Pollutant Control, Waste Management, Soil Preservation, and Other Activities

Cosmo Oil works to reduce its environmental impact by properly controlling pollutants and minimizing and recycling industrial waste.

Pollutant Control and Waste Management

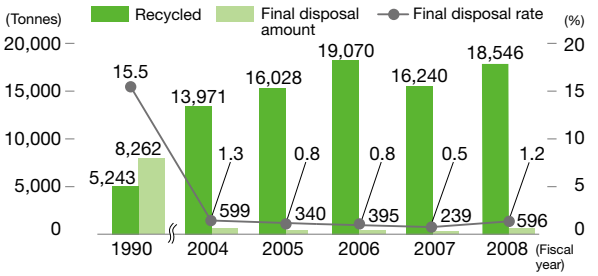
Policy

The Cosmo Oil Group has set maximum permissible levels for gas emissions and wastewater, which are more stringent than those designated by laws and regulations, as part of its strict standards for preventative measures. The Group has also set voluntary targets related to industrial waste and is making efforts to reduce waste volume and recycle the waste it generates.

Striving to Achieve Zero Industrial Waste

In fiscal 2008, the amount of waste sent for final disposal from Cosmo Oil totaled 598 tonnes, for a final disposal rate of 1.0%. The amount of waste sent for final disposal at refineries (excluding Yokkaichi Kasumi Power Station, oil depots, and the Research and Development Center) was 596 tonnes, a 93% reduction from fiscal 1990 and a 1.2% final disposal rate.

Volume of Industrial Waste at Four Refineries



Reducing Excess Sludge

Excess sludge discharged from wastewater treatment facilities accounts for the largest portion of all industrial waste in Japan. Sludge also makes up 58% of industrial waste generated at Cosmo Oil's refineries, which makes managing this sludge extremely important. To date, the Group has conducted research[1] into technologies for reducing excess sludge generated at refineries and has achieved large reductions in excess sludge at the Chiba Refinery and the Sakaide Refinery.

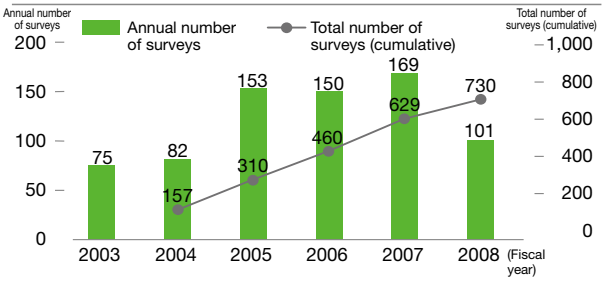
1. Research is being carried out as a project supported by the Japan Petroleum Energy Center (JPEC).

Soil Preservation

Policy

To reduce the risk to the environment from soil contamination, particularly at service stations, the Cosmo Oil Group takes preventative measures and works to minimize environmental damage in the case of spills and leaks. The Group has been conducting soil environment surveys at its service stations, placing priority on stations with a higher risk profile such as older facilities and those with single-shell tanks. As part of these efforts, Cosmo Oil also offers instructions and guidance to its dealers. In fiscal 2008, Cosmo Oil carried out approximately 100 surveys of soil and expended some ¥1 billion on soil preservation measures. The Group will continue to carry out soil surveys as required and conduct surveys at service stations with older types of equipment. Cosmo Oil expects to complete the surveys for all of its service stations in fiscal 2010.

Number of Soil Surveys at Service Stations Owned by Cosmo Oil

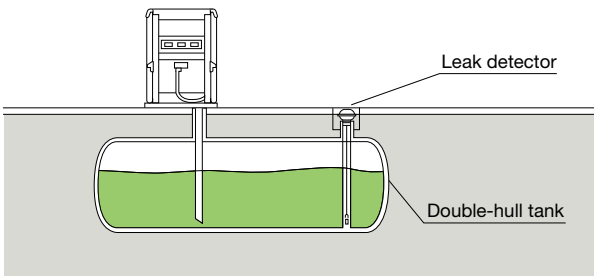


*Figures in prior years' reports included surveys in progress. In the current year's report, however, data has been recalculated to reflect the number of service stations for which surveys have been completed, and figures in 2007 and prior years have been restated according to these changes.

Early Detection of Soil Contamination at Service Stations and Preventative Measures

At its new service stations, the Cosmo Oil Group is proceeding with the installation of equipment and facilities that have an extremely low risk of leakage, including double-hull tanks that prevent oil leakage and plastic pipes that do not corrode. At older service stations, the Group is working to upgrade facilities and equipment by replacing and reinforcing pipe materials and using electrical anti-corrosion treatments.

