Prevention of Pollution

It is possible that the air pollutants and chemical substances emitted due to business activities will have an impact on human health and biodiversity.
In order to contribute to the realization of a sustainable society, Mitsubishi Motors considers the prevention of pollution to be one of the material issues for the Company. In the stage of product development, along with promoting the development of fuel economy improving technologies and electric vehicle technologies, we strive to manage to hazardous substances. In production processes, we are endeavoring to reduce air pollutants emitted from out 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 of our business activities.

Initiatives with regard to Products

Development of Electric Vehicle Technologies

Gasoline and diesel engines inevitably generate harmful components that are the cause of air pollution when fuel is consumed.
Mitsubishi Motors will reduce the emission of harmful substances by developing electric vehicle technologies and popularizing electric vehicles.

TOPICS

Provision of *Outlander PHEV* and *i-MiEV* to Da Nang City in Vietnam

In April 2018, we provided Da Nang City in Vietnam with two *Outlander PHEV* and two *i-MiEV* and two quick chargers. These electric vehicles are being used for transportation to sightseeing areas in the city and in the nearby World Heritage site of Hoi An, for example.
Vietnam is working to realize green cities with clean air, and in 2008, an Environmental City Plan was announced with the aim of the environmental urbanization of Da Nang by 2020. We will conduct a joint study regarding CO_2 reduction effects from electric vehicles and the effective use of electric vehicles in sightseeing areas.

Prevention of Pollution

Initiatives with regard to Products

Purifying Exhaust Gas while Driving

Vehicles powered by gasoline and diesel engines inevitably emit combustion gases from the engine while driving. These exhaust gases contain pollutants. Mitsubishi Motors constantly develops and promotes gasoline and diesel engine vehicles that emit lower concentrations of these noxious exhaust gases.

Improving Gasoline Engine Vehicles

Since the 1960s, emissions of carbon monoxide, hydrocarbons, and nitrogen oxides (NOx) have been steadily restricted by regulations.
Mitsubishi Motors has taken various measures since such regulations were first introduced. We currently comply with these regulations by applying electronically controlled fuel injectors and advanced catalyst technologies to the combustion control system.

Improving Diesel Engine Vehicles

For diesel engine vehicles, carbon monoxide, hydrocarbons, NOx, and particulate matter have been regulated in some countries, 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 technology such as VG turbochargers, controlling combustion with a common rail fuel injection system, introducing after-treatment using NOx trap catalysts, and diesel particulate filters.

VG Turbocharger

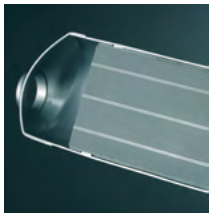
The VG turbocharger helps to improve fuel economy and suppress emissions of particulate matter through optimum supercharging across the engine's operating range.

Common Rail Fuel Injection System

Particulate matter and NOx can be generated due to incomplete combustion. In Mitsubishi Motors 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)

This substantially reduces particulate matter.



TOPICS

New *Delica D:5* Purifying Exhaust Gas

The *Delica D:5* that was released in February 2019 is equipped with a massively-renewed 2.2l common rail DI-D clean diesel turbo engine.
The urea SCR*1 system that purifies emissions from the turbo diesel engine has been used by Mitsubishi Motors for the first time. By means of the aqueous urea solution AdBlue®*2, nitrogen oxide is stably purified.

*1 Abbreviation of Selective Catalytic Reduction.
*2 AdBlue® is a registered trademark of Verband der Automobilindustrie (VDA).

