

Environmental Conservation in Manufacturing Operations

Komatsu is advancing energy conservation to mitigate climate change as well as pursuing zero emissions by utilizing waste as resources.



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Through a series of activities from manufacturing to logistics, Komatsu has been promoting measures designed to be industry-leading in the areas of climate change mitigation measures, activities for the efficient use of resources, and reductions of substances of environmental concern, in keeping with its medium- to long-term environmental planning. In particular, with regard to greenhouse gases, Komatsu has been concentrating on improvements in CO₂ emissions reductions. Despite increases in manufacturing volume, the company has succeeded in reducing emissions compared with the previous fiscal year.

From now, Komatsu will further improve the degree of environmental conservation across the company, including operations outside Japan, enhancing its approach as a truly global company. Komatsu will also continue to carry out its responsibilities to society as it promotes a *Monozukuri* (manufacturing competitiveness) revolution, with safety, environment, and compliance as major premises for the continuation of its operations.

Environmental Conservation in Manufacturing Operations

Komatsu's manufacturing operations generate environmental impact through "input" to manufacturing, including the use of electricity and other forms of energy as well as various forms of natural resources, such as water and raw materials, and also through "output" from manufacturing, including air emissions, waste materials, and effluent. Based on this understanding, Komatsu plants are aiming to minimize environmental impacts from both input and output and Komatsu is actively committed to implementing environmental conservation activities at its manufacturing facilities. In addition, Komatsu is expanding this way of thinking into Komatsu manufacturing activities around the globe, thus resulting in global and Group-wide environmental conservation activities.

Three Major Targets

- Mitigation of climate change (energy conservation)
 - Effective utilization of resources (zero emissions)
 - Environmental risk management
- Chemical substance control
Measures to renovate underground oil tanks permanently
Compliance and pollution mitigation and prevention

Activities for Reducing Environmental Impact from Upstream and Downstream Operations

- Green procurement
- Environmental conservation in logistics
- Support for environmental activities at sales agencies and rental companies

Mitigation of Climate Change (Energy conservation)

Basic Elements of Komatsu's Efforts

In order to mitigate climate change, Komatsu has adopted as an indicator CO₂ emissions per unit of manufacturing value with regard to electricity, fuel gas, fuel oil, and any other type of energy used in its manufacturing operations. The company undertakes various activities to cut these CO₂ emissions with a target of achieving a 25% reduction by FY2010 from the FY1990 level. In FY2006, Komatsu has spread various improvements horizontally, guided primarily by the Energy Saving Working Group. As a result, CO₂ emissions per unit of manufacturing value have decreased by 27.3% compared to the FY1990 level, enabling Komatsu to meet its medium- to long-term objectives ahead of schedule.

Means for Further Improvement

As for energy conservation on the demand side, the manufacturing divisions are at the core of efforts undertaken for reductions in amounts of energy consumed and other areas, as depicted in the chart on the right. With Energy Saving Working Group activities, horizontal development among all business units is taking place. As for conservation on the supply side, the utility administrative divisions are the main focus of implementation, and significant effects have already been achieved, in particular as a result of successful attempts since FY2001 to introduce energy conservation equipment through Energy Service Company (ESCO*) operations. Moreover, in FY2006, Komatsu undertook several major improvements, including a fuel conversion to natural gas and a change from a cupola furnace to an electrical furnace.

Main Efforts Undertaken by the Manufacturing Division

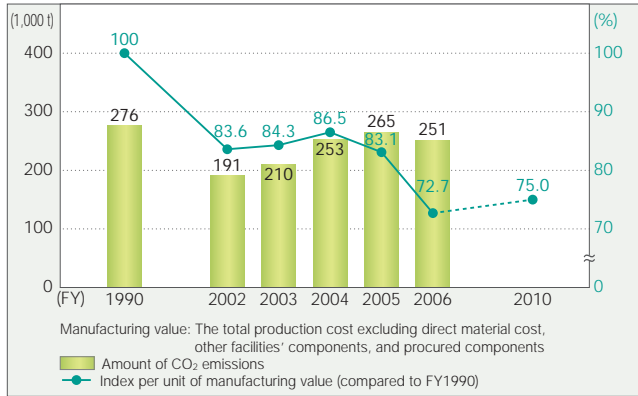
Cutting stand-by electricity of manufacturing equipment
Using low-pressure air blowers in drying process (reduction of pressurization)
Introducing inverter-controlled pumps and motors
Painting plant roofs with heat-insulating paint
Introducing high-efficiency lighting
Distributing compressors

