

# ENVIRONMENT

Mazda views environmental protection as an urgent issue for humanity, and the highest priority issue facing automakers. The Company is making efforts to reduce environmental impact throughout the entire product life cycle.

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### CSR Targets for FY March 2021

(Self-assessment key ○ : Accomplished, △ : Nearly accomplished, × : Not accomplished)

Items	FY March 2020 targets	FY March 2020 results	Self-assessment	FY March 2021 targets	ISO 26000 core subjects
Energy- and global-warming-related issues					
Promoting resource recycling		(See Mazda Green Plan 2020)			6.5 The environment
Cleaner emissions					
Environmental management					

# BASIC APPROACH ON ENVIRONMENTAL PROTECTION, AND ENVIRONMENTAL PROMOTION FRAMEWORK AND PLAN

## The Mazda Global Environmental Charter

### Environmental Principles

The Mazda Group aims to promote environmental protection and contribute to a better society while maintaining harmony with nature in its business activities worldwide.

- We will contribute to society by creating environmentally friendly technologies and products.
- We will use the Earth's resources and energy sparingly and never overlook environmental considerations when conducting our business.
- We will do our part to improve the environment by working with local communities and society.

### Action Guidelines

#### 1. Creation of Environmentally Sound Technologies and Products

We are committed to the task of creating clean technologies, including methods to achieve cleaner exhaust emissions and reductions in CO<sub>2</sub> emissions, and the development of clean energy vehicles.

We will promote the creation of products that are environmentally friendly from planning and development to manufacturing, use and recycling/disposal.

#### 2. Corporate Activities in Consideration of Conserving Resources and Energy

We will actively promote resource-saving and recycling activities to conserve the Earth's limited resources.

We will strive to diversify energy sources and use them efficiently.

We will promote the appropriate disposal and recycling of end-of-life vehicles.

#### 3. Corporate Activities in Pursuit of a Cleaner Environment

We will comply with environmental laws and regulations, and will also impose voluntary controls for higher standards and implement self-regulated controls.

We will promote the development of new technologies and the introduction of new systems in our pursuit of a cleaner environment.

#### 4. Working with Business Partners to Create a Better Environment

We will actively provide our employees with education and information about environmental protection to enhance their awareness of the global environment.

We will work in close cooperation with each other to achieve better environmental protection.

#### 5. Creating a Better Environment in Cooperation with Local Communities and Society

We will work actively to understand and appreciate society's requirements for the environment and reflect them in our business activities.

We will disclose and publicize environment-related technologies, systems and information. We will not only conduct our own environmental activities, but will also actively participate in social activities for the conservation of the environment.

(Established in 1992; revised in April 2005)

## Mazda's Approach to the Environment

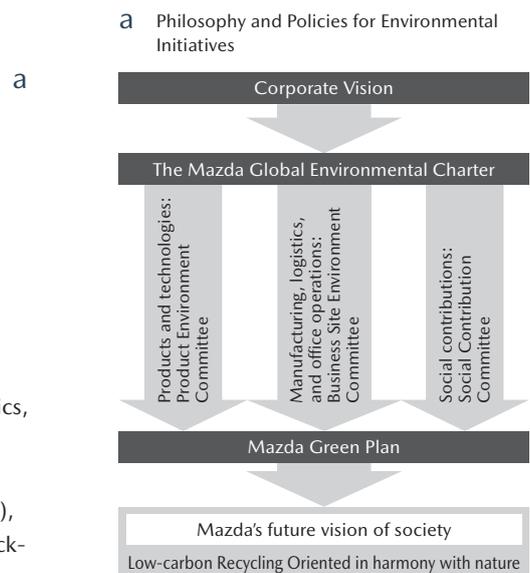
Environmental problems, including global warming, are issues of critical importance for the human race. Mazda actively adopts initiatives to promote a low-carbon, recycling-oriented society in harmony with nature, in cooperation with local governments, industrial organizations, and non-profit organizations. These efforts are reflected in all of Mazda's corporate activities with the aim of achieving a sustainable society.

## Philosophy and Policies

Mazda carries out its corporate activities with the aim of fulfilling its corporate vision (see p.2).

To this end, Mazda established the Mazda Global Environmental Charter as the basic policy for environmental matters in the Mazda Group. The Charter, which states "The Mazda Group aims to promote environmental protection and contributes to a better society while maintaining harmony with nature in its business activities worldwide," along with the five Action Guidelines from the basis of Mazda's approach to the environment. The Company carries out corporate activities related to products and technologies; manufacturing, logistics, and office operations; social contributions, respectively in consideration of the environment.

Specific targets and results are laid out in the Mazda Green Plan (see pp. 54-55), the Company's environmental mid-term plan. By using the PDCA (plan-do-check-act) cycle when executing activities and following up on their results, Mazda can effectively reduce impact on the environment. The Company also strives to address various social issues, including climate change and resource recycling, while placing emphasis on collaboration with external organizations/international initiatives\*1.



