Green Factories
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Energy Conservation

Increased energy consumption has an impact on environmental issues such as climate change. It is now a common practice for corporations to implement limited energy levels more effectively to complete their industrial activities. Kyocera began its energy conservation measures in FY1993 with the goal of reducing energy consumption. In FY2011, as the Act on the Rational Use of Energy (Energy Conservation Act) was revised and went into effect, we promoted the review of energy managerial standards and the strengthening of energy conservation measures at facilities which consume large amounts of energy in Japan.

FY2011 Results

Reduced electricity consumption

The Kyocera Group enacted energy saving measures such as installing high-efficiency equipment and using inverters in pumps and fans. However, as a result of acquiring a new business unit, the Kyocera Group’s electricity consumption increased by 18.4% as compared with FY2010. Meanwhile, electricity consumption per net sales increased by only 0.3% from FY2010.

Reduced fuel consumption

The Kyocera Group implemented energy saving measures such as installing high-efficiency heat pumps, enhancing waste heat recovery and improving the insulation of calciners and buildings. However, the Kyocera Group’s fuel consumption increased by 20.4% from FY2010 due to the acquisition of new business units. Meanwhile, the electricity consumption per net sales increased by 4.0% from FY2010.

Examples of Energy Saving Measures

■ Introduction of compressor quantity control system (Kagoshima Kokubu Plant)

We developed a compressor quantity control system in-house and introduced it at the Kagoshima Kokubu Plant. In addition to reducing wasted power at the time of unloading, this system also contributes to reduced set pressure and early detection of malfunction by making it easy to see wattage and pressure.

■ Power saving in powder conveying blower (Tamaki Plant, Kyocera Mita Japan Corp.)

The Kyocera Mita Japan Corp. Tamaki Plant replaced the powder conveying turbo blowers in the toner manufacturing line with energy efficient roots blowers. We are also striving to reduce power consumption further by switching the air volume control from control by damper to controlling the number of revolutions by inverter.

Notes

* Integrated certification: Sites collectively certified under the Kyocera Group Integrated Environmental Management System except KYOCERA Corporation (refer to page 88)
** Others: Except KYOCERA Corporation and integrated certified sites.

Please refer to environmental impact data for individual sites on our Web site: http://global.kyocera.com/ecology/
Climate Change Prevention

The Kyocera Group set a greenhouse gas reduction target and is implementing various measures, including energy savings, to prevent climate change.

**FY2011 Results**

The Kyocera Group took energy saving measures and implemented ways to prevent climate change, including the introduction of a solar power generating system and fuel conversion. However, as a result of acquiring a new business unit, the Kyocera Group’s greenhouse gas emissions increased by 12.4% as compared with FY2010. Meanwhile, the greenhouse gas emissions per net sales decreased by 4.8% from FY2010.

Kyocera’s greenhouse gas emissions were reduced by 30.2% as compared with per net sales in FY1991. Meanwhile, the greenhouse gas emissions increased from FY1991 by 39.2% due to new production sites and other factors.

Kyocera’s emission of gases, such as PFCs, were significantly reduced by 90.6% in total, due to continuous minimization efforts such as switching to substances with low climate change potential and installing scrubbers, as compared with FY1996. We will continue to actively promote energy saving activities and strive to enable the coexistence of economic and environmental interests while contributing to the prevention of climate change.

### Greenhouse Gas Emissions

<table>
<thead>
<tr>
<th>Year</th>
<th>emissions (Kyocera)</th>
<th>emissions (Integrated certification)**1</th>
<th>emissions (others)**1</th>
<th>per net sales (Kyocera)</th>
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<td>912</td>
<td>817</td>
<td>917</td>
<td>911</td>
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</table>

* From FY2009, emission coefficients are calculated based on the Act on Promotion of Global Warming Countermeasures.
* Greenhouse gas emissions are calculated by adding CO2 emissions and PFC gas emissions that arise from fuel consumption. However, greenhouse gas emissions in FY1991 were calculated by adding CO2 emissions of FY1991 and PFC gas emissions of FY1996.
* Figures for overseas facilities are calculated using the PFC gas emissions of FY1996.

