

## Stable and Secure Supply of Oil and Environmental Protection in Oil-producing Countries

Japan depends on imports of crude oil from abroad, largely from the Middle East. To ensure a stable supply of energy, Cosmo Oil has been developing the crude oil business in Abu Dhabi in the UAE (United Arab Emirates) since the 1960s and established Abu Dhabi Oil Co., Ltd. in 1968.

Crude oil from our independently developed oil field accounts for about 15 percent of the crude oil we process, which is a high level for Japanese-capital companies.

### Relationship Development with Oil-producing Countries and Activities in Abu Dhabi Oil

Cosmo Oil Co., Ltd. has been developing relationships with oil-producing countries including Abu Dhabi in the UAE since 1960s, and the Chairman of Cosmo Oil currently serves as the vice president of the United Arab Emirates-Japan Society. We are actively engaged in personnel



Mr Yousef Omeir, CEO, and other members of Abu Dhabi National Oil Company (ADNOC) visited Japan in January 2002 and actively exchanged their views with Mr Okabe, Chairman of Cosmo Oil, Office of Abu Dhabi Oil

dispatching, technological services, and cultural exchanges as well as the promotion of international friendship.

Abu Dhabi Oil, in which we hold a majority share (51.1%), is operated by a total of approximately 300 staff consisting of about 130 employees from 18 countries (including about 50 Japanese employees) and contract employees. It plays a central role in the local Japanese society and is actively promoting cultural exchange activities and a student exchange program. In addition, the company is working to create an HSE (Health, Safety and Environment) management



Office of Abu Dhabi Oil

system as well as to set up an emergency contact system and to improve disaster prevention equipment and facilities such as oil booms.

Abu Dhabi Oil is working hard to protect the environment in the local community. The company is helping to “green” the region by planting mangroves and treating domestic wastewater with wastewater treatment equipment to be used for watering trees planted on Mubarraz Island.



#### Mangrove forest planted by Abu Dhabi Oil

Mangrove Planted in Mubarraz Island

1. Seeded year: 1983
2. Type: (1) *Avicennia marina* – Indigenous species of Abu Dhabi  
(2) *Rhizophora stylosa* – Indigenous species of Pakistan  
(3) Others

Type (1) accounts for 95% of the mangroves planted.

3. Mangrove habitat:
  - (1) Mubarraz Island: 7,385 square meters
  - (2) Others: 2,445 square meters
4. Maximum tree height: approximately 5 meters
5. Maximum trunk diameter: approximately 10 centimeters

### Zero-Flare Project: Achieving a Reduction in CO<sub>2</sub> Emissions of Approx. 200 Thousand Tons per Year

A familiar sight at oil fields around the world is the orange flame—the flare—of associated gas\*<sup>1</sup>, which emerges during crude oil production, being burned in the atmosphere. This results in the airborne emissions of a substantial amount of CO<sub>2</sub> and other toxic substances.

Abu Dhabi Oil Co., Ltd. and its affiliated companies operate Mubarraz, AR and GA Oil Fields\*<sup>2</sup>, and at the latter two of these oil fields, we started, in November 2000, the Sour Gas Reinjection Project, in which associated gas is reinjected into the earth. Through this project, the associated gas, which previously was burned off, is repressurized by a large compressor and reinjected into the reservoir, thus reducing emissions of SO<sub>x</sub> and CO<sub>2</sub>. The reinjected gas increases the reservoir pressure thereby increasing crude oil recovery rates. This project not only helps to prevent air pollution in Abu Dhabi, but also contributes greatly to the prevention of global warming. The project was selected as the Supreme

#### \*1 Associated gas

The gas that emerges from the oil field during crude oil production. There are two types of gases: “sour gas” and “sweet gas”. Sour gas refers to natural gas containing more than trace amounts of acid gas such as carbon dioxide and hydrogen sulphide.