\*1 External organizations/international initiatives in which Mazda Participates: - Subcommittees of Japan Automobile Manufacturers Association, working groups of Global Compact Network Japan (GCNJ), Challenge Zero initiative of Keidanren (Japan Business Federation), etc.

## Support and Response to TCFD

In May 2019, Mazda declared its support for the recommendations from the Task Force on Climate-related Financial Disclosures (TCFD)<sup>\*1</sup> and joined the TCFD Consortium<sup>\*2</sup>, showing its commitment to strengthen its efforts to address climate change. Since FY March 2021, the Company has been taking measures for information disclosure regarding climate-related risks and opportunities in accordance with the TCFD recommendations<sup>\*3</sup> in following four thematic areas.

	TCFD recommendations	Related article (page) in Mazda Sustainability Report 2020 [In-Depth Version]
Governance	Disclose the organization's governance around climate-related risks and opportunities.	CSR Promotion Organization (p.24), Mazda Environmental Promotion Framework (p.53)
Strategy	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	Long-Term Vision for Technology Development (pp.8-12), Environmental Promotion Framework (p.53), Mazda's Vision for Society's Relationship with Vehicles in the Future (p.56), Medium- to Long-Term Targets for Business Sites (p.57)
Risk Management	Disclose how the organization identifies, assesses, and manages climate-related risks.	CSR Promotion Organization (p.24)
Metrics and Targets	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	CSR Promotion Organization (p.24), Medium- to Long-Term Targets for Business Sites (p.57), Mazda's Corporate Activities and Impact on the Environment (pp.82-83), The Supplier Evaluation System (p.119)

## Mazda Environmental Promotion Framework

Mazda has established three committees under the CSR Management Strategy Committee, chaired by the president of the Company, to promote environmental management throughout the Group. These are the Product Environment Committee, the Business Site Environment Committee, and the Social Contribution Committee. Each committee sets targets, and monitors results and progress, under the "Mazda Green Plan 2020" mid-term environmental plan.

### b Mazda Environmental Promotion Framework (as of March 31, 2020)



## Mazda Green Plan 2020 Mid-Term Environmental Plan

Based on the "Philosophy and Policies" for environmental initiatives, Mazda developed this mid-term plan toward FY March 2021, centering on the following three main perspectives.

### I. Themes to Be Resolved

Mazda considers the following as issues that both customers and society expect automakers to make positive contributions toward:

- Energy- and Global-Warming-Related Issues**  
Undertaking measures to reduce CO<sub>2</sub> emissions over the entire life cycle of a vehicle.
- Promoting Resource Recycling**  
Reducing waste from vehicles, the vehicle manufacturing and shipping processes, and disposal of end-of-life vehicles, as well as actively promoting the comprehensive recycling of resources.
- Cleaner Emissions**  
Reducing various emissions/waste (aside from CO<sub>2</sub>) from vehicles and manufacturing processes, especially emissions with highly adverse environmental impacts.
- Environmental Management**  
Develop environmental management throughout the entire Group and supply chain.

### II. Mazda's Initiatives (two categories)

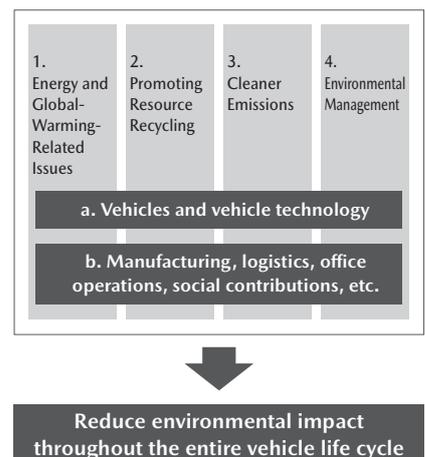
- Vehicles and vehicle technology**  
Contributing to a reduced environmental impact through products and technology.
- Manufacturing, Logistics, Office Operations, Social Contributions, etc.**  
Contributing to a reduced environmental impact through all activities (excluding those related to products and technology)

### III. Consideration of the Entire Vehicle Life Cycle

Mazda is making efforts to reduce environmental impact throughout the entire product life cycle. Around 75% of CO<sub>2</sub> emissions occur over the period from customer use to disposal – an overwhelming percentage of overall emissions (see p. 62).

- Manufacturing and logistics (materials manufacturing, and vehicle manufacturing): accounts for around 25%
- Product use and disposal (use by customer, maintenance, disposal and recycling): accounts for around 75%

### C Approach on the Mazda Green Plan 2020



## Next Medium-and Long-Term Environmental Plan

Mazda is in the process of formulating the next medium-and long-term environmental plan, referencing "Mazda's Vision for Society's Relationship with Vehicles in the Future" (see p. 56), aiming at realizing the vision. With "decarbonization" and "resource recycling" selected as the main themes, discussions are under way to finalize the plan.

