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3. Energy Conservation and Global Warming Countermeasures

The 1992 Earth Summit raised awareness of the global warming problem worldwide. A number of mechanisms and numerical targets for reducing greenhouse gas emissions were adopted for inclusion in the Kyoto Protocol at COP3 (The 3rd Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change) in 1997, held in Kyoto. At COP3, Japan made a commitment to reduce its greenhouse gas emissions between 2008 and 2012 by 6% from 1990 levels. The Kyoto Protocol took effect on February 16, 2005, after Russia's ratification fulfilled the conditions for it to enter into force.

The Prime Minister's Global Warming Prevention Headquarters unveiled its own Kyoto Protocol Target Achievement Plan in March 2005, and this was approved by the Cabinet on April 28.

Greenhouse gases—primarily CO2—are believed to be the main cause of global warming, and CO2 production is largely the result of fossil fuel consumption. Thus, efforts to combat global warming necessarily include energy conservation measures. Japan was hit hard by the 1973 "oil shock," but this served as an opportunity to promote energy conservation. The petroleum industry, including Showa Shell, contributed to these efforts by introducing improved energy-saving equipment. Showa Shell further developed its own program in response to the Petroleum Industry Global Environmental Protection Voluntary Action Plan program in 1997. This included definite deadlines and numerical targets and was a new approach to addressing the issue.

① The Petroleum Industry Global Environmental Protection Voluntary Action Plan

The Petroleum Association of Japan unveiled its Global Environmental Protection Voluntary Action Plan in February 1997, with a seventh Follow-Up Plan offered in October 2004. Other industry groups representing industries that consume considerable quantities of energy, such as the electricity, steel, and chemical industries, have similarly developed their own voluntary action plans to counter global warming. Nippon Keidanren (Japan Business Federation) has compiled these plans into its own Environmental Protection Voluntary Action Plan to present Japanese industries' efforts to counter global warming both within and outside Japan.

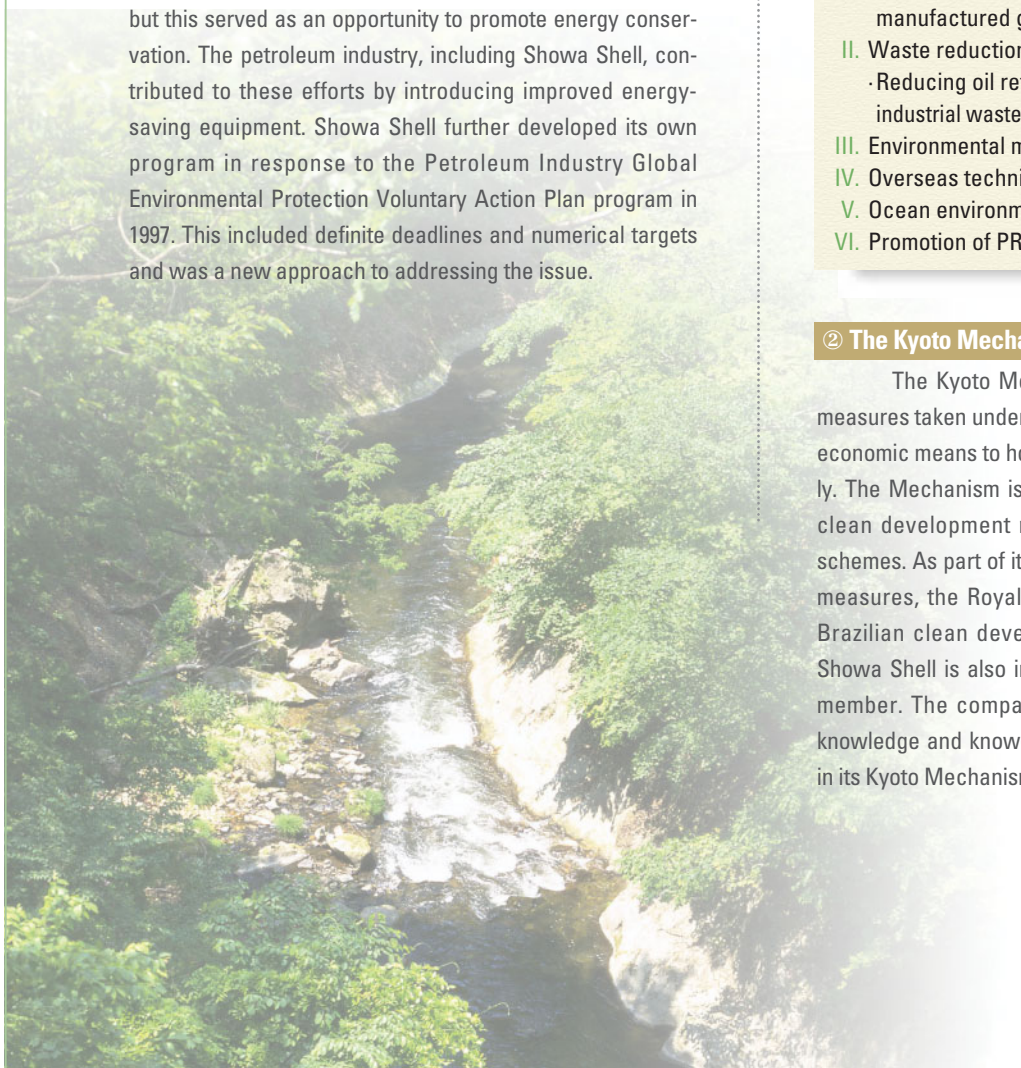
I. Global warming reduction measures (promoting energy unit consumption)
- Reducing oil refinery energy unit consumption by 10% from 1990 levels by 2010.
- Reducing fuel consumption for transport of manufactured goods by 9% from 1990 levels by 2010.

