

Mitigating Climate Change

Komatsu is reducing CO₂ emissions generated by its business activities while delivering products that help customers promote their environmental activities.

Mitigating Climate Change through Products and Services

Introducing a New Type of Hybrid Hydraulic Excavator to World Markets

The new HB205-1 hybrid hydraulic excavator features 25% higher fuel efficiency than the PC200-8, which is equipped with a conventional engine. This has earned it certification as a low-carbon emission construction machine by the Ministry of Land, Infrastructure, Transport and Tourism. The new hybrid model's clean engine meets the U.S. Environmental Protection Agency's (EPA) Tier3 emission standards. In addition, it was designated by the Ministry of Land, Infrastructure, Transport and Tourism as an ultra low-noise construction machine, generating 6dB less noise than low-noise machines. All in all, the HB205-1 boasts dramatically improved environmental performance with regard to emissions, fuel efficiency and noise.



HB205-1 hybrid hydraulic excavator

Full Model Change for the WA1200 Super-large Wheel Loader

The WA1200-6, the world's largest mechanical wheel loader, is equipped with an advanced Komatsu engine. Its multi-faceted exhaust emission control system has reduced emission levels of nitrogen oxides (NO_x), hydrocarbons (HC), carbon monoxide (CO), and other harmful substances. In addition, fuel efficiency has been improved by 15% (comparing to conventional equipment), by incorporating control features such as controlling discharge rate of the pump or the flow to the hydraulic circuit dependent on the load onto the equipment.



WA1200-6 wheel loader

Thermoelectric Modules

Thermoelectric modules are devices that take advantage of the Seebeck effect – two dissimilar metals are connected, causing a temperature difference at the connection point and current flow between the two metals. Marketing of these devices has started through KELK Ltd.

Komatsu had undergone a total of approximately 6,000 hours of verification testing with the heat-treating furnace at



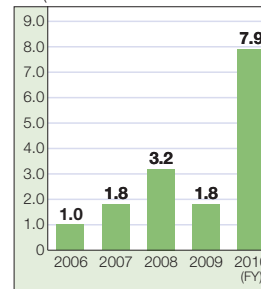
Verification test of the heat-treating furnace at the Awazu Plant

the Awazu Plant until January 2011, and is now using the recovered energy for indoor lighting of the plant. If waste heat recovery from plants is widely adopted (50% adoption) in Japan, it will bring about a reduction in CO₂ emissions of 1 million tons (Electric conversion: 2.9×10^9 kWh) annually.

Wire Saws for Solar Cells

Mainstream solar cells are made from thinly sliced silicon wafers. These wafers are manufactured by a machine known as a multi-wire saw, which achieves high precision cutting using a wire moving at high speed. The expansion of solar energy generation has led to an increase in Komatsu NTC's sales of wire saws. The advanced technology contributes to the production and quality of solar cells, and at the same time to the reduction of CO₂ emissions worldwide.

Wire saw sales rate trend (as the rate is 1.0 in FY2006)

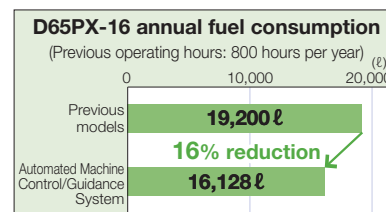


Wire saw for cutting solar cell wafers

Automated Machine Control/Guidance System

An Automated Machine Control/Guidance System refers to a construction system designed to improve the productivity of the overall construction process and ensure quality. This is achieved by applying Information and Communication Technology (ICT) to a series of processes, consisting of surveying, design, construction, supervision, and inspection and maintenance. Equipping construction machines with the Automated Machine Control/Guidance System makes it possible to compare the position information of the machine with three-dimensional design data to support operation of the machine by the operator or to automatically control the machine. Incorporating these features greatly reduces the need for guides and surveying work during construction. It also reduces subsequent corrections, thereby shortening construction periods, improving the operation rates of the construction equipment, and reducing CO₂ emissions. Calculations based on internal test results have shown that the use of one D65PX-16 medium-sized bulldozer will reduce CO₂ emissions by 7.9 tons per year, or in terms of fuel, will help save 15 drums of fuel. After having already made inroads in Japan, the U.S.A. and Europe, Komatsu is currently promoting the system on a global scale.

Example of fuel consumption reduction effect by Automated Machine Control/Guidance System



*Effect of the Automated Machine Control/Guidance System on Reducing CO₂ Emissions (effect not guaranteed)



Training on the Automated Machine Control/Guidance System (China)

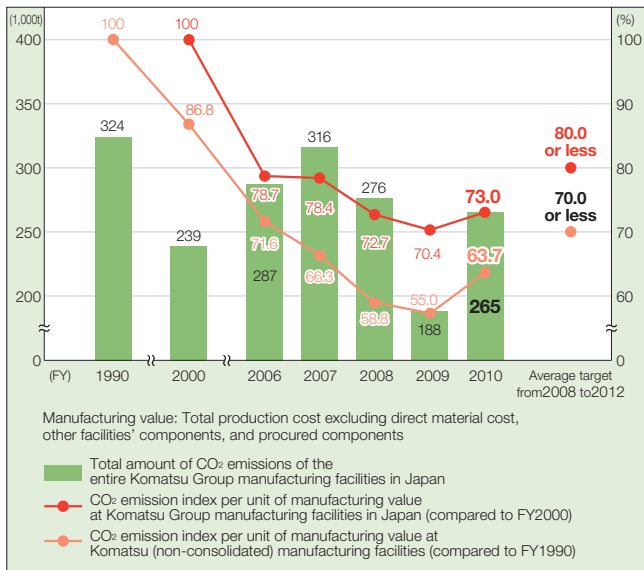
Initiatives to Mitigate Climate Change in Business Operations