\*1 TCFD: Task Force on Climate-related Financial Disclosures  
A private-sector-led organization set up by the Financial Stability Board (FSB), in response to the request from the G20 Finance Ministers and Central Bank Governors.

\*2 The TCFD Consortium is an organization established in Japan, aimed at holding discussions on effective corporate information disclosure and efforts for leading disclosed information to appropriate decision-making on investment by financial institutes and other entities. The Ministry of Economy, Trade and Industry, the Financial Services Agency, and the Ministry of the Environment participate in the consortium as observers.

\*3 Source: <https://tcfcd-consortium.jp/en/about>

**Targets and Actions in the Mazda Green Plan 2020 Mid-Term Environmental Plan** (Self-assessment key ○:Accomplished, △:Nearly accomplished, ×: Not accomplished)

Category	Item	Medium-term targets (Targets and actions by FY March 2021)	FY March 2020		Self-assessment	FY March 2021	
			Targets and actions	Results		Targets and actions	
<b>1. Energy- and Global-Warming-Related Issues</b>							
a. Vehicles and vehicle technology	① Respond to fuel economy standards in each country/region.	Introduce technology to raise fuel economy, to respond fully to the fuel economy standards of each country/region.	•Meet fully the fuel economy/greenhouse gas standards of each country/region.	•Conformed to fuel economy/greenhouse gas emission regulations in Japan, the United States, Europe, and China.	○	•Meet fully the fuel economy/greenhouse gas standards of each country/region.	
	② Improve fuel economy using Skyactiv Technology	Raise the average fuel economy of the Mazda vehicles sold worldwide by 30% by 2015 and by 50% by 2020 compared with 2008 levels.	•Promote Skyactiv Technology steadily toward achieving the fuel economy target for 2020. •Promote development and implementation of technologies based on the Building-Block Strategy.	Promoted Skyactiv Technology steadily, and also promoted development and implementation of technologies based on the Building-Block Strategy.	○	•Promote Skyactiv Technology steadily toward achieving the fuel economy target for 2020. •Promote development and implementation of technologies based on the Building-Block Strategy	
	③ Promote development of next-generation vehicles using biofuels, electrical power, hydrogen, etc.	Promote the development of electric motor drive technologies.  Promote development of technologies supporting alternative fuels such as biofuels, synthetic fuels, and hydrogen.	Promote the introduction of vehicles with Mazda's unique mild-hybrid system.  Promote the development of electric vehicles and plug-in hybrids.  Promote development of technologies supporting biofuels.	Expanded the introduction of Mazda's unique hybrid system, and adopted it in the CX-30.  Promoted development of electric vehicles and plug-in hybrids, and launched the MX-30, Mazda's first mass-production electric vehicle (EV).  Promoted R&D aimed at promoting the spread of next-generation biofuels made from microalgae oil, etc.	○  ○  ○	Promote the introduction of vehicles with Mazda's unique mild-hybrid system.  Promote sales of electric vehicles and development of plug-in hybrids.  Promote development of technologies supporting biofuels.	
	b. Manufacturing, logistics, office operations, social contributions, etc.	④ Reduce CO <sub>2</sub> emissions from factories and offices.*1	Reduce CO <sub>2</sub> emissions from all Mazda Group factories and offices in Japan by 28% or more compared with 1990 levels.	Reduce CO <sub>2</sub> emission intensity from all Mazda Group plants and offices in Japan by 45% compared to 1990 levels.	Reduced CO <sub>2</sub> emissions from all Mazda Group plants and offices in Japan by 52% compared with 1990 levels.	○	Continue efforts to reduce CO <sub>2</sub> emissions from all Mazda Group plants and offices in Japan*2.
		⑤ Reduce CO <sub>2</sub> emissions from logistics.	Reduce CO <sub>2</sub> emissions from all Mazda Group logistics operations in Japan by 50% compared with 1990 levels.	Reduce CO <sub>2</sub> emission intensity from all Mazda Group logistics operations in Japan by 58% compared with 1990 levels.	Reduced CO <sub>2</sub> emissions from all Mazda Group logistics operations in Japan by 59% compared to 1990 levels.	○	Continue efforts to reduce CO <sub>2</sub> emissions from all Mazda Group logistic operations in Japan*2.
	<b>2. Promoting Resource Recycling</b>						
a. Vehicles and vehicle technology	⑥ Promote vehicle recycling.	Develop vehicles that are easy to disassemble and recycle.	Promote development for ease of disassembly and recycling.	For the CX-30, achieved improved disassembly/recycling efficiency and thermal recyclability, carried out appropriate disposal measures, and expanded use of recycled materials.	○	Promote development for ease of disassembly and recycling.	
		Promote the use of bioplastics.	Develop and implement bioplastics, and expand adoption.	For the CX-30, adopted bio-based engineering plastic featuring a high-quality finish without painting, in front grilles and other exterior parts of the CX-30.	○	Develop and implement bioplastics, and expand adoption.	
		Promote bumper-recycling technology.	Promote collection and recycling of damaged bumpers.	Continued to promote collection and recycling of damaged bumpers (collected bumpers: around 57,100), which were reused for undercovers, etc.	○	Promote the collection and recycling of damaged bumpers.	
b. Manufacturing, logistics, office operations, social contributions, etc.	⑦ Reduce waste volumes, promote recycling.	Reduce direct landfill waste to zero*3 across the entire Mazda Group in Japan.	Reduce direct landfill waste across the entire Mazda Group in Japan to zero*3 as compared to total waste volume.	Reduced direct landfill waste across the entire Mazda Group in Japan to zero (0.1%) of total waste volume.	○	Reduce direct landfill waste to zero across the entire Mazda Group in Japan.*3	
	⑧ Reduce packaging volume used.	Reduce volume of packaging and wrapping across the entire Mazda Group in Japan by 45% compared with 1990 levels.	Reduce volume of packing and wrapping in terms of basic units across the Mazda Group in Japan by 56% compared with 1990 levels.	Reduced volume of packaging and wrapping across the entire Mazda Group in Japan by 57% compared with 1990 levels.	○	Continue efforts to reduce volume of packing and wrapping across the Mazda Group in Japan*2.	
	⑨ Reduce volume of water used and promote effective use of water.	•Reduce volume of water used across the entire Mazda Group in Japan. •Reduce volume of tap water used by 47% compared with 1990 levels.	Reduce the volume of water used across the Mazda Group in Japan by 53% compared with 1990 levels.	Reduced volume of water used across the entire Mazda Group in Japan. Reduced volume of tap water used by 55% compared with 1990 levels.	○	Continue efforts to reduce the volume of water used across the Mazda Group in Japan*2.	

