry of the Environment, has been looking to expand the business by developing new applications for its technology.

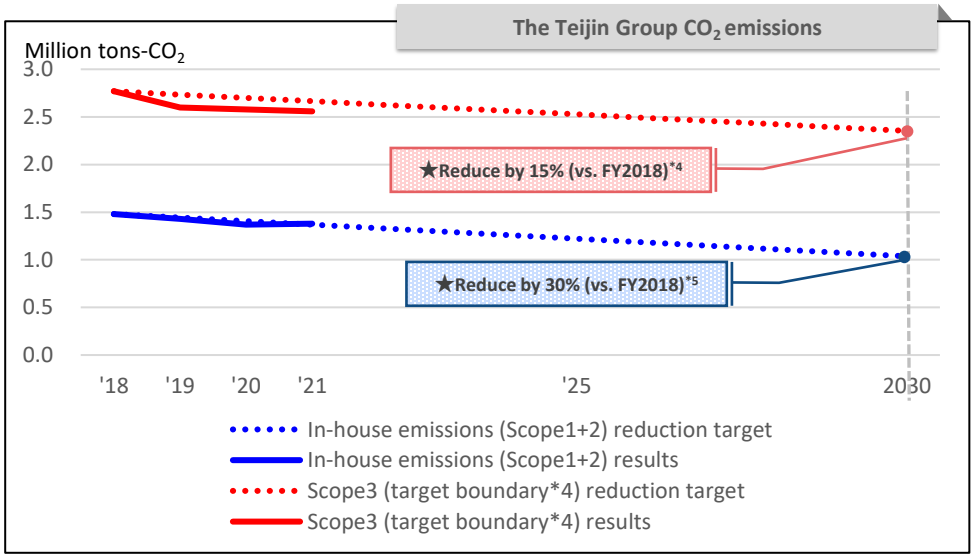
Teijin, meanwhile, has been striving to lower its groupwide environmental impact, including by reducing its fiscal 2018-level CO_2 emissions by 30% as of fiscal 2030 and to net-zero by fiscal 2050. Along with efforts to reduce in-house energy consumption, Teijin also has been developing technologies to recycle materials including carbon fibers.

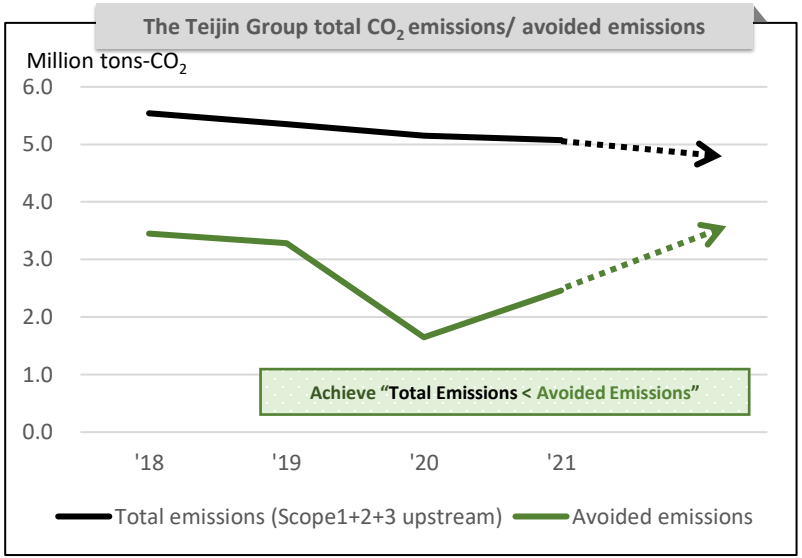
Through the new business alliance, Teijin intends to strengthen its contributions aimed at realizing a more sustainable world. Under a long-term vision of becoming a company that supports the society of the future, Teijin also is working to achieve the United Nation's sustainable development goals (SDGs).

Lightweight and high-strength CFRP, which already is used widely in aircraft, industrial and sports applications, is expected to attract increasing demand as a solution for improving the fuel efficiency of vehicles and other products. The challenge, however, is to urgently establish technologies for the reuse of carbon fibers, thereby helping to eliminate the material's high-impact disposal in landfills or via incineration.

