TOWARD ACHIEVING CARBON NEUTRALITY BY 2050

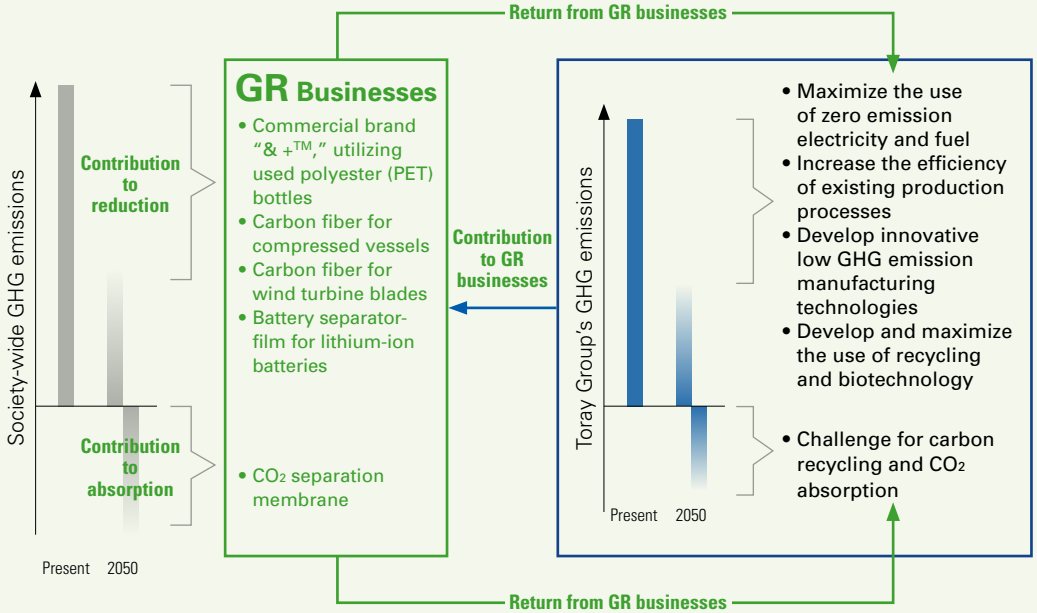
Toray Group is working to expand the Green Innovation (GR) Business, which has been engaged so far in renewable energy, hydrogen, and materials related to electrification, and to develop products that help absorb greenhouse gases (GHGs), such as CO_2 separation membranes, in an effort to make a contribution to reducing GHG emissions throughout society and in achieving carbon neutrality by 2050 for society as a whole. Also, the expansion of these GR businesses will be returned to Toray Group as sustainable energy and raw materials to reduce GHG emissions. In addition, the Group will promote further reduction of GHG emissions through innovative processes and carbon recycling technologies, aiming to become carbon neutral in its business operations in 2050.

Increase the contribution to GHG reduction through GR Businesses

Support the advancement of carbon-neutral technologies in the GR Business, including renewable energy, hydrogen, and materials related to electrification.

Introduction of GHG reduction technologies in business operations

Reduce total emissions through the use of sustainable energy and raw materials, innovative processes, carbon recycling technologies, etc.



Contributing to the realization of a carbon-neutral society

Aiming to become carbon neutral in the company's business operations

TCFD INITIATIVES

Impact Analysis of Climate Change

Upon announcing its support for the TCFD recommendations in May 2019, Toray Group took the opportunity to identify opportunities and risks related to climate change, which are both difficult to predict and uncertain. To determine how the opportunities and risks could impact Toray Group, **a scenario analysis was conducted as per the TCFD recommendations.**

The Paris Agreement target is to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels. Looking to help achieve this target and build a decarbonized society, Toray Group primarily analyzed the 1.5°C increase scenario, but also considered the 2°C increase scenario.

The Group also looked at the 4°C increase scenario assuming insufficient progress on efforts to ameliorate global climate change.

