



Reducing CO₂ from Production

Targets and Achievements

The Mitsubishi Electric Group continues to promote activities that combine the initiatives for reducing CO₂ originating from energy and for reducing non-CO₂ greenhouse gases (SF₆, HFCs, and PFCs) with the aim of reducing CO₂ emissions from production.

The 9th Environmental Plan (fiscal 2019–2021) is the final environmental program before Environmental Vision 2021 is to be achieved. The goal of this plan is to reduce total annual emissions of greenhouse gases to a CO₂ equivalent of 1.47 million tons or less in fiscal 2021. By achieving this, we will have outperformed our target of 30% reduction from the base year level*, which had been set at the time of formulating Environmental Vision 2021, and will actually achieve a 45% reduction from the base year level.

In fiscal 2021, emissions of greenhouse gases amounted to a CO₂ equivalent of 1.16 million tons and achieved our target of less than 1.47 million tons. One of the major factors behind this accomplishment is the steady reduction of CO₂ emissions originating from energy.

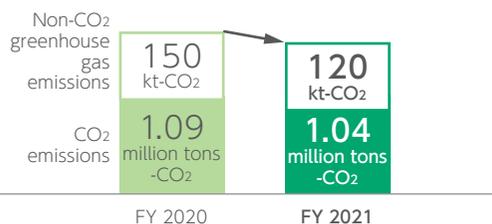
This was owing to the introduction of high-efficiency machinery, the switching of fuels, and the progress in thorough waste elimination. Another factor was the acceleration in the reduction of non-CO₂ greenhouse gases, owing to the replacement of traditional refrigerant gases with those having lower global-warming potential (GWP) and the increase in the amount of refrigerant gases recovered during manufacturing processes overseas.

In January 2020, the Mitsubishi Electric Group's targets of reducing greenhouse gases by 2030 were approved as science-based targets, certified by the Science Based Targets (SBT) Initiative. We will hereafter substantiate our roadmap for long-term reductions in greenhouse gas emissions and implement further measures.

* Base year for CO₂: Mitsubishi Electric Corporation, fiscal 1991; affiliates in Japan, fiscal 2001; and overseas affiliates, fiscal 2006.

Base year for non-CO₂ greenhouse gases: Mitsubishi Electric Corporation and affiliates in Japan, fiscal 2001; overseas affiliates, fiscal 2006.

Reducing CO₂ Emissions from Production (Mitsubishi Electric Group)



Note: Calculations were made using the following coefficients:

- Emission coefficient for Japan: 0.487 (published by the Federation of Electric Power Companies of Japan in 2013, when two nuclear power plants are in operation)
- Overseas emission coefficient: Calculated with reference to figures published by the Japan Electrical Manufacturers' Association (JEMA) in 2006.
- The global warming potential (GWP) of non-CO₂ greenhouse gases was calculated in reference to the figure published in IPCC's Second Assessment Report (1995).

Initiatives to Reduce CO₂ Originating from Energy and Their Results

Toward reducing CO₂ originating from energy, our activities focus on systematically introducing and updating high-efficiency and energy-saving equipment, improving operations, and extending energy conservation measures to production lines. As a result, we managed to reduce CO₂ emissions originating from energy by 17 kt to 1.04 million tons in fiscal 2021.

Half of the major achievements were realized through the introduction of high-efficiency machinery, while activities to develop energy-efficient technologies implemented by an internal technical committee also produced solid results. These activities also focus on visualizing and reducing the wasteful use of utilities and production equipment during non-operational hours.

In the classification system (SABC assessment) based on Japan's Energy Savings Law, 12 out of 20 specific Group companies in Japan, including Mitsubishi Electric, have been recognized as excellent business operators (S Class) in terms of energy conservation.

Initiatives to Reduce SF₆, HFCs and PFCs, and the Results

Three types of non-CO₂ greenhouse gases are emitted by the Mitsubishi Electric Group in its business activities: SF₆ (sulfur hexafluoride), HFCs (hydrofluorocarbons), and PFCs (Perfluorocarbons). SF₆ is used inside gas-insulated switchgear for electrical insulation, as well as in the etching process during semiconductor and liquid-crystal display production.