#### \*2 AR and GA Oil Fields

AR Oil Field: Umm Al Ambar Oil Field  
GA Oil Field: Neewat Al Ghalan Oil Field

Abu Dhabi Oil operates Mubarraz, AR and GA Oil Fields and mixes the crude oil produced at these three oil fields to ship it as the “Mubarraz Blend”. and GA Oil Fields and mixes the crude oil produced at these three oil fields to ship it as the “Mubarraz Blend”.

Winner of the "2000 ADNOC HSE Award" presented by the Abu Dhabi National Oil Company.

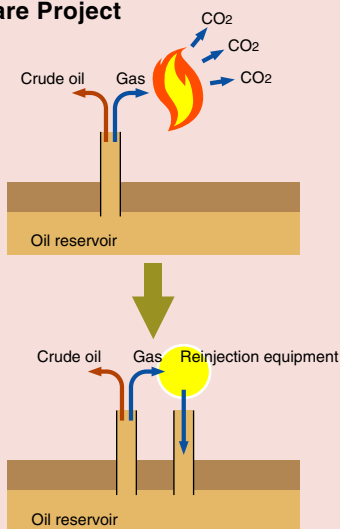
The Mubarraz oil field, which started the reinjection of associated gases in May 2001, is the third oil field at which we have achieved zero-flare



Production at the Abu Dhabi Mubarraz Oil Field

operation following the AR and GA oil fields. As a result, we succeeded in reducing CO<sub>2</sub> emissions by approximately 200,000 tons per year.

## Zero-Flare Project



## Safe, Energy-saving Ocean Transport of Crude Oil: Promoting Double Hulls for Oil Tankers

Crude oil is transported from the Middle East to Japan by tanker. A VLCC (Very Large Crude Carrier) tanker with a capacity of over 200 thousand tons can transport enough crude oil to power the nation for one-third of a day by each trip, which takes approximately 20 days.

The top priority in our tanker operations is safety. Selected and experienced crews operate our VLCCs and the ships have state-of-the-art equipment including collision avoidance controllers to ensure safe passage in dangerous waters and are well-prepared for severe weather.

To respond to the unlikely occurrence of an accident resulting in oil spills, we have been switching to oil tankers with double-hulls since 1998.

The double-layered hulls provide double protection against oil spills. As of March 31, 2002, four out of 12 term-charter vessels were double-hulled. In addition, we pay careful attention to the protection of the ocean environment by taking measures such as ensuring the use of oil booms during the loading and unloading of oil tankers.



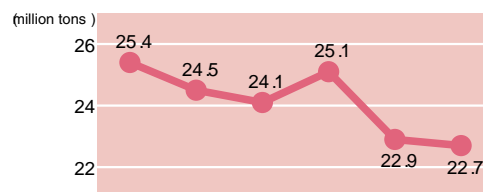
Double-hull tanker which prevents oil spills

To reduce energy consumption during transport, we are shifting to larger vessels and improving the efficiency of tanker operations.

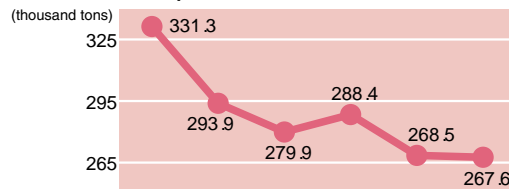
The use of VLCCs has resulted in a 10 percent reduction in the fuel used per volume of transported crude oil compared to FY 1996 levels. To increase the efficiency of tanker operations, Cosmo Oil, together with Nippon Mitsubishi Oil Corporation (presently, Nippon Oil Corporation), founded Nippon Global Tanker Co., Ltd. in November 2000, aiming at joint tanker operations. By drawing on advantages of scale, the new company provides increased efficiency in ships and operations, as well as reduced fuel consumption.

## Term-charter VLCC Fuel Consumption

### Total Amount Transported



### Total Fuel Consumption



### Fuel Consumption per Thousand Tons Transported

