



## Reducing CO<sub>2</sub> Emissions

As stated in "Outline of the Environmental Impact of the Supply Chain" (see page 28), the Showa Shell Sekiyu Group's CO<sub>2</sub> emissions in 2006 totaled 6.55 million tons.<sup>1</sup> The Group's oil refineries account for 84% of this. Therefore, a medium-term energy conservation master plan has been formulated, and the refineries will be continuously reducing their CO<sub>2</sub> emissions. The company is also taking a number of measures to reduce CO<sub>2</sub> emissions in transportation of crude oil and other products. In addition, Showa Shell is using the Kyoto Mechanism as a guide to its efforts to reduce CO<sub>2</sub> emissions.

\* Total CO<sub>2</sub> emissions from crude-oil transport through distribution and sale are described on pages 28 – 29.

### ❖ The Challenge: Refineries

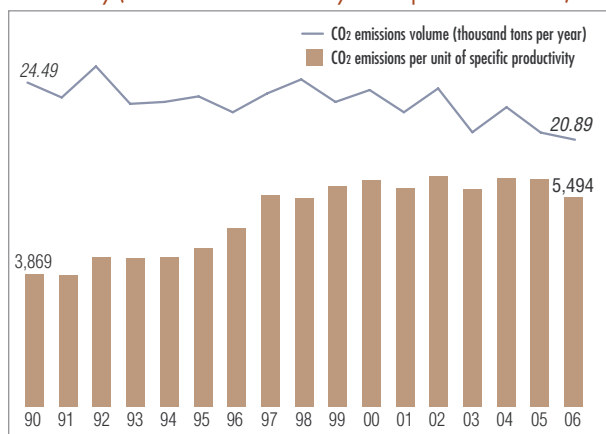
In the production of gasoline, kerosene, and other products from crude oil, oil refineries naturally consume energy and emit greenhouse gases, primarily CO<sub>2</sub>. To improve the environmental performance of its products in areas beyond CO<sub>2</sub>, the Showa Shell Sekiyu Group has fitted its oil refineries with equipment to reduce the sulfur and benzene content in its products. CO<sub>2</sub> emissions, however, are higher than their 1990 level and increasing.

Oil refineries are responding to societal demands for further reductions in the sulfur content of their products. From the standpoint of environmental protection, refineries are pursuing further energy efficiency through the installation of high efficiency equipment and machinery, waste-heat recovery systems, and systems that contribute to low-energy operation.

The Petroleum Association of Japan uses the unit energy consumption in its CO<sub>2</sub> emissions index, and Showa Shell is at the top of the industry in energy consumption per unit of specific productivity. Further, by 2006 the company had reduced its CO<sub>2</sub> emissions by 14.6% in comparison to their 1990 level (The Petroleum Association of Japan's target is a 10% reduction by 2010 compared to the 1990 level).

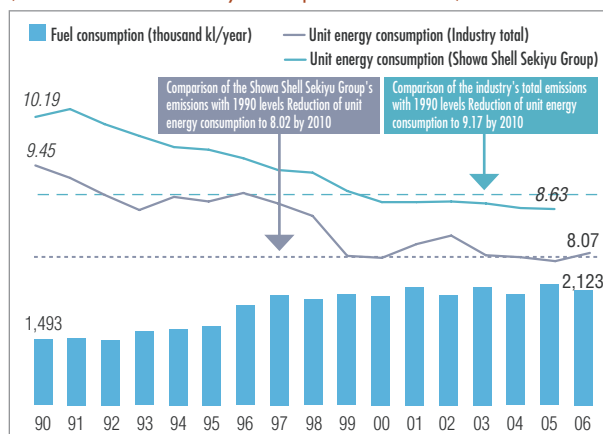
The Petroleum Association of Japan's target of a 10% cut from 1990 levels means reducing the industry average unit energy consumption to 9.17 by 2010. However, the Showa Shell Sekiyu Group will continue its energy conservation measures, and has set itself a goal of reducing its unit energy consumption to 8.02 by 2010 (reflecting a reduction of 15% below 1990 levels).

CO<sub>2</sub> Emissions Volume and CO<sub>2</sub> Emissions per Unit of Specific Productivity (At the Showa Shell Sekiyu Group's Oil Refineries)



CO<sub>2</sub> emissions per unit of specific productivity: CO<sub>2</sub> emissions volume (thousand tons)/equivalent feedstock volume (thousand kl)

Fuel Consumption and Unit Energy Consumption (At the Showa Shell Sekiyu Group's Oil Refineries)



Unit energy consumption: Energy consumption (kl)/equivalent feedstock volume (thousand kl)



## ❖ The Challenge: Transportation

### Responding to the Revision of Japan's Law Concerning the Rational Use of Energy

A revision to Japan's Law Concerning the Rational Use of Energy took effect in April 2006. One purpose of the revision is to ensure that those who emit CO<sub>2</sub> from the use of energy ascertain the volume of emissions themselves and establish voluntary reduction measures.

In addition, the revised law imposes a duty to conserve energy on the transportation industry. Shippers must submit planning documents and periodic reports to the competent minister, and must take measures to reduce their energy consumption.

In April 2007 Showa Shell reported shipping in 2006 of 7,120 million ton kilometers, which makes it a designated shipper under the revised law. The company therefore has initiated measures to reduce energy consumption in transportation.