The Toray Group Sustainability Vision outlines the KPIs for fiscal 2030 as interim targets toward the world it envisions for 2050. Accordingly, the scenario analysis covered the period from 2030 to 2050. Toray Group also broadly summarized the impacts of climate change on the Group and conducted analysis emphasizing markets that are thought to have a particularly significant impact on the Group. These markets are synthetic fibers for apparel, electric vehicles, aircraft, wind power generation, lithium-ion batteries, next-generation batteries, fuel cells, and water treatment.

Results of Opportunity Analysis

There are significant opportunities for businesses that mitigate climate change, focusing on GR businesses. There is a possibility that the business opportunities will increase as efforts to address climate change continue to advance. There are also significant business opportunities related to adapting to climate change in segments such as water treatment. While there are significant opportunities in the scenario where efforts to address climate change make insufficient progress (world with a 4°C increase), there are expected to be ample business opportunities in the scenarios where progress is made on efforts to address climate change (world with a 1.5°C or 2°C increase). Furthermore, there are expected to be business opportunities for adapting to climate change in Life Innovation (LI) businesses in segments such as infectious disease protection garments.

Results of Risk Analysis

For the climate change risks, there is a particularly significant risk of carbon tax burdens and restrictions on GHG emissions. The carbon tax burden in the scenario where progress is made on efforts to address climate change was found to be around US$800 million (equivalent to approximately 85 billion yen).* Furthermore, Toray Group is engaged in a wide range of businesses worldwide and there is a possibility that some operating bases will be significantly impacted by water intake restrictions. Therefore, water usage restrictions were determined to be a significant risk.

* Calculated by multiplying the fiscal 2019 GHG emissions (5.75 million tons-CO_2) by the estimated carbon tax (US$140 per ton) under the 1.5°C and 2°C scenarios.

Main opportunities, risks, and responses related to climate change (excerpts*1) *1 Excerpts from Toray Group TCFD Report 2021

Social change	Main risks, opportunities		Responses by Toray Group	Magnitude of opportunity, risk*2 1.5°C	2°C	4°C
Increase in ratio of renewable energy	**Opportunities**	• Growth of renewable energy-related business • Growth of storage battery-related business	• Carbon fiber for wind turbine blades • Battery separator film GR	large		
	Risks	• Increased electricity costs	• Energy conservation initiatives	large		
Establishment and raising of carbon taxes and GHG emissions reduction targets	**Opportunities**	• Growth of energy conservation-related business	• Lightweight materials GR • Insulating and heat shielding products • Functional garments LI	large		
	Risks	• Carbon tax burden, increased procurement costs for fossil-based raw materials and fuels	• Reduce GHG emissions	large		

GR : GR products LI : LI products

*2 The magnitude of the impact was assessed to be large, moderate or small. Where the magnitude of the impact on a given item varies according to the climate scenario, the gradient indicates the particular scenario where the impact is greater.

