

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 2019

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

Items	FY March 2018 targets	FY March 2018 results	Self-assessment	FY March 2019 targets	ISO 26000 core subjects
Energy-and-global-warming-related issues					
Promoting resource recycling		(See Mazda Green Plan 2020) (see pp. 57-60)			6.5 The environment
Cleaner emissions					
Environmental management					

BASIC APPROACH ON ENVIRONMENTAL PROTECTION

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 CO₂ 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. 3). 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, 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. In FY March 2018, Mazda executed various efforts in each area based on the Mazda Green Plan 2020, and was able to achieve most of its goals (see pp. 57-60).

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.

a Philosophy and Policies for Environmental Initiatives



b Mazda Environmental Promotion Framework (as of March 31, 2018)



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 CO₂ 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-CO₂-emitting hydrogen. In addition, the establishment of a smart grid,^{*1} whose main power supply comprises distributed energy^{*2} 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,^{*3} while the number of vehicles powered by electricity or hydrogen will increase, vehicles featuring internal combustion engines incorporating electrification technologies,^{*4} 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 CO₂. 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 CO₂ 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. 65)

*4 Idling-stop systems, regenerative braking, 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 CO₂ 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 CO₂ 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.