### Energetic Origin CO2 Emissions

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<th>Year</th>
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<th>emissions (others)**1</th>
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<th>per net sales (Kyocera Group)</th>
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<td>641</td>
<td>461</td>
<td>927</td>
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</table>

### Examples of Efforts to Prevent Climate Change

#### Introduction of high-efficiency heat pumps

(Shiga Gamo Plant / Shiga Yohkaichi Plant)

The Shiga Gamo Plant and Shiga Yohkaichi Plant replaced absorption chillers, which run on heavy oil, with heat pump systems which run on energy efficient electricity. The effects of carbon dioxide emission reduction due to this measure will be about 581 ton-CO2 annually.

#### Fuel conversion (Dongguan Shilong KYOCERA Optics Co., Ltd. / KYOCERA Mita Office Equipment (Dongguan) Co., Ltd.)

Dongguan Shilong KYOCERA Optics Co., Ltd. and KYOCERA Mita Office Equipment (Dongguan) Co., Ltd., our production sites in China, switched the fuel used for cooking in the cafeteria and water heaters from diesel fuel to natural gas. The effects of carbon dioxide emission reduction from this conversion will be about 403 ton-CO2 annually.
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■ Measures at Kagoshima Sendai Plant
The Kagoshima Sendai Plant has implemented measures such as “Green Curtains” and an internal “Eco-Drive” contest, in addition to energy saving measures such as switching from steam humidifiers in the clean room to energy efficient water spray humidifiers.

[Main Measures]
- Heat source: Improved the operation efficiency of turbo-refrigerators.
- Air conditioner: Improved the humidifying method in the clean room.
- Pump: Reduction of conveyance power by inverter control.
- Power receiving / transforming facilities: Consolidated transformers.
- Building: Reduction of air conditioning load using thermal barrier paint on the roof.
- Other: Introduction of solar power generating system.
- Growing “Green Curtains”
- Promotion of “Eco-Drive”

■ Solar cell production process
(Shiga Yohkaichi Plant)
The Shiga Yohkaichi Plant implemented energy saving measures in its solar cell production process, such as a cold and hot water supply with a high efficiency heat source by integrating heat sources between plants, introduction of free cooling and use of waste heat from compressors to preheat water for purification.

[Main Measures]
- Heat source: Integration of heat source system.
- Introduction of free cooling.
- Air compressor: Power saving by quantity control.
- Fan: Improved operational control of ventilating fans.

■ Introduction of Solar Power Generating Systems
The Kyocera Group introduced solar power generating systems in various locations in and outside Japan, such as at the global Kyocera Headquarters building in Kyoto and at Kyocera International Inc. — Kyocera’s North American holding company.
In FY2011, we introduced solar power generating systems with a total of 836kW at 9 locations in and outside Japan, thus exceeding 2MW in total for all solar power generating systems introduced within Kyocera Group companies in and outside Japan. Carbon dioxide emission reduction due to these installations will be about 968 ton-CO₂ annually. Furthermore, Kyocera has installed solar power generating systems at all of its 10 manufacturing plants in Japan. Kyocera will continue to promote CO₂ emissions reduction in its business activities by actively introducing solar power at its Group company facilities.

Overseas locations

KYOCERA Mexico, S.A. de C.V.
Generation capacity: 100kW
KYOCERA (Tianjin) Solar Energy Co., Ltd.
Generation capacity: 93kW
KYOCERA Mexicana, S.A. de C.V.
Generation capacity: 115kW
KYOCERA (Tianjin) Solar Energy Co., Ltd.
Generation capacity: 93kW
KYOCERA is an energy company.
Generation capacity: 90kW
Generation capacity: 141kW
Generation capacity: 158kW
Generation capacity: 50kW
Generation capacity: 53kW
Generation capacity: 36kW
Generation capacity: 115kW
Generation capacity: 51kW

Introduction of Solar Power Generating Systems

Kyocera Mita Japan Corp. Tamaki Plant
Generation capacity: 100kW
Shiga Gamo Plant
Generation capacity: 141kW
Shiga Yasu Plant
Generation capacity: 90kW
Nagano Okaya Plant
Generation capacity: 51kW
Kagoshima Sendai Plant
Generation capacity: 51kW
Kyoei Ueda Japan Corp. Tenri Plant
Generation capacity: 51kW
Hokkaido Kitami Plant
Generation capacity: 115kW
Fukushima Tanagura Plant
Generation capacity: 36kW

………. Introductions in FY2011 ………..
Promotion of modal shift

The Kyocera Group is promoting eco-friendly distribution in and outside of Japan. Shanghai KYOCERA Electronics Co., Ltd., a manufacturing plant in China, which previously used air cargo to transport products to Hong Kong, switched the transportation of part of its products from air to truck in January 2009. In October 2010, it further switched to railway, reducing CO₂ emissions during transportation. We will continue to increase the use of transportation methods that cause less of an environmental burden, such as railway, to reduce CO₂ emissions arising from transportation of goods.