### Measures related to Overland Shipping

#### ■ Operation of Large Tank Trucks

The ratio of large trucks with a capacity of 20 kl or more has increased from 52% in 1995 to 72% in 2006. The adoption of ultra-large trucks with a capacity of 24 kl or more is a significant factor in this increase, and 74 more were brought into operation in 2006. Orders from service stations and factories are handled by the NEU PLANET® automatic transport system, which utilizes trucks that have the latest computer technology installed.

#### ■ Increased Night Delivery

In the past, truck drivers working alone could not unload their cargo at customers' facilities. Now, though, the installation of safety equipment on trucks and at service stations enables drivers to safely and single-handedly unload their cargo, making night deliveries at closed service stations possible.

Progress in the installation of this safety equipment has allowed Showa Shell to escape daytime road congestion and make deliveries at night, when there is little traffic. As a result, the company made deliveries at 620 service stations in 2006, primarily in the Higashi Meihan region.

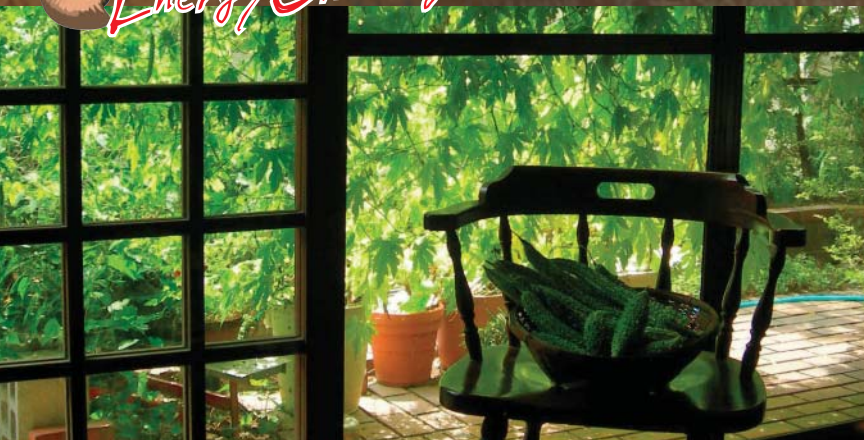
### Initiatives in Marine Transportation

#### ■ Enlarged Tanker Size

The average tanker capacity in 1995 was 2,400 kl, but steady progress in efforts to use larger ships had increased average tanker capacity to 4,024 kl by 2006. Showa Shell has worked to reduce the number and shorten the distance of transport voyages, which will curtail tanker fuel consumption through optimization of the transport plan and adjustments in response to the supply-and-demand balance.

#### ■ Electrical Propulsion Ships

In November 2007 the company will bring a 749 gross ton electrical propulsion ship into operation. Compared to earlier propulsion systems, electrical propulsion ships have the effect of reducing NO<sub>x</sub> emissions by 35% and CO<sub>2</sub> by 8%, while also reducing energy consumption. These vessels also offer improved handling, safety, and stability.



## ❖ The Challenge: Offices

Since its Eco-Summer 2005 campaign in the summer of 2005, the Showa Shell Sekiyu Group has been engaged in its ECO TRY 21 Personal Environmental Protection Program. The principle of this eco-program for office workers is to encourage employees to take what actions they can in their immediate vicinity. It is based on ten eco-principles, including the reduced use of lighting and paper, and sets targets for the working environment in each workplace that employees work toward on a voluntary basis.

In 2006 this program had the effect of reducing the Group's total electricity consumption by 4.6% and its paper consumption by 0.9%, in comparison to 2005.

Showa Shell instituted casual days (no ties, no jackets, etc.) in 1998, ahead of the government's "Cool Biz" campaign. In 2006, casual days were held from May 22

### Ten Eco-Principles (2007)

1.	Maintain room temperature at 28 °C in the summer and 20 °C in the winter.
2.	Participate in Cool Biz in the summer and Warm Biz in the winter.
3.	Use partial illumination, depending on the time and place such as turning off lights during lunch breaks and in unused meeting rooms.
4.	Expand summer leave privileges, and institute "no-overtime" days and weeks.
5.	Reduce copying, particularly color copies. Where copying is necessary, promote the use of double-sided copies to save paper.
6.	Work toward paperless operations. Reduce the use of paper documents and handouts at meetings.
7.	Keep workplaces clean and tidy.
8.	Conserve and reduce the use of stationery.
9.	Thoroughly sort all trash and garbage.
10.	Turn PC monitors off when not in use for one hour or longer.

All workplaces are adapting these principles to their circumstances and implementing them.

## ECO TRY 21

to September 30. The Group has also launched "ECO TRY for the Home" campaign to introduce employees' families to ecological issues, and has begun the installation of the wiring needed to replace area illumination with partial illumination in the Head Office. To share information on the progress of ongoing programs, the Group publishes the ECO TIMES e-zine, and has appointed eco-leaders to take a central role in the environmental activities of each workplace. These measures are designed to raise the environmental awareness of the Group's employees.

ECO TRY 21 will continue through 2007, and then be incorporated into the Medium-Term Environmental Action Plan for 2007 to 2009, which will set medium-term goals and manage progress through the plan-do-check-act (PDCA) cycle.

Volume of Electricity and Paper Consumption at the Showa Shell Sekiyu Group (2006)