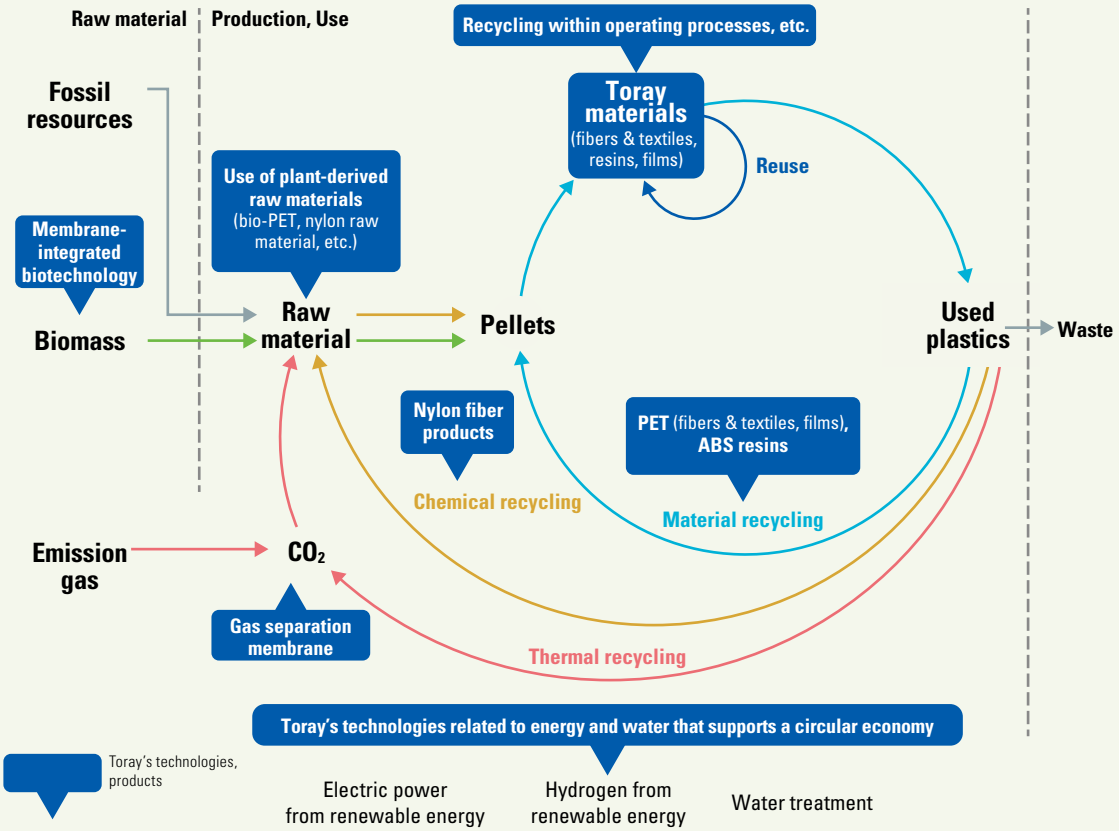
TOWARD REALIZATION OF A CIRCULAR ECONOMY

In addition to recycling of plastic products and using bio-based raw materials, and other carbon recycling technologies, Toray creates technologies designed to reuse water generated during manufacturing processes, technologies that utilize renewable energy and surplus power to enable hydrogen production, and technologies that utilize hydrogen. Development of these and other similar technologies is aimed at helping to achieve a circular economy and to reduce CO_2 emissions as a result.

In terms of recycling, Toray developed and released &+™, a recycled fiber made from used polyester (PET) bottles as a raw material. In addition, we more recently developed a new technology to strip various types of coating materials and resins from the surface of used PET films and a new technology to remove foreign matter during each manufacturing process. Toray released Ecouse™ series of environmentally-friendly PET films made from raw materials recovered and recycled using these technologies. In addition to reducing fossil-based raw materials and waste plastic, this series of environmentally-friendly PET films is expected to decrease CO_2 emissions by up to 50% compared to existing products.

Along with developing materials made from plant-derived raw materials and applying membrane-integrated biotechnology to efficiently produce raw materials from biomass, Toray is also engaged in creating CO_2 recovery technologies using gas separation membranes. Based on an all-carbon material with a two-ply structure consisting of a hollow porous carbon fiber layer and a separation layer, Toray developed a new separation membrane that combines a CO_2 separation function with high durability. We envision this membrane being deployed and put into practical application for natural gas and biogas purification, as well as for hydrogen production and purification, and exhaust gas CO_2 separation.

Contribute to initiatives including biomass plastics, recycling, promoting of enewable energy and the use of hydrogen, and water reuse



TOWARD REALIZATION OF DECARBONIZED HYDROGEN SOCIETY

Hydrogen is considered a clean, next-generation energy that does not emit CO_2 during the usage stage. Toray conducts R&D for various materials and technologies used in each phase of hydrogen production, transport, storage, and use in an effort to help achieve a carbon-free hydrogen society.