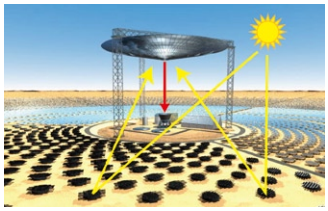
Double-Hull Tank



Lowering Environmental Impact with Next-Generation Energy

Experiments in Concentrated Solar Thermal Power Generation

Cosmo Oil has joined forces with the Abu Dhabi Future Energy Company (Masdar), a governmental organization of the UAE Emirate of Abu Dhabi, and the Tokyo Institute of Technology to develop concentrated solar thermal power generation technology. Experiments in Abu Dhabi utilizing beam-down solar concentrating technology developed by the Tokyo Institute of Technology are collecting massive amounts of data that will be crucial for designing large-scale commercial plants in the future. The goal of this project is to further reduce the cost of power generation.



Artist rendering of concentrated solar thermal power generation

Message

Leading the Way to Success in Concentrated Solar Thermal Power Generation

Hiroyuki Wada
Manager
Future Energy Group,
International Ventures
Department

We have faced a number of challenges in this project, which is our first foray into developing concentrated solar thermal power generation technology, and also a significant undertaking based outside of Japan. Nevertheless, like the solar-powered battery field, this area holds great promise for the future. We are working hard to solve technical problems as they arise to deliver as soon as possible this new technology, which represents a significant advance for Cosmo Oil and an even greater development for the environment.

Distribution Trials of Bio-Gasoline with Bio-ETBE

Aiming to reduce greenhouse gas, in fiscal 2007 Japan's petroleum industry launched a distribution demonstration project to offer trial sales of bio-gasoline,[2] a regular gasoline mixed with bio-ETBE. The trial was expanded in fiscal 2008 to involve 100 service stations, including nine owned by Cosmo Oil, in various cities in Japan such as Sendai and Osaka. The number of service stations involved continued to expand after the trial was complete, and a full-scale introduction of bio-gasoline is scheduled for fiscal 2010.

2. Bio-gasoline: Used exactly as regular gasoline, bio-gasoline is a blend of regular gasoline and bio-ETBE, a compound substance of bio-ethanol derived from plants such as corn or sugarcane and the petroleum-based gas isobutene.

Hydrogen and Fuel Cells

As part of the Japan Hydrogen and Fuel Cell Demonstration Project,[3] Cosmo Oil began operating the Yokohama-Daikoku Hydrogen Station in fiscal 2002. In fiscal 2008, the Group began 70 MPa replenishment experiments to increase the capacity for hydrogen replenishment, and is currently reviewing the possibility of a hydrogen supply infrastructure in the future. In the stationary fuel cell business, based on the results of a stationary fuel cell demonstration project carried out in fiscal 2005, Cosmo Oil intends to bring LPG fuel cell systems to the market in fiscal 2009, which will help reduce the typical household's CO_2 emissions.

3. Japan Hydrogen and Fuel Cell Demonstration Project: This project is supported by the Japanese Ministry of Economy, Trade and Industry and involves field testing of fuel cell-powered vehicles and hydrogen supply equipment.

Gas to Liquid (GTL) Technology

Cosmo Oil partnered with five other private sector companies to establish the Nippon GTL Technology Research Association, which is currently working with Japan Oil, Gas and Metals National Corporation to field test GTL technology.[4] To conduct the testing, a GTL demonstration plant was completed in Niigata City in April 2009 and trial operations were launched. GTL is an effective technology for providing alternative fuel sources to petroleum and for manufacturing clean fuel. Through this testing and research, a unique Japanese GTL technology is expected to be developed and commercialized. As a participant in activities such as these, Cosmo Oil is working to achieve an optimum balance between securing energy supplies in the future and preserving the global environment.

GTL demonstration plant

4. GTL technology: This technology is a refinery process that chemically converts natural gas into synthetic gas (mixed CO and H2 gas). The mixed gas is then converted into liquid fuel using the Fischer-Tropsch process.

Environmental Accounting

The Cosmo Oil Group introduced environmental accounting in fiscal 2000 to ensure the effective implementation of environmental preservation measures. In fiscal 2008, the Group continued to employ this type of accounting to determine environmental preservation costs and benefits, as well as the economic effects of these measures.

WEB Detailed information: Environmental accounting
http://www.cosmo-oil.co.jp/eng/csr/accounting/ev_accounting.html