Example overseas (Shanghai KYOCERA Electronics Co., Ltd.)

CO₂ emissions have been reduced by 97% compared to previous transportation methods.

Clean Energy Use

KYOCERA MITA Europe B.V., KYOCERA MITA Belgium N.V. and KYOCERA MITA Deutschland GmbH, Kyocera Mitap Corporation’s sales companies in Europe, use clean energy generated by hydraulic power or wind power in their offices. Shanghai KYOCERA Electronics Co., Ltd., a manufacturing plant in China, has been using clean energy generated by wind power every year since 2006. This use of green power together is equivalent to a reduction of annual CO₂ emissions of approximately 1,260 tons.

Growing “Green Curtains”

The “Green Curtain” activity refers to covering windows by growing climbing plants such as bitter gourd and morning glory. It not only prevents room and outside surface temperatures of buildings from rising by blocking the strong summer sunshine, but also helps to cool down room temperature via foliage transpiration. The Kyocera Group grew Green Curtains at 18 plants and offices in Japan and two locations overseas in FY2011. The total mass of Green Curtains grown by the Kyocera Group in FY2011 accounts for a length of 616 meters and an area of about 2,479m², or about the equivalent area of 9.6 tennis courts.

CO₂ Emissions Reduction in Distribution

In FY2011, we implemented measures such as a continuous effort for modal shift and a review to shorten transportation distances. However, as an expansion in orders resulted in increased freight shipping, the CO₂ emissions from freight transportation in FY2011 increased from FY2010 by 40.2%. Meanwhile, the CO₂ emissions per net sales increased by only 0.9% from FY2010.

* Reduction of CO₂ emissions is calculated using the emission coefficients of electricity for each country in IEA CO₂ EMISSIONS FROM FUEL COMBUSTION Highlights (2010 Edition).
Waste Reduction and Recycling Measures

To contribute to a recycling-based society, Kyocera started its activities for industrial waste reduction with a basic policy in FY1992. Since FY2009, Kyocera has been working to reduce waste while updating part of the previous basic policy.

Basic Policy for Waste Reduction

1. Do not bring in non-recyclable materials.
2. Minimize waste generated by business activities.
3. Recycle waste once it is generated.

FY2011 Results

Reducing industrial waste discharge

The Kyocera Group’s plants worked on the reduction of wastewater produced in the manufacturing process of solar power generating systems in Japan and the reduction of sludge produced by the injection control of wastewater treatment agents. At overseas sites, we promoted turning waste into valuables. At offices, we implemented waste reduction measures such as turning office fixtures and plastic waste into valuables. Although the industrial waste discharge increased by 4.4% compared to FY2010 due to an increase in production, it decreased by 11.5% on a per net sales basis.

Examples of Reduction in Industrial Waste Discharge

- **Reduction of industrial waste associated with the production of solar power generating systems (Shiga Yohkaichi Plant)**
  Waste acid and waste alkali produced in the surface treatment process of solar power generating systems are treated in wastewater treatment facilities. We have reduced the amount of wastewater produced by reviewing the process and extending the life of chemical solutions. We also reduced about 227 tons of sludge annually by reducing wastewater treatment agents through wastewater reduction and controlling the injection of agents by installing flow meters.

- **Reduction via recycling of used waste oil (Shiga Gamo Plant)**
  We previously treated waste oil produced in the abrasive process of sapphire as industrial waste because of its high water content. However, it can now be turned into a valuable resource as recycled fuel by recycling the oil content at a heavy oil recycler, thus reducing 28.8 tons of waste annually.

- **Turning glass and packing waste into valuables (Dongguan Shilong Optics Co., Ltd.)**
  Previously, glass and packing were treated as industrial waste before, however, strictly separating the waste allowed us to turn it into valuables. As a result, we have recycled about 11 tons of waste as valuables annually.

