

## Incorporating Environmental Preservation in Business Activities

Murata has been working to reduce the environmental load of its products, at the same time actively addressing the need to reduce the environmental load of its business activities. These efforts encompass prevention of global warming, resource conservation, waste reduction and proper management of chemical substances.

### Prevention of Global Warming

Greenhouse gases such as carbon dioxide that are emitted during production activities can have an important effect on everyday life, as they may contribute to global warming that leads to climate change and rising sea levels. For its part, Murata is instituting energy saving measures intended to prevent global warming.

#### Energy Conservation Activities to Date

In the effort to prevent global warming, Murata has been aggressively promoting energy-saving initiatives in the utility and production facilities of plants and subsidiaries. As a result of various initiatives implemented in 2002, we have achieved a number of successes in individual cases. However, CO<sub>2</sub> emissions per unit net sales (carbon dioxide emissions per basic unit of net sales) worsened by 45% compared with 1990 levels. This resulted from the significant reduction in unit pricing of our products against the increase in our production volume in 2002, which caused our net sales to decrease.

Our main activities for 2002 are outlined below.

#### Energy-saving Activities in Utility Facilities

Utility facilities consume a large amount of energy, as they supply hot and cold water, compressed air, and other inputs required for production activities.

#### Introduction of an Electromagnetic Water Treatment System

The operation efficiency of the facility was improved with the introduction of an electromagnetic water treatment system for treating the cooling water used in the facility. This innovation reduced annual CO<sub>2</sub> emissions by 69 metric tons.



Electromagnetic Water Treatment System

#### Introduction of a Heat Exchanger

We introduced a heat exchanger that utilizes outdoor air to generate cooling water in winter. Introduced in February, this innovation reduced CO<sub>2</sub> emissions by 141 metric tons compared with the preceding year.



Heat Exchanger

#### Control of Compressed Air Leakage

Inspection and repair of leaks in the compressed air system used for production processes reduced annual CO<sub>2</sub> emissions by 92 metric tons.



Inspection for leakage of compressed air

#### Other Improvements

The following additional improvements reduced total annual CO<sub>2</sub> emissions by 1,864 metric tons.

- Suspension of operation of transformers when not under load
- Switch to high-efficiency transformers
- Introduction of mechanical seals on cooling water pumps
- Provision of outdoor air for compressors
- Lighting updated to hafnium
- Energy consumption reduced through introduction of energy-saving campaign and other activities for staff

These energy-saving activities contributed to a 2,166-metric-ton reduction in CO<sub>2</sub> emissions in fiscal 2002.

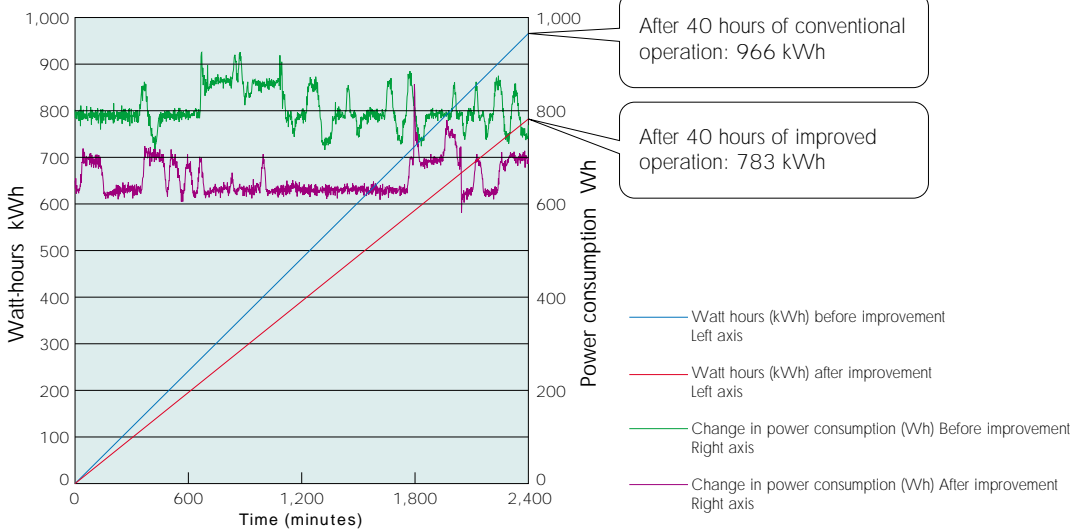
### Energy-Saving Activities for Heat Treatment Equipment

Heat treatment equipment consumes much of the energy required during production activities. Murata long ago developed a proprietary technology for heat treatment equipment and has incorporated energy conservation innovations in various devices and applications. As a result, we have been able to supply highly energy-efficient equipment. For example, we have reduced power consumption and thereby increased the energy efficiency by decreasing the weight of the mesh belt used as the transport mechanism and improving the thermal insulation in the furnace wall of the firing furnace.