II. Waste reduction measures
- Reducing oil refinery final waste disposal of industrial waste by 67% (2/3) from 1990 levels by 2010.

III. Environmental management system development
IV. Overseas technical assistance
V. Ocean environment protection measures
VI. Promotion of PR activities

② The Kyoto Mechanism

The Kyoto Mechanism consists of a set of flexible measures taken under the Kyoto Protocol, which serve as an economic means to hold down reduction costs internationally. The Mechanism is a strategy of shared implementation, clean development mechanisms, and emissions trading schemes. As part of its greenhouse gas emissions reduction measures, the Royal Dutch/Shell Group participates in a Brazilian clean development mechanism (CDM) project. Showa Shell is also involved in related projects as a group member. The company is hoping to use its accumulated knowledge and know-how derived from group relationships in its Kyoto Mechanism activities.

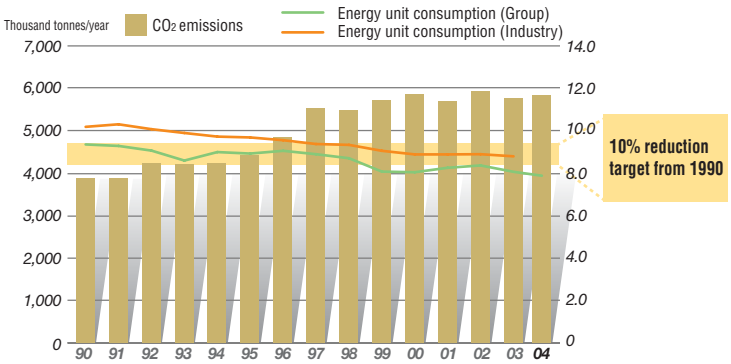


③ Energy Unit Consumption Rate and CO_2 Emissions

Showa Shell refineries, which account for approximately 85% of the Group's effluents, consume energy in the refining process and emit CO2, a greenhouse gas. Showa Shell is thus not only concerned with economic benefits, but also environmental protection in its ongoing efforts to develop more efficient petroleum refining equipment. Group refineries are always seeking to improve energy efficiency by introducing high-efficiency machinery, exhaust heat recovery equipment, and energy-conserving operation support systems. The Group's efforts to reduce energy unit consumption are improving, and the Group anticipates meeting its goal of reducing energy unit consumption by 10% from 1990 levels by 2010.

However, though Showa Shell is working to lessen the environmental impact of its products, some efforts have unfortunately resulted in increased overall energy usage and CO2 production. Upgrading the company's refinery equipment by operating desulfurization and benzene-reducing equipment for gasoline and then making products sulfur-free have resulted in increased energy unit consumption and CO2 emissions.

Group Refineries' Energy Unit Consumption and CO2 Emissions



CO2 emissions volume from an IPP facility that started operations in June 2003 have been revised using Greenhouse Gases Emissions Measurement Methods Guidelines.