\*1 For CO<sub>2</sub> emissions calculations, the CO<sub>2</sub> coefficient based on the standard (Keidanren's Commitment to a Low Carbon Society) of the Keidanren (Japan Business Federation) are used. (For the calculations of FY March 2020 and after, the coefficient of FY March 2019 is used.)

\*2 For FY March 2021, Mazda sets qualitative targets, since unable to maintain continuity by quantitative targets, because of uncertainty over future prospects regarding sales and production due to the COVID-19 pandemic.

\*3 Here "zero" is defined as the condition where the percentage of direct landfill is 0.5% or less of the total volume of waste generated.

\*4 Applicable to consolidated Group companies and equity-method Group companies in Japan.

(Self-assessment key ○:Accomplished, △:Nearly accomplished, ×: Not accomplished)

Category	Item	Medium-term targets (Targets and actions by FY March 2021)	FY March 2020		Self-assessment	FY March 2021
			Targets and actions	Results		Targets and actions

## 3. Cleaner Emissions

a. Vehicles and vehicle technology	⑩ Ensure cleaner vehicle exhaust gas emissions.	Introduce and promote low emission vehicles to improve air quality in each country and region.	Promote the introduction of low emission vehicles that meet the needs of each country and region.	Introduced low-emission vehicles that meet the needs of each country, Japan, the United States, Europe, China, and other regions.	○	Promote the introduction of low emission vehicles that meet the needs of each country and region.
	⑪ Reduce inclusion of substances of environmental burden in products.	Reduce VOCs in vehicle interiors. Promote development and adoption of car air-conditioning systems using new refrigerants with low environmental impact.	Pass Ministry of Health, Labour and Welfare (MHLW) guidelines for the indoor aerial concentration in all new vehicles. Promote development and adoption of car air-conditioning systems using new refrigerants with low environmental impact.	Passed Ministry of Health, Labour and Welfare (MHLW) guidelines for the indoor aerial concentration with the CX-30. Developed a car air-conditioning system using a refrigerant with low environmental impact for adoption in the CX-30.	○ ○	Pass Ministry of Health, Labour and Welfare (MHLW) guidelines for the indoor aerial concentration in all new vehicles. Promote development and adoption of car air-conditioning systems using new refrigerants with low environmental impact.
b. Manufacturing, logistics, office operations, social contributions, etc.	⑫ Reduce waste volumes of PRTR substances.	Reduce waste volumes of PRTR substances across the entire Mazda Group in Japan.	Reduce waste volumes of PRTR substances across the entire Mazda Group in Japan.	Reduced waste volumes of PRTR substances across the entire Mazda Group in Japan by 11% compared with FY March 2019 levels.	○	Reduce waste volumes of PRTR substances across the entire Mazda Group in Japan.
	⑬ Reduce volumes of VOC waste emissions.	Reduce volumes of VOC waste emissions to an average 23 g/m <sup>2</sup> or less across all Mazda lines.	Reduce volumes of VOC waste emissions to an average 20 g/m <sup>2</sup> or less across all Mazda lines.	Reduced volumes of VOC waste emissions to an average 18.6 g/m <sup>2</sup> across all Mazda lines.	○	Continue efforts to reduce volumes of VOC waste emissions at Mazda*.