### Reduction in Power Consumption of Mesh-Belt-Type Firing Furnace

By reducing the weight of the metal mesh belt of the conveyor as well as the conveyance devices inside the firing furnace (a weight reduction of 58% compared with conventional belts), we have achieved a roughly 20% reduction in power consumption. Moreover, we reduced total power consumption by 25% by controlling heat conduction loss through the wall of the firing furnace and by reviewing heat emissions. We will continue to promote these measures in the interests of improved energy efficiency.

#### Energy Conservation from Reduced Belt Weight



See page 26.

### Enhancing Energy Saving

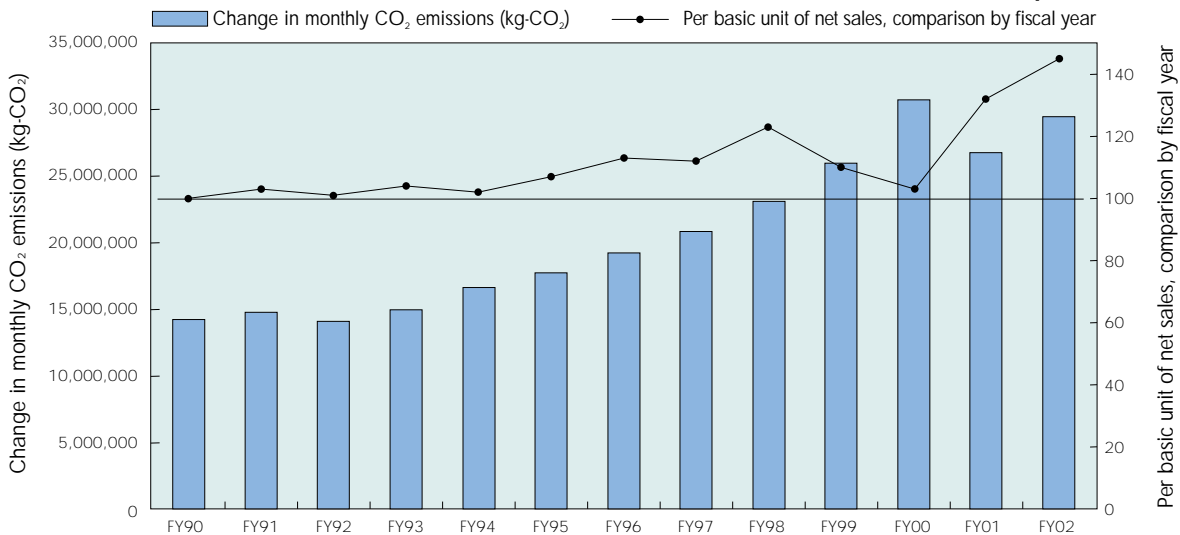
Currently, with the aim of achieving greater energy savings, we are promoting activities to reduce carbon dioxide missions per basic unit of net sales by 30% compared with fiscal 1990 levels as of the end of fiscal 2010.

As a specific initiative, we are advancing the following policies companywide with a focus on specialist technicians and energy managers.

- Innovations in utility equipment
- Energy saving innovations for heat treatment equipment and effective use of waste heat
- Improvements in facility productivity and innovations in heat treatment technology
- Development of more compact products

In addition, we will continue to seek reductions in the use of chemical substances imparting an environmental impact in the manufacturing process. This will apply even to countermeasures for the non-energy group of greenhouse gases - such as PFCs, HFCs, SF<sub>6</sub> and the like - which have been listed as subject to regulation at the COP3 (the Third Conference of Parties to the United Nations Framework Convention on Climate Change)

### Transition in carbon dioxide emissions and basic unit of net sales in fiscal 1990 (Totals in Japan)



Note: The conversion of energy consumption to carbon dioxide emissions is calculated according to Murata's own standards.