Efforts Mainly Through ESCO Operations

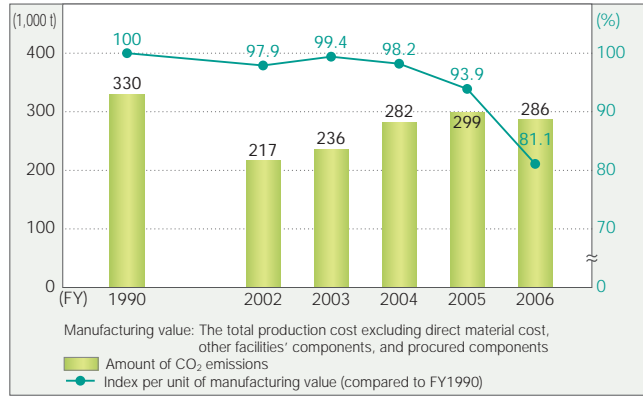
FY	Effort
2001	•Oyama Plant: Displacement air-conditioning equipment, gas turbine cogeneration
2002	•Awazu Plant: Absorption chiller cascade cooling, thermal recycling of cutting oil •Komatsu Zenoah Kawagoe Plant: Cogeneration
2003	•Oyama Plant: Displacement air-conditioning equipment, high-efficiency lighting •Osaka Plant: Displacement air-conditioning equipment, high-efficiency lighting •Komatsu Zenoah Koriyama Plant: Cogeneration, displacement air-conditioning equipment
2004	•Awazu Plant: Cogeneration, displacement air-conditioning equipment
2005	•Oyama Plant: Displacement air-conditioning equipment, high-efficiency lighting in new plant •Komatsu Castex Himi Plant: Welding improvements (cupola furnace → high-frequency furnace)
2006	•Oyama Plant: Change of the energy source to natural gas for gas turbine cogeneration

*Energy Service Companies (ESCOs) provide comprehensive services with regard to energy conservation in factories or buildings, enabling a realization of energy conservation while maintaining the same performance as before, and they guarantee that energy conservation effects will result from the measures they recommend.

Amount of CO₂ Emissions by Komatsu Manufacturing Facilities and Komatsu Castex Himi Plant



Amount of CO₂ Emissions by Komatsu and the Komatsu Group's Manufacturing Facilities in Japan



Activities for the Effective Utilization of Resources

Waste

In tandem with reducing the volume of waste generated during manufacturing operations, Komatsu concentrates on zero emissions* activities to recycle waste materials.

From FY2006, Komatsu has established new medium-term targets and been undertaking activities to achieve it. The new targets are (1) continuing zero emissions and (2) achieving a 15% or more reduction by FY2010 in the volume of waste generated per unit of manufacturing value compared with the FY2005 level.

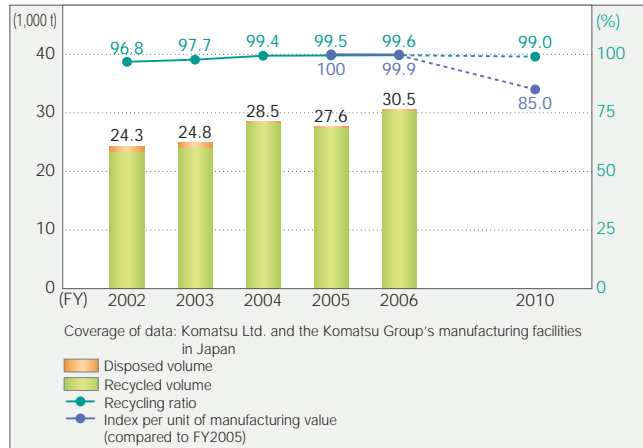
Komatsu has continued to achieve zero emissions through strict waste separation and utilization of waste material as valuables, resulting in a recycling ratio of over 99%. However, reduction in the volume of waste generated per unit of manufacturing value was 0.1% compared with the FY2005 level. While the company did not attain its single-year target of a 3% reduction compared with the previous fiscal year, it did achieve about a 30% reduction in the volume of waste generated per unit of manufacturing value regarding wood waste compared with the previous fiscal year. In particular, the Osaka Plant achieved significant reductions by eliminating wood-framed packaging (for hydraulic shovel attachments from China and the PC3000 from Germany) and changing to steel returnable pallets. As its next step, the company will pursue further improvements to attain its medium-term target.

*Komatsu defines "zero emissions" as a waste material recycling ratio of 99% or more.

Conserving Water Resources

Since FY2006 Komatsu Group manufacturing facilities in Japan have taken up a new medium-term target—achieving a 10% or more reduction by FY2010 in the volume of water used per unit of manufacturing value from the FY2005 level. By practicing reuse during processing and eliminating wasteful practices on a day-to-day basis, Komatsu reduced the volume by 11.3% compared with FY2005, reaching its FY2010 medium-term target in advance. In particular, the Osaka Plant, Engine & Hydraulics Business Division Koriyama Plant, and the Komatsu Utility Kawagoe Plant reduced their usage volume around 30% on a unit basis compared with the previous fiscal year. In the years to come Komatsu will make further attempts to reduce the volume of water resources used.

Volume of Waste* Generated by Komatsu and the Komatsu Group's Manufacturing Facilities in Japan



*In keeping with changes to the definition of the volume of waste generated, figures from previous fiscal years have been modified accordingly.

Volume of Water Resources Used by Komatsu and the Komatsu Group's Manufacturing Facilities in Japan

