

“Living with Our Planet”

When crude oil is extracted, gas comes out with the oil.

Up until now, in Middle East oil fields this gas was burned at the top of a tower.

CO₂ was discharged into the atmosphere along with the flames.

In order to eliminate this, we developed a system for returning the gas to the underground oil layer.

The flames are extinguished and there is an annual reduction of approximately 200,000 tons of CO₂.

We are seeking the ideal form of energy, while facing up to environmental problems on a global scale, in order to realize a sustainable society.

- 1 We are striving to conserve the environment all around the world, and at the same time to alleviate the impact of our business on the environment.
 - Prevention of climate change
 - Improving quality of petroleum products
- 2 We are taking a hard look at the future in our struggle for technological development.
 - Development of environmentally friendly technology and products
- 3 We are carefully considering the optimal mix of energy, while striving to become a comprehensive energy business.
 - Development of new sources of energy

Prevention of climate change

CO₂, the principal cause of climate change, is emitted both at the stage of production of oil and at the stage of use by our customers. CO₂ is a substance that has always existed in the natural world, and if it ceased to exist, on the contrary the earth would cool down. Frankly speaking, climate change can be said to be an environmental problem brought about by the excessive emissions of CO₂ as a result of the mass consumption - mass disposal society. Right across our business, from extraction to sales in service section, we are taking action to prevent climate change. At the same time, going beyond the framework of the oil industry, we are implementing pro bono activities aimed at preventing warming, in conjunction with our customers who use oil. Furthermore, we are expanding educational activities aimed at encouraging "noble use" of petroleum, based on our desire that oil be used with great care.

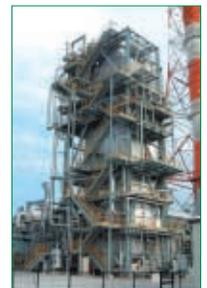
When the flames vanish, the CO₂ also vanishes.

In order to eliminate the CO₂ that is released into the air along with the fiercely burning flames at the top of exhaust chimneys, we have developed a system for returning the gas to the underground oil layer. The result is the flames vanish, with an annual reduction of 200,000 tons of CO₂ emissions.



In refineries and offices

In our refineries the basic units of energy consumption have been reduced by 10.7% compared with 1990 by efficient use of energy (notably by use of cogeneration systems) and strengthening of operating controls, etc. In our head office an energy saving of 3% compared with 2002 has been achieved by thorough turning off of lights, etc.



Support for afforestation in Australia

In 2001 Cosmo Oil concluded a CO₂ emission option agreement in relation to a remote area of south-western Australia, and planting of eucalyptus trees commenced. In 2003 the company acquired the right to emit the 47,489 tons of CO₂ absorbed by this forest.



Together with our customers

We push forward with action to prevent climate change with our Cosmo the Card Eco members. We are also taking advantage of our commercials and other advertisements and events to raise consumers' awareness of global warning.

Improving the quality of petroleum products

In the life cycle of petroleum products, the greatest environmental impact arises during use by customers. For this reason, Cosmo Oil is moving aggressively to develop technology to remove sulfur, which causes air pollution, from petroleum products.

Moving towards supply of sulfur free gasoline and diesel

Cosmo Oil is progressing its preparations with the aim of commencing supply of sulfur free (sulfur content of 10ppm or less) gasoline and diesel from 2005. For the purpose of production of sulfur free gasoline, we have installed new desulfurization equipment at our Chiba, Yokkaichi and Sakai refineries for FCC (fluidized catalytic cracker) gasoline (*1). Furthermore, at our Sakaide refinery, we have made a change to processing by the heavy oil desulfurization device prior to the FCC function. Also we will be producing sulfur free diesel using a high-performance catalyst (*2) that we have developed in addition to the current desulfurization equipment. From May 2004 we have been doing verification testing of this catalyst developed at our Chiba refinery, and assuming that this catalyst is suitable, we will be able to produce sulfur free diesel without major investment in plant and equipment.