Note: Energy unit consumption (%) [fuel (kl)/feedstock (Thousand kl)]
Crude oil equivalent of energy fuel (fuel oil, fuel gas and electricity) consumed in a refinery to process 1,000 kl of feedstock. Indicates efficiency of energy use; lower figures indicate higher efficiency.

4. Environmental Pollution Reduction Measures

The petroleum industry learned from the environmental problems that arose during its period of high growth and has since implemented a number of environmental protection measures at its refineries. Showa Shell has aggressively increased capital expenditures at its refineries with environmental considerations in mind. It has added new pollution control equipment, including flue gas denitration, dust separator, and drainage treatment facilities in order to reduce the amount of environmentally polluting emissions produced by its oil refineries. The company intends to continue its aggressive efforts in this area by using fuels that do not contain atmospheric pollutants and raising its overall pollutant removal technology, including by improving such facilities.

① The Petroleum

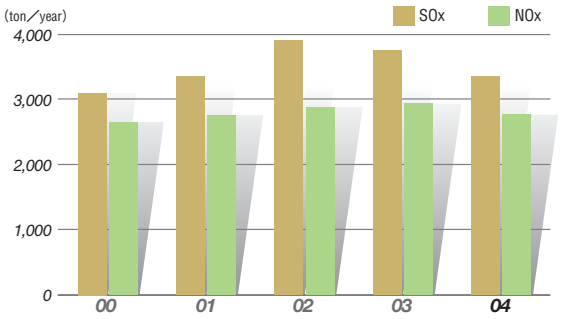
Sulfur oxides (SOx)

SOx are produced by fuel oils and gases in refinery furnaces and boilers. Showa Shell has been able to maintain SOx emissions at below regulation levels by using low-sulfur fuel oil and sulfur-free clean fuel gas. The sulfur content is removed using gas-cleaning equipment.

Nitrogen oxide (NOx)

Showa Shell is implementing measures for removal of nitrogen oxides (NOx), which are produced from flue gases by furnaces and boilers. Improved combustion methods, such as new low-NOx burners and flue gas denitration equipment, reduce the amount of NOx produced. The company is further controlling atmospheric pollution by introducing electric dust collection equipment.

Atmospheric Pollutant Emissions Volumes *(Total, Group refineries)*



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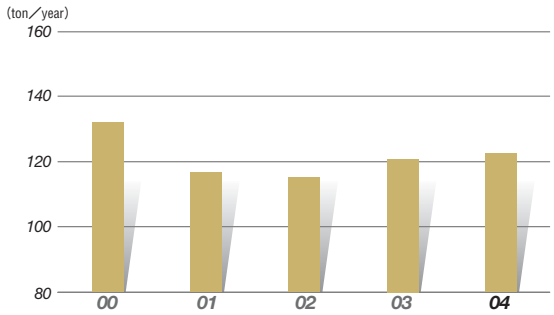
4. Environmental Pollution Reduction Measures (continued)

② Water Pollution Countermeasures

Refineries discharge coolant water and effluents used in all processes. After a check for pollutants, coolant water is discharged into the sea. Processed effluents that require treatment are cleaned through chemical treatment using oil separator flocculating agents, activated sludge treatment, or activated charcoal treatment. All effluents are confirmed to pass COD* environmental regulation values, including oil content values.

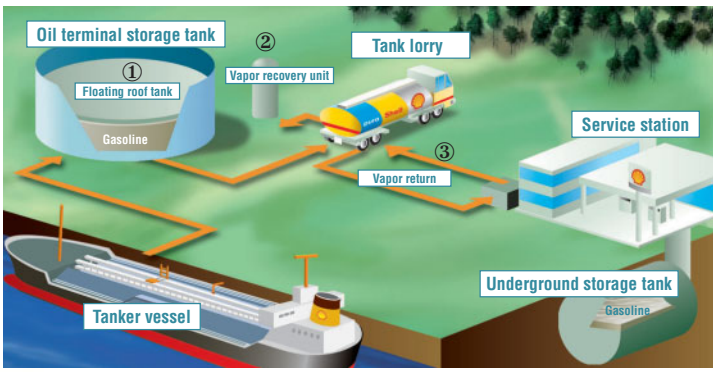
Effluent COD Loading Volumes



*** COD (Chemical Oxygen Demand)**
An index showing the degree of water pollution. Shown by the amount of oxygen required to degrade organic materials, such as sludge, in water.