FY2030 Target on Climate Change and FY2021 Results of CO_2 Emissions and Avoided Emissions

- **Emission reduction targets (★) are approved as SBT (Science Based Targets)** *1
- **Reduced both in-house emissions and supply chain emissions beyond the target line,** including the impact of COVID-19
- Due to lower demand of automotive and aircraft application, **avoided emissions significantly decreased during FY2020, while it recovers in FY2021 as the demand recovers**

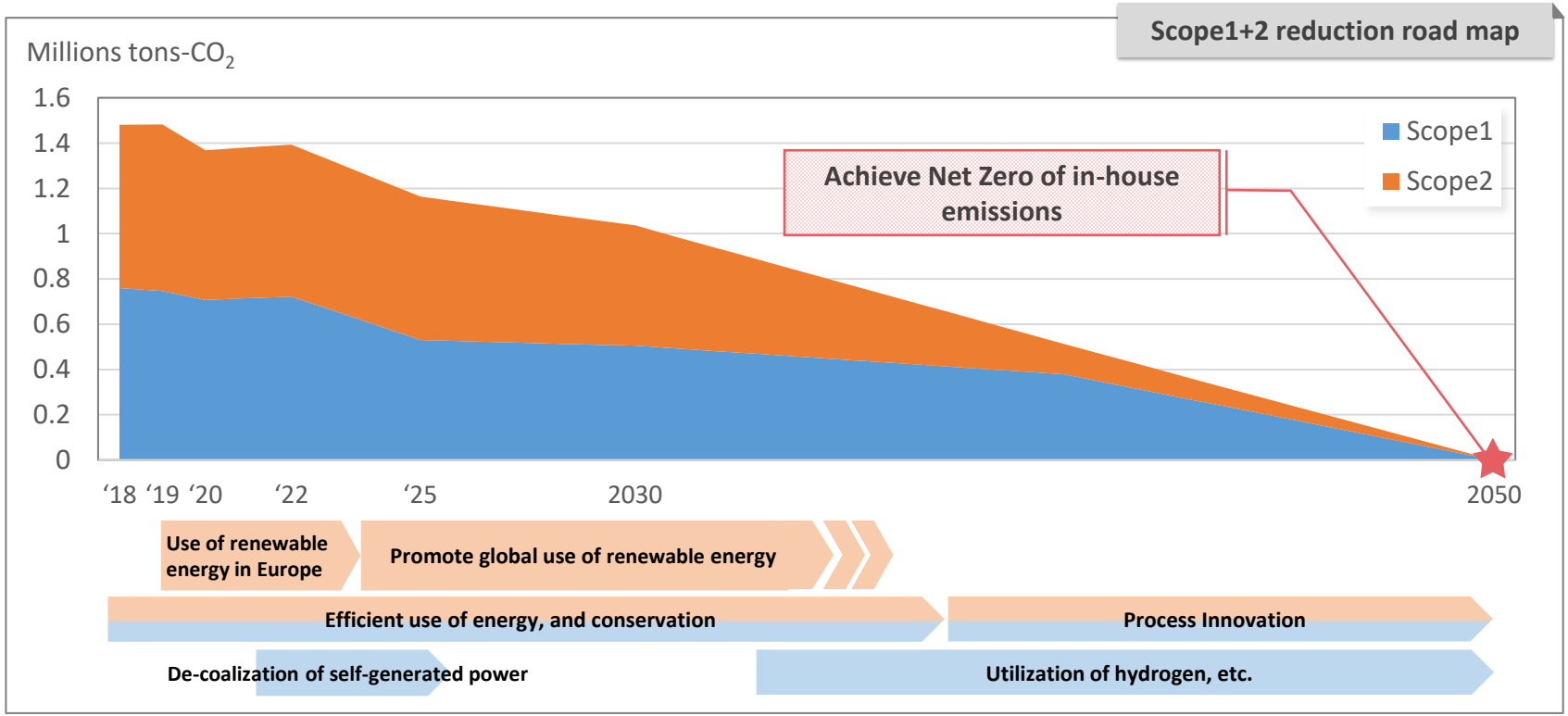




*1 Approved as a "Well-below 2° C (WB2° C)" target (November 2021) *2 Amount of avoided emissions: Calculated as the amount of contribution to the reduction of CO_2 emissions in the downstream supply chain through the use of our products. *3 Total emissions: CO_2 emissions of the Teijin Group and upstream supply chain *4 Among category 1 of Scope 3 (total emissions of purchased products and services), emission volume excluding trading business *5 Revised in July 2021

To Achieve our In-house Emission Reduction Target

- Eliminate coal-fired thermal power by FY2030, and promote efficiency and renewable energy
- Achieve net-zero emissions in FY2050 by promoting the use of hydrogen, etc. after FY2030.



To be a “company that supports the society of the future”