Reducing CO₂ Emissions in Manufacturing Operations

As part of its efforts to mitigate climate change, Komatsu has adopted an indicator of CO₂ emissions per unit of manufacturing value with respect to the electricity, fuel gas, fuel oil, and any other type of energy used in the manufacturing operations. The Company has set a target of 20% reduction in CO₂ emissions by FY2010, compared to the FY2000 level.

In 2010, the increased use of energy for air-conditioning during the heat wave aggravated the situation, but the company succeeded in achieving its medium-term target for the fifth year in a row.

◆ CO₂ Emissions



◆ Main Initiatives in the Manufacturing Division

Side	Initiatives
Demand side	Upgrading from old production lines to high-efficiency production lines Strict enforcement of cutting power to equipment not in operation Refining drying processes (shift to low-pressure air blowers) Introducing inverter-controlled pumps and motors Adopting high-efficiency lighting to a greater extent
Supply side	Using high-efficiency heat pumps in air conditioning systems Renewing transformers to amorphous transformers Using power saving control of engine-generators, etc. (Minimum CO ₂ Operation)

Komatsu Castex's New Iron Foundry Facility

Komatsu Castex Ltd. is in charge of the Komatsu Group's foundry division. Iron foundry operations account for about 30% of the CO₂ generated by the Group, because of the high heat requirements.

Komatsu Castex Ltd. constructed the new iron foundry facility at the Himi Plant and transferred iron foundry operations from the Oyama Plant. Komatsu Castex is now capable of efficient operation. At the new iron foundry facility, the latest high-frequency melting furnace (IGBT control) was adopted.

50% of the CO₂ related to foundry is generated in the melting process. Using the new melting furnace, CO₂ emissions is reduced approximately 16% per weight in the melting process.

Reducing CO₂ Emissions in Logistics

● Improving Load Efficiency by Increasing Shipped Unit Size to Large Lots

Transport efficiency was improved by dense loading of large-size containers. The reduced number of transport runs resulted in a reduction of CO₂ emissions through the use of logistics. In addition, the use of returnable pallets contributed to the conservation of resources.



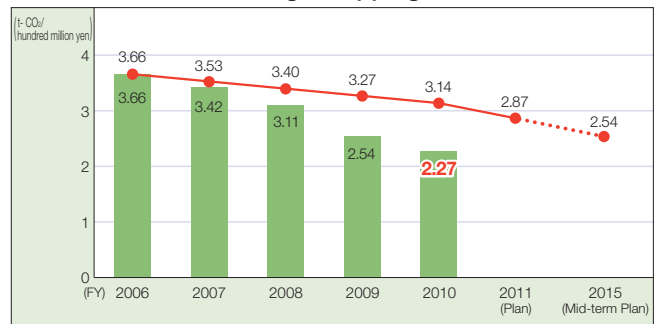
Loading engines into containers
(Example: PC200 bound for China: load efficiency 98.8%)

● Using Nearby Ports to Shorten Shipping Distances

Shipping distances were shortened by transferring production to the Ibaraki and Kanazawa Plants, both adjacent to ports.

- (1) The Kanazawa Plant "Shipping distance per unit" 193 km/unit → 56 km/unit (71% of improvement)
- (2) The Awazu Plant raised its utilization rate of the Kanazawa Port for component shipments by 11.4%. (Utilization rate of the Kanazawa Port raised from 80.9% to 92.4%)
- (3) Transferring production of industrial machinery to the Kanazawa Plant resulted in a reduction of CO₂ emissions equivalent to 422 tons per year.

◆ Targeted and Actual CO₂ Emissions per Unit of Net Sales Generated though Shipping



Reducing CO₂ Emissions in the Non-manufacturing Divisions

With the revision of the Act on the Rational Use of Energy, all Komatsu business units are assessing CO₂ emissions in an effort to achieve reductions. The energy consumption of non-manufacturing divisions, including the Head Office building, the Research Division, and the Field Testing Department, is shown in the table below. Komatsu is proactively moving forward by assessing and reducing CO₂ emissions. These efforts are not limited to Komatsu alone, but are expanding to include the entire supply chain, from business associates to sales agencies and rental companies.

◆ Energy Consumption of Non-manufacturing Divisions (FY2010)

	Komatsu		Main partner companies	Main sales and after-sales services divisions	
	Production (for reference)	Non-manufacturing		Sales of construction equipment	Rental
CO ₂ (1,000 tons)	169.2	8.3	118.7	5.1	2.7
Crude oil equivalent (1,000 kL)	93.0	4.5	62.8	3.0	1.7