③ VOC Emissions Control Measures

The Air Pollution Control Law was revised in May 2004, and new emissions regulations concerning Volatile Organic Compounds (VOC) were implemented. VOCs are thought to be a causative agent of oxidants and suspended particulate matter (SPM), which make achieving atmospheric environmental standards difficult. VOCs may be emitted into the atmosphere from fixed roof tanks for benzenes such as gasoline, or while loading tank lorry. Showa Shell is taking measures to minimize such release by replacing fixed roof tanks with floating roof tanks and introducing vapor recovery equipment to its loading facilities. The company continues to examine other means of reducing VOCs.



① Floating roof tank. (Minimizes gasoline loss through evaporation with a floating-type roof that rests directly on the liquid's surface. In fixed roof tanks, evaporation occurs in the air space between the surface of the liquid and the roof.)
② Vapor recovery system for loading machinery (Recovery equipment using liquid to absorb vaporized gas emitted when loading tank lorry or tankers)
③ Vapor return system at service station (A system to return vapors containing gasoline leaked while unloading gasoline from tank lorry to service station underground tanks)

5. Industrial Waste and Recycling Measures

① From Waste Generation to Disposal and Recycling

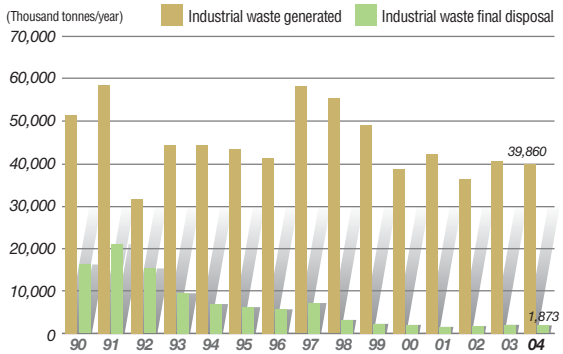
Industrial waste disposal has become a nationwide environmental issue, as space for waste disposal, including land reclamation sites, is becoming scarcer. The oil refining process generates industrial waste such as oil sludge, storage tank sludge, and spent catalysts and construction wastes from maintenance work, and the petroleum industry faces a challenge in disposing of such wastes.

Showa Shell is endeavoring to reduce its waste production volume on-site as much as possible. Beyond that, specialist contractors are called in for further reduction. Recyclable waste, such as cement components, are used as much as possible in an effort to minimize volumes sent to final waste disposal sites such as reclaimed land.

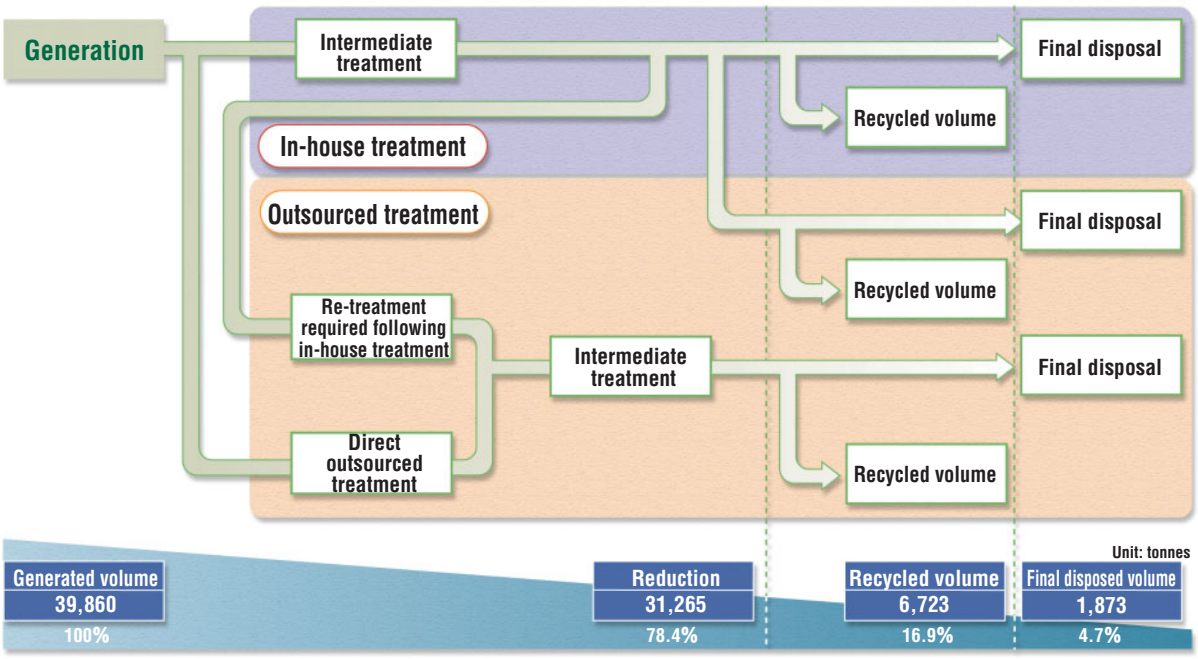
Group refineries generated a total of 40,000 tonnes of industrial waste in 2004. Of that, 78% (31,000 tonnes) was reduced in volume on-site and off-site through intermediate treatment. Seventeen percent (6,700 tonnes) was recycled, and 4.7% (nearly 2,000 tonnes) was disposed of at reclaimed land and through other means.