For example, carbon paper (CP) and gas diffusion layers (GDL), both products made from Toray carbon fibers, are used in the cell stacks for the fuel cells that function as the heart of fuel cell vehicles. Similarly, high-strength carbon fibers and plastic tank liners that leverage the cutting-edge technologies Toray has accumulated in the aerospace field are incorporated into the high-pressure hydrogen tanks used to store hydrogen.

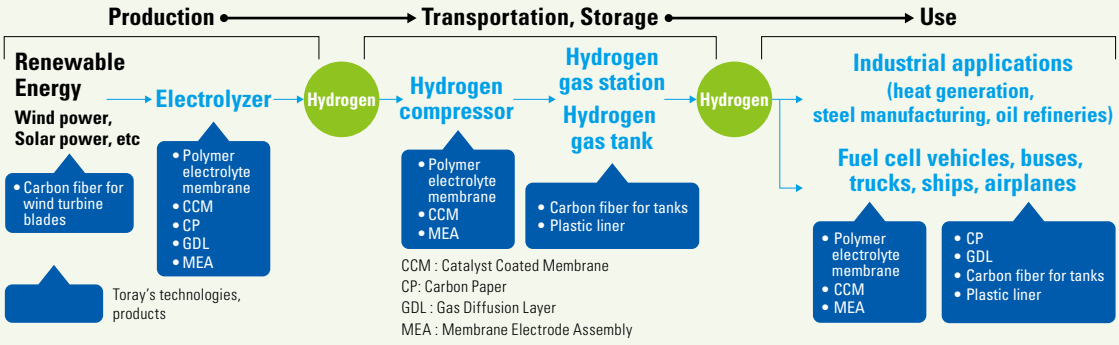
The Group's Germany-based subsidiary Greenerity is engaged in the R&D, production, and sale of the catalyst coated membranes (CCM) and membrane electrode assemblies (MEA) used for fuel cells and water electrolysis. Greenerity is currently the world's largest supplier of CCM. In 2022, a second plant is scheduled to begin operations and will primarily supply CCM and MEA for the fuel cells used in commercial vehicles and passenger cars, as well as for the water electrolyzers required to produce green hydrogen, both of which are expected to see growth in demand throughout the world.

In regard to reducing the costs of green hydrogen as the greatest challenge in achieving a hydrogen society, Toray is collaborating with partner corporations in Japan and abroad to develop and demonstrate a polymer electrolyte membrane (PEM) water electrolysis technology using our proprietary hydrocarbon (HC) type PEM. As part of the "P2G (Power-to-Gas) System Technology Development Project," Toray worked with Hitachi Zosen Corporation to develop Japan's first megawatt class PEM water electrolyzer. This project was commissioned by the New Energy and Industrial Technology Development Organization (NEDO) in partnership with Yamanashi Prefecture and Tokyo Electric Power Company Holdings, Inc., to produce green hydrogen using power from renewable energy. The water electrolyzer that resulted from this project has been demonstrated to produce twice the volume of hydrogen as other technologies using conventional fluorine membranes with the same voltage area. In April 2021, the project began delivering green hydrogen to factories and super markets in Yamanashi Prefecture.

Having been selected as eligible for funding from NEDO under the Green Innovation Funding Project, in September, Toray formed the consortium Yamanashi Hydrogen Energy Society (H2-YES) with Yamanashi Prefecture and Tokyo Electric Power Company Holdings, Inc., and began a project involved in energy demand conversion and usage technology development based on a large-scale P2G system. In order to further expand upon the achievements of green hydrogen demonstrated thus far, the Project is planning to develop and implement a large-scale 16-megawatt class PEM water electrolyzer using Toray's polymer electrolyte membrane, as well as demonstrate the potential to convert heat demand to carbon-free options, over the five-year period from fiscal 2021 to 2025.