## 4. Environmental Management

a. Vehicles and vehicle technology	⑭ Promote life cycle assessment (LCA).	Expand the implementation of LCA (in Japan).	<ul style="list-style-type: none"> <li>Steadily implement LCA for new technologies related to environmental performance.</li> <li>To expand use of renewable energy, promote demonstration testing of the combination of renewable energy and reused batteries at business sites.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluated life-cycle CO<sub>2</sub> emissions of internal combustion engine vehicles and electric vehicles, and presented the results in academic papers and at international academic conferences.</li> <li>Promoted demonstration testing of the combination of renewable energy and reused batteries.</li> </ul>	○	<ul style="list-style-type: none"> <li>Steadily implement LCA for new technologies related to environmental performance.</li> <li>To expand use of renewable energy, promote demonstration testing of the combination of renewable energy and reused batteries at business sites.</li> </ul>	
	⑮ Promote an integrated approach to traffic systems.	Improve driving technique and promote activities to raise awareness.	Improve driving technique and promote activities to raise awareness, taking a customer-centered approach.	Equipped the CX-30 with control technologies to enable operation of the accelerator/brake pedals as intended, and Skyactiv-Vehicle Architecture technologies to realize smooth driving that makes drivers feel a sense of connectedness to their cars.	○	Improve driving technique and promote activities to raise awareness, taking a customer-centered approach.	
b. Manufacturing, logistics, office operations, social contributions, etc.	⑯ Reduce the environmental risk of the Mazda Group in Japan.	Promote environmental protection activities among Mazda Suppliers.	Expand promotion of the Mazda Green Purchasing Guidelines and revise if necessary.	Cascaded the Guidelines to all suppliers, and requested compliance.	○	Revise the Mazda Green Purchasing Guidelines and make the revised guidelines known to all suppliers.	
		Promote the establishment and introduction of environmental management systems (EMS).	<ul style="list-style-type: none"> <li>Support 100% establishment of EMS among major suppliers.</li> <li>Support and enhance EMS at secondary suppliers.</li> </ul>	<ul style="list-style-type: none"> <li>Supported 100% establishment of EMS among major suppliers.</li> <li>Supported and enhanced EMS at secondary suppliers.</li> </ul>	○	<ul style="list-style-type: none"> <li>Support 100% establishment of EMS among major suppliers.</li> <li>Support and enhance EMS at secondary suppliers.</li> </ul>	
	⑰ Promote activities to raise awareness of environmental issues.	Actively disseminate environmental information to improve environmental awareness among Mazda and Mazda Group company employees.	Continuously raise awareness inside the Group regarding environmental issues that society faces and measures throughout the entire life cycle of vehicles to reduce environmental impacts.	Continuously raise awareness inside the Group regarding environmental issues that society faces and measures throughout the entire life cycle of vehicles to reduce environmental impacts.	Completed the introduction of EcoAction 21 at all Mazda Group dealerships <sup>*1</sup> in Japan, and continued to support newly opened shops in obtaining certification.	○	Continue to provide follow-up support to newly opened shops in obtaining certification, to maintain the EcoAction 21-certified status at all Mazda Group dealerships <sup>*1</sup> in Japan.
			Continuously raise awareness of environmental issues and deepen understanding of biodiversity based on the needs of regional communities, preserve forests, and participate in regional cleanups.	Continuously raise awareness of environmental issues and deepen understanding of biodiversity based on the needs of regional communities, preserve forests, and participate in regional cleanups.	Provided follow-up support to auto parts dealership companies <sup>*4</sup> in operating their EMS through periodic reports and information exchange.	○	Provide follow-up support to auto parts sales companies <sup>*4</sup> to ensure that they can continue steady operation of their EMS.
			Promote environmental protection activities in regional communities by taking part in environmental volunteer activities (including regional cleanups and efforts to preserve biodiversity) and dispatching instructors to regional events and schools to offer environmental education.	Continuously raise awareness of environmental issues and deepen understanding of biodiversity based on the needs of regional communities, preserve forests, and participate in regional cleanups.	<ul style="list-style-type: none"> <li>Based on the needs of regional communities, conducted around 50 environmental activities in Japan and abroad, including forest preservation activities, support for protection of endemic species, regional cleanups, and carbon offset.</li> <li>Continuously raise environmental awareness by dispatching instructors for environmental education.</li> </ul>	○	Continuously raise awareness of environmental issues and deepen understanding of biodiversity based on the needs of regional communities, preserve forests, and participate in regional cleanups.
⑱ Inform the public about the Mazda Group's environmental protection activities.	<ul style="list-style-type: none"> <li>Disseminate information about the Mazda Group's environmental protection activities worldwide by hosting and actively participating in environmental events.</li> <li>Actively disseminate environmental information to improve environmental awareness among Mazda customers.</li> </ul>	Continue and enhance disclosure of information on the Mazda Group's environmental protection activities and education to raise the environmental awareness of customers.	Continue and enhance disclosure of information on the Mazda Group's environmental protection activities and education to raise the environmental awareness of customers.	Disseminated information by participating in Hiroshima Environment Day (June 3) and other environmental exhibitions and by holding and participating in various events.	○	Continue and enhance disclosure of information on the Mazda Group's environmental protection activities and education to raise environmental awareness of customers.	