The petroleum industry has set a target to reduce the amount of final disposals by 67%, or two-thirds, from 1990 levels by 2010. Showa Shell has already reduced its final disposal volume by approximately 88% from 1990 levels (16,000 tonnes) and continues to work to further reduce that amount.

Industrial Waste Volume Generated / Final Waste Disposal Volumes



Showa Shell Industrial Waste Treatment Flowchart (2004)



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5. Industrial Waste and Recycling Measures (continued)

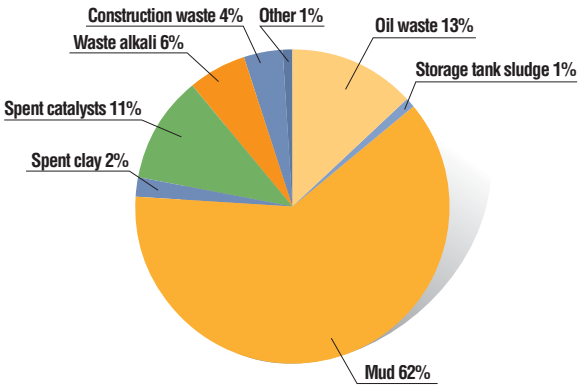
② Efforts to Reduce Industrial Waste

In 2000, the Law for Promotion of Effective Utilization of Resources replaced the Law for the Promotion of Utilization of Recycled Resources. The change was made based on the necessity of not only reducing the amount of final waste disposed, but also reducing waste generation through the efficient use of resources.

Showa Shell has established a company-wide management system by implementing waste management regulations and is leading efforts for the disposal and recycling of waste products.

Showa Shell is working to minimize the volume of final wastes through such means as intermediate dehydration treatment of sludge, reusing spent catalysts as cement components, and recycling used oil and acid. With illegal waste disposal becoming a larger social issue, Showa Shell has taken renewed steps to ensure that its operational sites always utilize industrial waste management charts (manifests) and monitor final disposal sites.

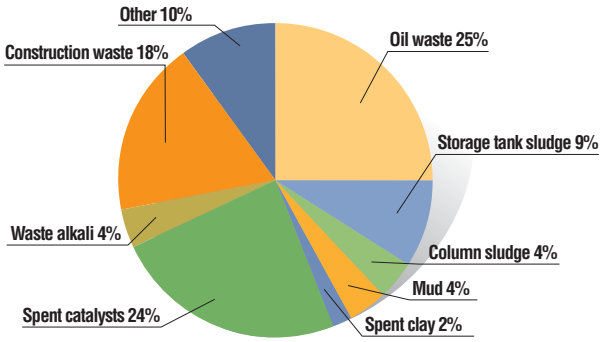
■ *Breakdown of Group Refinery Industrial Waste (2004 total volume: 39,860 tonnes)*



● Industrial Waste Production Volume

Oil waste generated during the refining process and mud and sludge from effluent treatment account for the bulk of petroleum industry waste. Oil waste is recycled as feedstock where possible, and mud and sludge are compressed by dehydration and drying. Wastes that cannot be reduced through intermediate treatment are converted to usable resources and may be recycled as cement components.