At the same time, in September, Toray also entered into a memorandum of understanding regarding the building of a Strategic Partnership with Siemens Energy AG. This partnership is intended to help achieve a carbon neutral society through the creation of hydrogen technologies leveraging innovative PEM water hydrolysis. Going forward, the partnership will provide optimum solutions to customers in countries and regions around the world by leveraging the hydrogen and fuel cell related technologies and businesses owned and operated by both companies, as well as their global networks, in aims of capturing the global market, which is expected to expand dramatically. Likewise, the two companies will jointly advance the introduction and expansion of green hydrogen produced using renewable energy and the deployment of a strategic global business.

Promote R&D of various products for the realization of decarbonized hydrogen society



STATUS OF ENVIRONMENTAL MANAGEMENT INITIATIVES

For detailed environmental data, please refer to the CSR Report on our website. https://www.toray.com/global/sustainability/download/

Promoting Life Cycle Management

In addressing global environmental issues, it is vital to consider the entire life cycle of products and services in order to reduce environmental impact while also delivering improved economic and social value. In this respect, Toray Group practices life cycle management (LCM). LCM is the basis for Green Innovation (GR) products, and the Group has adopted life cycle assessment*1 and the Toray Eco-Efficiency Analysis (T-E2A)*2 tool and is working to establish LCM as a tool to measure CO_2 reduction in the entire life cycle of products and services. Those products that are able to demonstrate objective evidence of providing an effective solution for global environmental issues are certified as GR products, only after the products are subjected to a two-stage screening process by the divisional committees and the group-wide Green Innovation Certification Committee.

*1 Life cycle assessment is a method for quantitatively assessing the resources that have gone into a product and the impact the product will have on the environment and ecosystems over its life cycle.

*2 T-E2A is an environmental analysis tool developed by Toray Industries, Inc. It produces a map of multiple products plotted along the axes of environmental impact and economic performance, enabling users to select the most environmentally-friendly and economical products.

Environmental Accounting

Toray has been practicing environmental accounting since 1999, to track investments and gauge their cost effectiveness. In fiscal 2020, the Company's **environmental facility investment amounted to 1.52 billion yen**, up 0.21 billion yen compared to the previous fiscal year. **Environmental preservation costs totaled 7.56 billion yen**, up 0.43 billion yen compared to the previous fiscal year.

Fifth Medium-Term Environmental Plan

Toray Group implemented its **Fifth Medium-Term Environmental Plan**, which runs from fiscal 2016 to 2020. For the purpose of further reducing its environmental impact, Toray Group raised the following targets under the Toray Group Sustainability Vision in July 2018.

- Toray Group: Achieve a 30% reduction of greenhouse gas emissions per unit of revenue by fiscal 2030, compared with the fiscal 2013 level.
- Toray Industries and plants in Japan: Achieve a 7% reduction in the absolute volume of greenhouse emissions by fiscal 2030, compared with the fiscal 2013 level.

Since fiscal 2020, Toray Group has continued its efforts to reduce greenhouse gas emissions in aims of achieving the targets outlined in the Toray Group Sustainability Vision. In regard to reducing atmospheric VOC emissions and waste recycling, Toray Group is also taking action based on the numeric targets outlined in the CSR Roadmap.

Fifth Medium-Term Environmental Plan Target

Area	Toray Group fiscal 2020 target	Fiscal 2020 results
Curb global warming	Maintain greenhouse gas emissions at least 15% below the fiscal 1990 level (Toray Industries, Inc.)	35.0% reduction
	15% or greater reduction in greenhouse gas emissions per unit of revenue compared to fiscal 1990 (Toray Group in Japan)	29.7% reduction
Management of chemical substances	Atmospheric emissions of PRTR Law-Specified substances: Maintain at least 70% below the fiscal 2000 level (Toray Group)	69.7% reduction
	Atmospheric emissions of volatile organic compounds (VOCs): Maintain at least 70% below the fiscal 2000 level (Toray Group)	73.8% reduction
Waste reduction	Zero emissions goal: Achieve at 45 or more Toray Group plants	Achieved at 48 plants
	Simply disposed waste rate: 22.5% or lower (Toray Group)	20.8%
	Recycling rate: Maintain at 86% or more (Toray Group)	86.2%
	Landfill waste rate: 1.3% or lower (Toray Group in Japan)	2.4%