\*1 For CO<sub>2</sub> emissions calculations, the CO<sub>2</sub> coefficient based on the standard (Keidanren's Commitment to a Low Carbon Society) of the Keidanren (Japan Business Federation) are used. (For the calculations of FY March 2020 and after, the coefficient of FY March 2019 is used.)

\*2 For FY March 2021, Mazda sets qualitative targets, since unable to maintain continuity by quantitative targets, because of uncertainty over future prospects regarding sales and production due to the COVID-19 pandemic.

\*3 Here "zero" is defined as the condition where the percentage of direct landfill is 0.5% or less of the total volume of waste generated.

\*4 Applicable to consolidated Group companies and equity-method Group companies in Japan.

## Mazda's Vision for Society's Relationship with Vehicles in the Future

Mazda is aware that the greatest challenge in curbing global warming is reducing CO<sub>2</sub> emissions, which is the major cause of this problem. The Intergovernmental Panel on Climate Change (IPCC) reported that global greenhouse gas emissions must be reduced by 40-70 percent as compared to 2010 levels by the year 2050 in order to limit the temperature increase to 2°C above pre-industrial levels. Also, the 2015 United Nations Climate Change Conference (COP 21) adopted the Paris Agreement. Against this backdrop, the world has been moving toward a decarbonized society. The realization of such a society requires major innovations, which will bring about changes in society and lifestyles. Mazda knows it must take these changes into account in its future operations.

### Around 2030: A society that aims for decarbonization, resource recycling, and coexistence in harmony with nature

Mazda predicts that around 2030 the world will see the evolution of energy and its related technologies in order to meet the unique characteristics of each country and region, as well as the steady introduction of low-carbon technology for all product life-cycle processes, including production, consumption by users, and disposal. Working toward decarbonization, energy structures will shift to be primarily based on renewable energy sources (including solar power, wind power, and biofuels and other renewable liquid fuels) and non-CO<sub>2</sub>-emitting hydrogen. In addition, the establishment of a smart grid,<sup>\*1</sup> whose main power supply comprises distributed energy<sup>\*2</sup> resources, is projected to build up an electric supply and demand structure characterized by the local consumption of locally produced power that is suitable for the respective regional environment. Mazda also forecasts progress in various initiatives to realize a recycling-oriented society that coexists in harmony with nature from the perspective of natural capital. This will be achieved through using resources without any losses, establishing circulation systems including those based on the three Rs (reduce, reuse, and recycle) for water, plastic, and other resources, and activities to contribute to biodiversity conservation. It is also expected that household use of solar power generation units and energy-saving housing will become increasingly commonplace, while plants and offices will succeed in both reducing their environmental impact and improving energy efficiency thanks to artificial intelligence (AI) and the Internet of Things (IoT).

\*1 A power transmission network that can optimize the flow of power with a function to adjust the flow of power from both the supply and demand sides.

\*2 Energy supplied from relatively small-scale power generation facilities and heat source equipment that have been installed near the relevant energy-consuming areas. Distributed energy generation has the advantage of reduced transmission loss and the ability to function as an emergency power source. In addition, it is considered to be effective in promoting widespread use of renewable energies and revitalizing local industries.