HFCs are used as refrigerants in air conditioners and refrigerators, while PFCs are used during the etching process in production of semiconductors and liquid-crystal displays.

In fiscal 2021, we continued our initiatives for switching to the use of refrigerants with lower GWP, improving operations, and achieving greater gas recovery and abatement. Owing to these measures, emissions turned out to be 62 kt less than our initial prediction, which anticipated a year-on-year increase due to growth in business. Due to an increase in production, increased emissions were anticipated, however there turned out to be a 29 kt reduction compared to the previous fiscal year.

Greenhouse Gases	Past Measures	8th Environmental Plan			9th Environmental Plan		
		2016	2017	2018	2019	2020	2021
SF ₆ (Sulfur hexafluoride)	Vacuum pump Recovery/abatement Early gas-leakage detection	Japan: Expand introduction of recovery/abatement systems					
		Overseas: Improve operation during filling process		Overseas: Strengthen SF ₆ reduction measures			
HFCs (Hydrofluorocarbons)	Recovery	Japan: Switch refrigerant (from R410A to R32)					
		Japan: Completed construction of refrigerant recovery scheme		Overseas: Switch refrigerant (from R410A to R32)			
		Overseas: Construct refrigerant recovery/disposal scheme					
PFCs (Perfluoro-carbons)	Recovery/abatement system	Japan: Expand introduction of recovery/abatement systems					

Under Environmental Vision 2023, our three-year plan that started in fiscal 2022, we set our target for total greenhouse gas emissions in fiscal 2024 at 1.2 million tons or less, corresponding to a 9% reduction from the base year of fiscal 2017, to conform to the target value required for Science Based Targets (SBT) certification. We also set forth the target of reducing the amount of emissions per unit of sales by 6% or more compared to the base year of fiscal 2020. Furthermore, we set a target of adopting CO₂-free renewable energy worth 2% of our electricity consumption during production (approx. 20,000 MWh/year).

Additionally, to ensure the achievement of Environmental Sustainability Vision 2050 and the SBT targets, we issued “Energy-Saving Guidelines” for buildings and production facilities.

- **Building Energy-Saving Guidelines**

These guidelines mainly require that consideration be given to the heat insulation performance of buildings when constructing new factories, and to the introduction of a certain amount of renewable energy.

- **Production Facility Energy-Saving Guidelines**

These guidelines cover energy-saving technologies in general and require active consideration of using Mitsubishi Electric products (e.g., high-efficiency electrical equipment, control devices to monitor energy savings, LED lighting, heat pumps, inverters, and regenerative electric power converters).

We will continue to promote thorough energy-saving activities through our business operations.

Reducing Resource Inputs

Targets and Achievements

The Mitsubishi Electric Group is reducing resource inputs by reducing the size and weight of its products. Our aim under the 9th Environmental Plan (fiscal 2019–2021) was to reduce resource inputs for 64 product groups by an average of 40% compared to fiscal 2001, and this reduction target was built into our product development plans. Individual products that are not continuously manufactured and products built to customer specifications are outside the scope of resource input reduction.

The average reduction rate of resource inputs was 43% in fiscal 2021, so we have achieved the target.

From Environmental Plan 2023 onward, we will work to reduce the size and weight of our products, as well as to promote the introduction of recycled plastics in order to reduce resource inputs. We set a target to increase the ratio of recycled plastics to total purchases of resin materials to 10% by fiscal 2024. In particular, we will actively utilize our Group’s plastic recycling technologies.

Products Making Notable Progress in Resource Reduction in Fiscal 2021 (Compared to Fiscal 2020)

- TFT-LCD modules: 12% reduction
- Hot water supply systems and equipment: 6% reduction
- IH cooking heaters: 6% reduction
- Gas-insulated switchgear: 5% reduction

Average Reduction Rates of Resource Inputs for 64 Product Groups with Fiscal 2001 as Base Year (Mitsubishi Electric Group)