- **Turning styrofoam into valuables by compacting it (KYOCERA Mexicana, S.A. de C.V.)**
  We previously treated styrofoam as industrial waste, however, we have recycled about 4 tons of it annually as valuables by introducing a compactor.
The Kyocera Group (Japan) continues to reduce paper waste and general waste from offices. While the general waste discharge increased by 6.3% compared to FY2010 because of an increase in sludge generated from septic tanks, it decreased by 10.5% on a per net sales basis.

### Proper waste disposal

Thorough investigations were conducted of companies providing waste disposal services, including financial stability and on-site surveys according to the “treatment work management standard for waste,” in which proper disposal and management of waste are specified. Even after signing a contract with a waste-treatment company, field surveys of these disposal companies are conducted twice a year. In FY2011, we conducted field surveys and exchanged information with 172 companies.

### Examples of Waste Generation Reduction

- **Reduction by extending the life of wastewater containing silica (Hokkaido Kitami Plant)**
  - We reduced about 24 tons annually by reviewing the exchange operation of wastewater in an attempt to extend the life of wastewater containing silica generated in the abrasive process and filter the generated wastewater.

- **Reduction of sludge by improving wastewater treatment facilities (Nagano Okaya Plant)**
  - We reviewed the treatment method of the wastewater treatment facilities and reduced about 14.8 tons of sludge annually by improving treatment efficiency and reducing chemical injection.

- **Increased treatment capacity of the intermediate waste treatment facility (Shiga Yohkaichi Plant)**
  - The volume of sludge produced in the wastewater treatment facility, and treated in the internal intermediate treatment facility, has been reduced by approximately 420 tons annually as a result of enhancing treatment facilities and expanding the scope of substances to be subjected to treatment.

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**Notes**

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Please refer to environmental impact data for individual sites on our Web site: http://global.kyocera.com/ecology/

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**Generation [Tons]**

<table>
<thead>
<tr>
<th>Generation (Kyocera)</th>
<th>Generation (Integrated certification*1)</th>
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**Disposal [tons]**

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**Per net sales [kg/million yen]**

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<th>Per net sales (Kyocera)</th>
<th>Per net sales (Kyocera Group (Japan))</th>
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</thead>
<tbody>
<tr>
<td>4.0</td>
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</table>
Chemical Substances Management

Some chemical substances cause environmental pollution and can affect human health and the ecosystem as a result of long-term accumulation. To manage these substances, we have established a chemical substances control system to minimize the amount of toxic chemical substances released into the air, water and waste.

**FY2011 Results**

**Reduction of Class I Chemical Substances specified by PRTR Law**

The Kyocera Group (Japan) classified 21 substances which account for over 95% of the Class I Designated Chemical Substances stipulated in the PRTR Act as substances to be reduced and took steps to reduce them through replacement with substances that are not subject to the PRTR Act, and by improving the efficiency of the toluene recovery equipment. Although the consumption, emissions and transferred amount all increased compared to FY2010 due to an increase in production using the subjected substances, the transferred amount per net sales decreased by 1.4%.

**Supporting the PRTR Law**

With the revision of the PRTR Act promulgated in November 2008, the number of chemical substances designated as Class I Designated Chemical Substances for which emissions and transported amount are subject to management changed from 354 to 462 in FY2011. Within the Kyocera Group (Japan), all 51 substances including newly added designated substances have become subject to assessment and reporting with respect to emissions and transferred amount.

**Reducing Volatile Organic Compound (VOC) emissions in the air**

The Kyocera Group (Japan) took steps to reduce the four substances (toluene, IPA, acetone and methanol) that comprise more than 95% of VOC emissions in the air. Although we have implemented reduction measures such as improving the efficiency of toluene recovery equipment and improving the cleaning method, VOC emissions increased by 26.9% compared to FY2010 due to an increase in production using the subject substances.

**Examples of Chemical Substances Management**

**Reduction of acid and alkaline chemicals by improving the solar cell production process (Shiga Yohkaichi Plant)**

We reduced about 189 tons of acid and alkaline chemicals annually by reviewing the supplies of chemical solutions at the solar cell production process and the injection control of chemicals in the wastewater treatment process.

**Management and disposal of PCB waste**

The Kyocera Group (Japan) strictly controls and manages PCB (polychlorinated biphenyl) waste at specified locations with control sheets prepared in accordance with relevant laws. Kyocera has already become an early registrant for disposal of these wastes with the Japan Environmental Safety Corporation and will dispose of them accordingly.