### Trends Regarding Vehicles

Around 2030, as indicated by the IEA,<sup>\*3</sup> while the number of vehicles powered by electricity or hydrogen will increase, vehicles featuring internal combustion engines incorporating electrification technologies,<sup>\*4</sup> highly efficient transmissions, and reduced body weight will account for a significant proportion of total vehicles. Vehicles equipped with internal combustion engines are projected to further improve in terms of efficiency, electrification technologies, and widespread and effective use of diversified fuels, such as natural gas and biomass that emit less CO<sub>2</sub>. Electric vehicles will be selected more often as the optimal form of mobility in regions where electricity can be generated with renewable energy or other cleaner sources. These factors will accelerate the trend toward lower carbon emissions. To substantially reduce CO<sub>2</sub> emissions throughout the entire vehicle lifecycle (on a Well-to-Wheel basis), a multi-solution approach that is tailored to each region is necessary in response to diversifying needs around the world, including regional needs, vehicle characteristics, fuel performance and characteristics, and power generation mixes. Additionally, as autonomous driving becomes prevalent in regions with advanced connectivity technologies and infrastructure innovations, unnecessary acceleration and deceleration and the stopping and starting of vehicles will decrease, which will lead to a reduced environmental impact.

A significant reduction in energy and resource losses over the entire vehicle manufacturing supply chain may be expected as a result of efforts for their more efficient use. Dramatic progress will also be made in recycling and waste reduction initiatives through the promotion of the three Rs.

\*3 International Energy Agency (see p. 63)

\*4 Hybrid systems, plug-in hybrid systems, etc.

### Around 2050: A sustainable society that sees advancements in efforts toward decarbonization, resource recycling, and coexistence in harmony with nature

Around 2050, a decarbonized energy structure will have been realized. A new system is expected to emerge that will make the boundary between power supply and consumption seamless by combining a system for renewable energy-based electricity supply and storage (including energy accumulation in the form of hydrogen) with a supply and demand structure capable of local consumption of locally produced electricity using a smart grid. In addition, humankind will see significant progress toward the realization of a sustainable society, along with advances in activities to create a resource recycling-oriented society and achieve coexistence in harmony with nature.

It will also become necessary to address new social problems. These problems include a high aging rate, a decline in the working-age population, rural depopulation due to concentration of the population in large cities, and increased stress caused by weakening real-world relationships.

### Trends Regarding Vehicles

Around 2050, as a result of technological innovations, methods of reducing CO<sub>2</sub> emissions from vehicles will be further diversified in accordance with the characteristics of each region and country, facilitating significant progress toward decarbonization. Vehicles powered by electricity and hydrogen will become ubiquitous, along with an increasing rate of low-carbon electricity generation in each country as part of the distributed energy resources that comprise smart grids.

Internal combustion engine-equipped vehicles running on renewable liquid fuels (including biofuels) will also find widespread use. Moreover, the great evolution of autonomous driving technology using vehicle and connectivity expertise will expand the commercial use of fully-autonomous driving technology as a means of supplementing the labor force in public transportation and logistics services. This will be instrumental not only in improving convenience and efficiency but also in reducing environmental impact. In this manner, vehicles are expected to enhance convenience while dramatically improving environmental performance, thereby significantly reducing CO<sub>2</sub> emissions. In addition, throughout the entire vehicle manufacturing supply chain, resource recycling will be realized through conversion to decarbonized energies and the establishment of recycling technologies.

Mazda believes that the above-stated innovations will be able to create a sustainable future in which people and cars coexist with a bountiful, beautiful earth, a future that offers safety and peace of mind and enriches lives by offering unrestricted mobility to people everywhere.

Referencing "Mazda's Vision for Society's Relationship with Vehicles in the Future," and aiming to realize the vision, the three environmental committees (Product Environment Committee, Business Site Environment Committee, and Social Contribution Committee) are currently collaborating to draw up the Company's next environmental medium-to-long-term plan. In 2019 Mazda established the 2030 Targets / 2050 Challenges to be achieved by its business sites.

## Medium-to-Long-Term Targets for Business Sites

Mazda is developing medium- and long-term initiatives also for business sites, based on the approach adopted under its long-term vision for technology development "Sustainable Zoom-Zoom 2030." The Company aims to develop business sites that will promote harmonious coexistence with the earth, improve employees' work environments, and coexist and co-prosper with local communities, from the perspectives of "the earth," "people" and "society."

As for environmental activities, in line with "Mazda's Vision for Society's Relationship with Vehicles in the Future," the Company will pursue and promote environmental technologies that will contribute to resource/energy value maximization (by minimizing consumption and fully utilizing resources/energy without any waste) and resource/energy diversification, looking ahead to 2030 and then 2050.

### Establishment of the 2030 Targets / 2050 Challenges

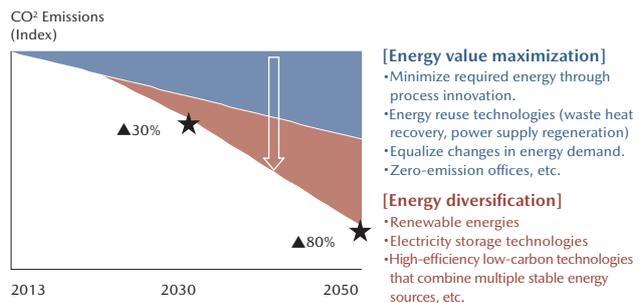
Mazda has established the 2030 Targets / 2050 Challenges in the three important areas: decarbonization, resource recycling for materials, and resource recycling for water. The Company has also stipulated its policy for initiatives to meet these targets and challenges. The policy indicates the two perspectives to be shared throughout the entire vehicle supply chain.