■ *Breakdown of Final Disposal of Industrial Waste from Group Refineries (2004 total volume: 1,873 tonnes)*



● Volume of Final Disposal of Industrial Waste

Industrial wastes that can be neither reduced by intermediate treatment nor recycled are disposed of at incinerators or landfills. The above graph explains the amount and breakdown of those wastes. Showa Shell is examining and assessing further means of recycling these waste products.

③ PCB Wastes

PCBs (polychlorinated biphenyls) were used for electrical appliances and other goods because of their chemical stability and electrical insulation properties. However, the manufacture, use and import of PCBs were banned in 1974 due to their high biotoxicity.

Electrical appliances containing PCBs at operational sites no longer in use are now strictly required to be stored as specially-controlled industrial wastes. Showa Shell's facilities, including its refineries, have storage sites for equipment containing PCBs. They are stored and managed in accordance with the 2001 Special Measures Law Concerning the Promotion of Proper Handling of PCB Wastes, and the required reports have been filed. The equipment will be disposed of by 2016, as required by the law.

6. Management of Chemical Substances

① Management in Accordance with the PRTR Law

The Pollutant Release and Transfer Register Law (PRTR Law) was drafted in 1999 and took effect in April 2001. The Law requires quantification of specified chemicals emitted into the environment and improved handling of such emissions. The Law aims to get businesses handling such hazardous chemicals to control emissions voluntarily by reporting quantified volume figures publicly.

Benzene, toluene, and xylene are designated as hazardous substances under the Law. These chemicals are found in gasoline at refineries, depots, and service stations and are often discharged into the air when gasoline is transferred to a tank or tank lorry or a marine tanker. However, improvements in tank and filling equipment have resulted in reduced emissions into the air, and the company is striving to further reduce such emissions.

Discharged Quantities of PRTR-Designated Substances (Showa Shell Group total, 2004)

Unit: tonnes

Item number by law	Substance group	Amount handled	Discharged/transferred volume				Removed/disposed amount	Recycled volume	Consumed volume
			Atmospheric emissions	Effluents	Transferred wastes	Total			
1	Water soluble zinc compounds	1.4	0.0	1.4	0.0	1.4	0.0	0.0	0.0
16	2-ethanolamine	4.3	0.0	0.0	0.0	0.0	4.3	0.0	0.0
40	Ethylbenzene	117,345.8	2.5	0.0	0.0	2.5	0.0	0.0	117,345.8
63	Xylene	555,869.1	10.5	0.0	0.0	10.5	0.0	0.0	55,858.6
100	Cobalt and its compounds	5.1	0.0	0.0	0.0	0.0	0.0	5.1	0.0
114	Cyclohexylamine	4.4	0.0	0.0	0.0	0.0	4.4	0.0	0.0
200	Tetrachloroethylene	59.7	0.0	0.0	0.0	0.0	29.3	0.0	30.4
224	1,3,5-trimethylbenzene	73,171.8	0.3	0.0	0.0	0.3	0.0	0.0	73,171.5
227	Toluene	478,625.9	40.1	0.0	0.0	40.1	12.3	0.0	478,573.5
232	Nickel compounds	41.4	0.0	0.0	1.7	1.7	0.0	39.7	0.0
253	Hydrazine	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
299	Benzene	142,890.2	9.9	0.5	0.0	10.4	0.0	0.0	142,879.8
346	Molybdenum and its compounds	133.7	0.0	0.0	0.0	0.0	0.0	133.7	0.0

Note 1: Figures are rounded to the first decimal place.
Note 2: Survey conducted at (operational sites): Toa Oil, Showa Yokkaichi Sekiyu, Seibu Oil, Kobe Blending Plants, Niigata Oil Products Import Terminal, Higashi-Ogishima Oil Terminal, Central Laboratory, and depots (8 Showa Shell depots, 9 JONET depots)

② Material Safety Data Sheets (MSDS)

When transferring a product containing chemical substances, the transferor is required to provide information on the properties, characteristics, and hazardous nature of the substance, as well as handling precautions. MSDS record all such information.

Showa Shell prepares MSDS for its products and provides them as necessary. Customers use them for the safe handling of petroleum products.

③ Guidelines for Animal Testing

The safety of chemical substances found in products must be ascertained fully. In some cases, the law requires animal testing to be conducted to check product toxicity. Showa Shell has formulated its own Guidelines for Animal Testing that, for example, prohibit the use of excessive numbers of animals for testing. These guidelines are based on the Animal Testing Guidelines put forth by the Royal Dutch/Shell Group.