

## Prevention of Pollution



### Progress in FY2022

- Eliminated the use of kerosene by electrifying air conditioners (Mizushima Plant)
- Obtained information on GADSL\*<sup>1</sup> regulated substances, upgraded our management system, and switched parts and made design changes in accordance with the ELV\*<sup>2</sup> directive in order to properly manage hazardous substances in products.

\*1 Global Automotive Declarable Substance List, a list to facilitate the exchange of information on environmentally hazardous substances, created by consensus of a group of automotive manufacturers in various countries

\*2 End-of-life vehicles

<Related pages>

P15 MITSUBISHI MOTORS' Materiality

P20 Materiality

P33 Environmental Management

P118 Environmental Data Related to Products and Business Activities

**(WEB)** Atmosphere/Wastewater Quality/PRTR-designated Pollutants Data (FY2022 Results)

[https://www.mitsubishi-motors.com/en/sustainability/esg/factory\\_archive2023.html](https://www.mitsubishi-motors.com/en/sustainability/esg/factory_archive2023.html)

### Basic Approach

Vehicles are products that can affect human health and biodiversity through the emission of environmental pollutants and chemical substances during business activities or product use.

MITSUBISHI MOTORS aims to contribute to the realization of a pollution-free society and has positioned it as one of the key challenges in its Environmental Plan Package. We are working to reduce the environmental impact of our products and the pollution resulting from our business activities.

In the stage of product development, along with reducing noxious components of exhaust gases and promoting the development of fuel economy improving technologies and electrification technologies, we strive to manage hazardous substances. In production processes, we are endeavoring to reduce air pollutants emitted from our plants by voluntarily enacting activity standards that are stricter than legal requirements. In order to reduce the impact on the environment from air pollutants and chemical substances, we engage in the prevention of pollution throughout all our business activities.

### Purifying Exhaust Gas while Driving

In addition to developing and popularizing electrified vehicles, which emit little exhaust while driving, we are endeavoring to develop and improve gasoline and diesel vehicles that emit fewer hazardous substances.

### Improving Gasoline Engine Vehicles

In the 1960s, emissions of carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxides (NOx) were restricted by regulations, and those restrictions have gradually been tightened since.

We have taken various measures since such regulations were first introduced. Currently, our products are compliant with strict emission regulations, thanks to the advanced technologies such as electronically controlled fuel injectors for combustion control, gasoline particulate filter (GPF) systems, and improved catalyst technologies.

### Improving Diesel Engine Vehicles

For diesel engine vehicles, emissions of CO, HC, NOx, and particulate matter have been regulated in some countries and regions, such as Japan, United States and European countries, since the 1970s.

Since such regulations were first introduced, we have taken measures including improving the combustion technology. To comply with these regulations, we have developed and produced clean diesel engines by systemizing combustion control technologies such as variable geometry turbocharger and high pressure fuel injection system, as well as after-treatment technologies such as NOx trap catalyst, diesel particulate filter, and urea selective catalytic reduction system.

Target  
● 3.9Target  
● 6.3Targets  
● 12.4  
● 12.5

## Clean Diesel Engine Systems

### VG\*1 Turbocharger

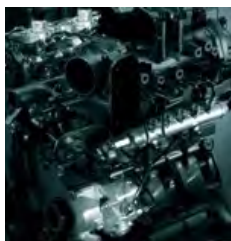
Continuously controlling the variable nozzle of the turbine optimally boosts power to the engine throughout its full operating range, improving fuel efficiency and reducing PM emissions.

\*1 Variable geometry



### Common Rail Fuel Injection System

Particulate matter and NOx can be generated due to incomplete combustion. In our vehicles, this is suppressed using a high-pressure fuel pump, common rail accumulator that stores highly pressurized fuel, and electronically controlled fuel injectors.



### Diesel Particulate Filter (DPF)

A DPF, a filter that removes particulate matter by collecting and burning it, substantially reduces emissions of particulate matter.