Greenhouse Gas Emission Reduction Initiatives

Toray has systematically worked to reduce greenhouse gas emissions, with the goal of maintaining greenhouse gas emissions at least 15% lower than the fiscal 1990 level by fiscal 2020. In fiscal 2020, the Company's CO_2 emissions decreased by 188,000 tons-CO_2 year-on-year. **Greenhouse gas emissions were down 10.9% year-on-year at 1.66 million tons-CO_2, which was 35.0% below the fiscal 1990 level**, continuing to meet the target.

Toray and its group companies in Japan are addressing climate change under a goal of reducing emissions by 15% on a per-unit-of-revenue basis by fiscal 2020 compared to the fiscal 1990 level. Greenhouse gas emissions for Toray and its group companies in Japan were down 10.4% in fiscal 2020 compared to the previous fiscal year. Although **greenhouse gas emissions per unit of revenue rose by 3.1 points, emissions declined 29.7% below the baseline year**.

In addition, **greenhouse gas emissions for Toray Group as a whole in fiscal 2020 declined 13.7% to 4.97 million tons-CO_2** due to lower production volumes coinciding with the COVID-19 pandemic and to the achievements of initiatives purposed to reduce greenhouse gas emissions. **On a per-unit-of-revenue basis, the Group achieved a 13.7% reduction compared with fiscal 2013 as the baseline year established in the Sustainability Vision and CSR Roadmap 2022**. Moving forward, despite higher production volumes projected due to business growth, the Group will work to reduce per-unit energy consumption* by 2% annually at all manufacturing companies and plants operated by Toray Group, and will endeavor to reduce greenhouse gas emissions throughout the Group in an effort to achieve the reduction targets for fiscal 2030 as outlined in the Sustainability Vision.

* Energy consumption per converted production volume

Installing Renewable Energy Systems

Toray Group is systematically installing renewable energy systems. The Group installed a solar power generation system at Toray Sakai Weaving & Dyeing (Nantong) Co., Ltd., in fiscal 2019, and at Toray Plastics Precision (Zhongshan) Ltd., in fiscal 2020. Both systems are currently in operation. In addition, Toray Tokai Plant began co-combusting sludge fuel, which is carbon neutral, as boiler fuel from fiscal 2017.

Energy Conservation Measures

Toray is vigorously working on energy conservation activities with the goal of reducing its per-unit energy consumption by 2% annually. In fiscal 2020, the Company's **energy consumption was down 9.3% year-on-year** due mainly to a decrease in production volumes that resulted primarily from the COVID-19 pandemic. Meanwhile, its per-unit energy consumption deteriorated 4.6% as the ratio of fixed energy, which does not contribute to production, increased, due to lower production volumes.

Biodiversity Initiatives

Toray Group views conservation of biodiversity as a critical global environmental issue that is of equal importance to reducing greenhouse gas emissions, as an important theme regarding global environmental problems. As one of its biodiversity conservation initiatives, the Group deploys and applies a set of rules formulated in fiscal 2015 for checking impact on biodiversity to all products. In particular, the Group views palm oil as a raw material that should be followed with priority given the growing amount of interest focused on the risk of its environmental impact. Over the three-year period from fiscal 2020 to 2022, the Group will investigate whether each of its products uses certified raw materials and advance the switch to alternative materials. In fiscal 2020, the Group investigated whether certified raw materials were used in regard to raw materials made from palm oil, and completed its investigation of 93% of relevant suppliers, although some suppliers did not respond. Going forward, the Group will continue to investigate those suppliers who did not respond, and determine the possibility of switching each raw material to a certified raw material, and advance this transition.