One is a "well-to-wheel perspective," which derives from the concept "from fuel extraction to consumption during driving." Mazda applies the "well-to-wheel" perspective in considering the reduction of environmental impact throughout the entire process, from resource/energy selection, through transportation, to recycling. The other is a "global & supply chain perspective." Based on these two perspectives, Mazda will push forward with the initiatives for decarbonization, resource recycling for materials, and resource recycling for water.

#### Decarbonization/ Low-Carbonization

The Mazda Group strives for energy value maximization and energy diversification, to achieve decarbonization and low-carbonization throughout the product life cycle from manufacture to disposal. As specific objectives, in comparison with FY March 2014 levels, the Group aims to achieve reductions in the global total CO<sub>2</sub> emissions from plants/offices and logistics operations by at least 30% by 2030 and by at least 80% by 2050.

2030	2050
Reduce the global total CO <sub>2</sub> emissions from plants/offices and logistics operations by at least 30% in comparison with FY March 2014 levels. (Promote low-carbonization)	Reduce the global total CO <sub>2</sub> emissions from plants/offices and logistics operations by at least 80% in comparison with FY March 2014 levels. (Promote decarbonization)

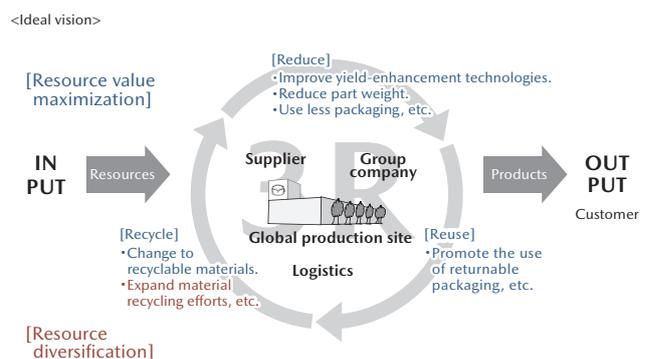


#### Resource Recycling for Materials

The Mazda Group continues to expand its global efforts for zero emissions and resource recycling, by such means as using resources without any losses, and the three Rs activities (to reduce, reuse, and recycle resources).

The Group aims to realize resource recycling overseas at the same level as in Japan in 2030, and to depart from thermal recycling and other combustion-based processes in 2050.

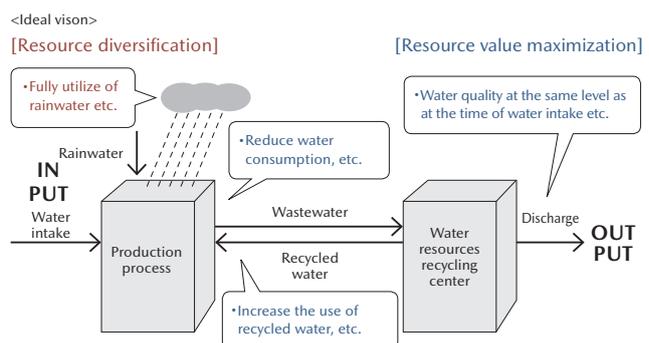
2030	2050
Achieve zero emissions* in manufacturing and logistics processes on a global basis. * The status in which landfill waste is reduced to 0.1% or lower of the total waste generated. The Mazda Group companies in Japan achieved zero emissions in 2018.	Achieve zero emissions through expanded resource recycling initiatives* in manufacturing and logistics processes on a global basis. * Break away from dependence on thermal recycling or other combustion-based recycling methods, and augment material recycling.



#### Resource Recycling for Water

To conserve water resources, the Mazda Group promotes activities to eliminate wasteful water use, and circulate water resources by treating used water so that it is the same quality as it was taken from nature. The Group aims to achieve these goals at the Hiroshima District in 2030, and then at global business sites in 2050.

2030	2050
Implement an optimal approach to water resources recycling and circulation at model plants* in Japan. •Fully utilize water without any waste, as a valuable resource that is a natural blessing. •Circulate water as a valuable resource that is a natural blessing, by treating used water so that it is the same quality as before it was used, and returning it to nature.	Implement an optimal approach to water resources recycling and circulation in global manufacturing processes. •Fully utilize water without any waste, as a valuable resource that is a natural blessing. •Circulate water as a valuable resource that is a natural blessing, by treating used water so that it is the same quality as before it was used, and returning it to nature.



\* Model plant: A pilot plant where new attempts are made, ahead of other facilities.