*1 FCC gasoline: Given that this is the gasoline component with the highest sulfur content, the sulfur content of the gasoline as a whole can be reduced by reducing the sulfur content of this component.

*2 High-performance catalyst: Developed by our company with the assistance of PEC (Petroleum Energy Center) and NEDO (New Energy And Industrial Technology Development Organization).

Achieving clean exhaust gas

In May 2004, research by members of Cosmo Oil Research & Development Center into the influence of fuel on "HCCI combustion" was awarded the 54th Automobile Technology Association Asahara Science Encouragement Prize. "HCCI combustion" is a future technology that is environmentally friendly, having the possibility of achieving both high efficiency and clean exhaust gas. High hopes are held of its suitability for automobile engines.

Currently we are carrying out research jointly with automobile manufacturers and universities to push forward the results of the research to date in order to optimize the fuel quality in the HCCI engine.

Reference For details, please see pp.5-6 of the Data Book.

Development of environmentally friendly technology and products

We are pushing forward development of a variety of petroleum related environmental technology, such as for waste reduction and soil environmental conservation.

Of these environmentally friendly technologies and products, we especially offer to the market those that contribute to alleviating environmental damage not only in the oil industry but also in a wide variety of fields.

The possibility of "bioremediation" soil cleaning technology

We research methods for cleaning soil contamination using earth friendly microorganisms.

Thus far we have been able to establish methods for accurately measuring oil elements in the soil and for determining whether bioremediation (the microorganism method) is possible or not



Reducing surplus sludge by 50% with the sludge volume reduction equipment

Surplus sludge discharged by the wastewater plant takes up the biggest share of industrial waste generated by oil refineries. Cosmo Oil Research & Development Center has developed a volume reduction device that returns surplus sludge to the wastewater plant after solubilization processing.

In 2002 we carried out verification testing at our Sakaide refinery, and a 50% reduction was achieved. Then in 2003 we started full operation at the Sakaide refinery and achieved a major reduction of sludge, and stable operation continues to the present time.

We are also participating in a PEC project and carrying out further research and development with a view to verification testing at our Chiba refinery.



Reference For details, please see p.7 of the Data Book.



Rapidly growing wind power generation

In 2003 the total generating capacity of wind power around the world was 40,000,000 kW. By the end of 2006, wind power is expected to exceed 60,000,000 kW, which is 10% of total generating capacity in Europe.

Development of new sources of energy

Great change in industrial structure has accompanied technological innovation, and action in respect of limited energy sources and environmental conservation are demanded.

As an energy business, in order to continue to supply the best possible energy, Cosmo Oil Group is aware of the importance of building up a business portfolio based on a long-term perspective.

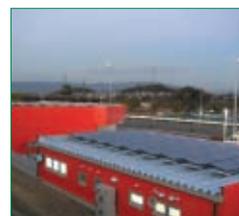
Aiming at becoming an integrated energy business, we are working in the oil development, electric power, gas and new energy businesses.

While new energy sources at this stage have unresolved issues relating to stability, cost and versatility, etc., they are indispensable for the sustainable development of society.

We are making ongoing efforts aimed at practical application of new energy sources, in the areas of research, technological development and commercialization.

Opening a new direction with clean energy

We carry out introduction and practical application of clean, renewable energy, which is attracting attention due to the heightened awareness of environmental conservation. We have installed solar panels in some SS and are moving into the wind power generated electricity business, and we are studying the production and supply of energy using biomass.



Towards realization of a hydrogen energy society

Cosmo Oil is pushing forward with research, development and commercialization of the production, supply and use technology of hydrogen, the next generation green energy. In March 2003 the JHFC Yokohama Daikoku Hydrogen Station commenced operation and we gathered data for practical application. Also we conducted joint research on hydrogen filling technology with Nissan Motor Co., which has brought out a fuel cell vehicle, the TRAIL FCV. Finally, in order to make the most of oil-related fuels, we conducted research and development and field studies aimed at practical application of a fuel cell for home use that uses kerosene and hydrogen.