Prevention of Pollution

Initiatives with regard to Products

Reduction of Hazardous Substances

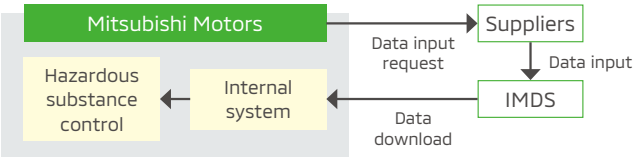
In accordance with the reduction targets of the Japan Automobile Manufacturers Association, Inc. and EU end-of-life vehicles directive, Mitsubishi Motors is working to reduce the use of four substances (lead, mercury, cadmium, and hexavalent chromium). We have established internal technical standards to voluntarily reduce hazardous substances. We are also taking measures to comply with regulations on the use of hazardous substances in each country in compliance with the REACH regulation* concerning substances. At present, in addition to four substances and other heavy metals, the use of VOCs (volatile organic compounds), 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.

* 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

Material Data Control by the International Material Data System (IMDS)

Data on the hazardous substances contained in vehicle parts delivered by suppliers are collected by the International Material Data System (IMDS), an international system for collecting such data. Together with overseas plants such as Mitsubishi Motors (Thailand) Co., Ltd. (MMTh), 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.

◆ Flow of Data Collection through IMDS



Reduction of In-Cabin VOCs

To provide customers with a healthy and safe cabin space, Mitsubishi Motors works to reduce volatile organic compounds (VOCs) inside the cabin.
VOCs are compounds that easily volatilize 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.
The Japan Automobile Manufacturers Association, Inc. (JAMA) established voluntary guidelines for reducing vehicle cabin VOC concentration levels (the “Voluntary Guidelines”) applicable to new model passenger cars marketed starting from the 2007 fiscal year.
Please see the JAMA website for details regarding the Voluntary Guidelines.
(WEB) http://www.jama-english.jp/release/release/2005/050214.html

Progress

In order to reduce the amount of in-cabin VOCs, we are taking measures to reduce the sources of VOCs as well as VOCs themselves. All new models since the Mitsubishi i launched in January 2006 satisfy the voluntary guidelines set by the Japan Automobile Manufacturers Association (JAMA).

◆ Example of Measures to Reduce VOCs

Central panel	Reduced organic solvents in the surface painting
Carpet	Reduced aldehydes in pile adhesives
Seat	Reduced organic solvents in fabric adhesives
Ceiling	Adsorbs and decomposes formaldehyde using the clean air filter deodorizing function
Air-conditioner	Reduces VOCs with clean air filter with deodorizing function

Prevention of Pollution

Efforts in Production

Preventing Air Pollution

Reducing VOC Emissions

We endeavor to reduce the amount of VOCs emitted from vehicle body production by reducing consumption of paint and improving recovery rate of used paint thinner. We achieve this by updating painting robots and adjusting the painting production lot size.

Deodorizing equipment for electrodeposition drying furnaces to reduce VOC emissions (Okazaki Plant)

Reducing NOx and SOx*1 Emissions

To reduce NOx emissions, we introduced low NOx content boilers as the heat sources used for paint processes and are promoting use of low NOx content burners. To reduce SOx emissions, we changed the fuel for the boilers to kerosene or city gas, which has less sulfur content.

*1 NOx: Nitrogen oxide, SOx: Sulfur oxide

Reducing Particulate Matter

We abolished waste incinerators to reduce the generation of soot and dioxins.

Management of Chemical Substances

Control of PRTR*2 Substances

We have long since examined the physical properties and details of usage plans of new chemical substances by using the “substances toxicity prior examination system,” to determine whether or not those new chemical substances may be introduced, in order to emphatically suppress the toxicity from highly risky chemical substances.

*2 Abbreviation of "Pollutant Release and Transfer Register." Report on the discharge removal quantities of substances

Appropriate Management of Hazardous Waste

Mitsubishi Motors manages hazardous waste so that we do not import or export hazardous waste which is restricted by the Basel Convention on the Control of Transboundary Movements of Hazardous and Their Disposal.
In addition, in case of domestic transportation and disposal of hazardous waste, we make efforts to appropriately transport and dispose hazardous waste to prevent the exposure of toxic materials.

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. Based on the Act on Special Measures concerning Promotion of Proper Treatment of PCB Waste, we promote the correct processing of equipment that uses low-concentration PCB and waste that contains PCB, and we plan for disposal by the processing deadline.