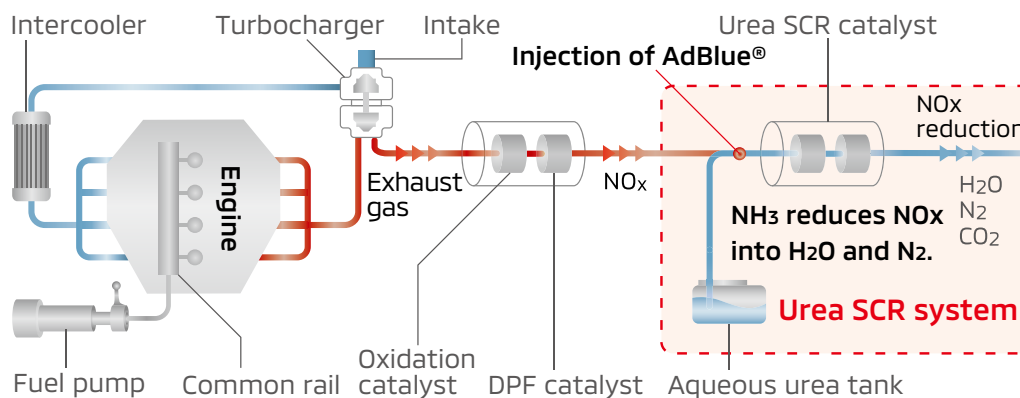


### Urea Selective Catalyst Reduction (SCR) System

Nitrous oxides (NOx) from diesel engines' emissions are reduced and purified using an aqueous urea solution (AdBlue®\*2), breaking them down into non-polluting nitrogen and water.

\*2 Registered trademark of the Verband der Automobilindustrie (VDA)

### [Clean Diesel Engine System (4N14 Engine)]



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## Reduction of Hazardous Substances

In accordance with the reduction targets of the Japan Automobile Manufacturers Association, Inc. (JAMA) and the EU's end-of-life vehicles directive (a recycling law), MITSUBISHI MOTORS is working to reduce the use of four substances (lead, mercury, cadmium, and hexavalent chromium). We are also taking measures to comply with regulations on the use of hazardous substances in each country in compliance with the REACH regulation\*<sup>1</sup> concerning substances and the Convention on POPs\*<sup>2</sup>.

At present, in addition to four substances and other heavy metals, the use of VOCs\*<sup>3</sup>, bromine-based flame retardants and various other substances is regulated. Regulations similar to European ones are being enforced in developing countries in Asia as well.

We are working to voluntarily reduce hazardous substances by setting internal technical standards.

\*<sup>1</sup> REACH stands for "Registration, Evaluation, Authorisation and Restriction of Chemicals." Enacted on June 1, 2007, the REACH regulation is a general system to register, evaluate, authorize and restrict the use of substances

\*<sup>2</sup> Persistent Organic Pollutants

\*<sup>3</sup> Volatile Organic Compounds

► Data (p. 119): Emissions of Sulfur Oxide, Nitrogen Oxide, VOC (Volatile Organic Compounds) and Ozone-Depleting Substances

## Management of Material Data by IMDS

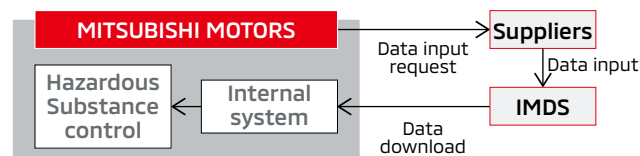
Data on the hazardous substances contained in vehicle parts delivered by suppliers are collected by the IMDS\*<sup>4</sup>, an international system for collecting such data. Together with overseas, we utilize the collected data under a globally centralized internal system for reducing hazardous substances.

In cooperation with suppliers, we are complying with the REACH regulation, a general system for the registration, evaluation, authorization, and restriction of substances used in the EU.

In FY2022, we renovated our internal management system to properly manage hazardous substances in products by incorporating information on GADSL-regulated substances. We collect IMDS data inputted by suppliers and utilize the system to automatically determine the compliance status with regulations if any newly regulated substances are found in components, based on the content and materials used. We also implemented component replacement and design changes in accordance with the ELV Directive.

\*<sup>4</sup> International Material Data System

### Flow of Data Collection through IMDS



## Reduction of In-Cabin VOCs

To provide customers with a healthy and safe cabin space, we work to reduce VOCs inside the cabin.

VOCs are organic compounds that are easily volatilized at room temperature such as formaldehyde and toluene. These compounds are thought to cause sick building syndrome, and may irritate the eyes, nose, and throat. In an automobile cabin, they are mainly generated by adhesives and paint used in interior parts.

Please see the JAMA website for details regarding the Voluntary Guidelines.

[WEB](https://www.jama.or.jp/english/news/past/release/2005/050214.html) <https://www.jama.or.jp/english/news/past/release/2005/050214.html>

### Progress

We are working to develop materials with low VOC emissions to reduce in-cabin VOCs.

### Example of Measures to Reduce VOCs

Carpet	Reduced aldehydes in pile adhesives
Seat	Reduced organic solvents in fabric adhesives
Ornaments	Reduced VOCs by using spun-dyed high-gloss interior parts

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## Preventing Air Pollution

### Reduction of VOC Emissions from Production Processes

MITSUBISHI MOTORS is applying the waterborne 3WET paint method\*<sup>1</sup> to the painting process to reduce VOC emissions. In Japan, we use this method at the Mizushima Plant and the Okazaki Plant. Overseas, the system is used on the No. 3 paint line at Mitsubishi Motors (Thailand) Co., Ltd. (MMTh).

We are also upgrading our robotic and other painting systems, reducing the amount of paint used by adjusting production lots and collecting more used thinner. Through these moves, we are reducing VOC emissions from vehicle production.

\*<sup>1</sup> With this method, water-soluble paints are used for the middle and top coats. Solvent-based paint is used only for the clear overcoat.

▶ Data (p. 119): VOCs



New paint plant (MMTh)

### Management of Air Pollutants

We follow laws and regulations to manage the concentrations and amounts of such air pollutants as nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>) and soot emitted in production processes.

In addition, we are promoting the replacement of equipment that uses fossil fuels such as kerosene with electric devices, including electric heat pumps, to simultaneously reduce air pollutants and CO<sub>2</sub> emissions.

#### TOPICS

#### Eliminating the Use of Kerosene through Electrification (Mizushima Plant)

At the Mizushima Plant, in FY2022 we replaced the air conditioners in the main building and PR Center with electric air conditioners, transitioning from kerosene-powered absorption chiller-heaters to fully electrified systems.

This move reduced kerosene use within the plant to zero, lowering atmospheric pollutants such as NO<sub>x</sub> and particulate matter, as well as achieving an annual reduction of 50 tons of CO<sub>2</sub> emissions due to energy-saving effects.

## Management of Chemical Substances

### Appropriate Management of Chemical Substances

We have introduced a chemical substance management system for using chemical substances. Before deploying substances, we examine their physical and

chemical properties and the details of usage plans, as well as legal requirements, conduct risk assessments. Finally, we judge whether they can be introduced and educate workers well. We also use this system to conduct centralized management of the most recent Safety Data Sheet (SDS) information. In addition, we use data from this system to ascertain the quantity of PRTR\*<sup>2</sup> substances used and report on their usage and emissions to Ministry of Economy, Trade and Industry, as well as other aspects of legal compliance.

\*<sup>2</sup> PRTR: Pollutant Release and Transfer Register

### Appropriate Management of Hazardous Waste

We manage hazardous waste to avoid importing or exporting hazardous waste that is restricted by the Basel Convention on the Control of Transboundary Movements of Hazardous and Their Disposal\*<sup>3</sup>.

We also transport and treat waste produced in Japan appropriately, based on various legal requirements.

\*<sup>3</sup> This convention stipulates international frameworks and procedures related to restrictions on international transfer of a certain types of waste.

### Appropriate Management of Waste Containing PCBs

Harmful polychlorinated biphenyls (PCBs) are contained as insulation oil in transformers and condensers that were manufactured a long time ago. We process waste containing PCBs appropriately, in accordance with the Act on Special Measures concerning Promotion of Proper Treatment of PCB Waste.