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# Country Analysis Briefs: 1994



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*Profiles of Major World Energy Producers,  
Consumers, and Transport Centers*

*Energy Chronology for 1994*

**May 1995**

**Energy Information Administration**  
Office of Energy Markets and End Use  
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# Preface

**Background Information**      *Country Analysis Briefs: 1994* is a compilation of country profiles prepared by the Energy Markets and Contingency Information Division (EMCID) of the Office of Energy Markets and End Use. EMCID maintains Country Analysis Briefs (CABs) for specific countries or geographical areas that are important to world energy markets. As a general rule, CABs are prepared for all members of the Organization of Petroleum Exporting Countries (OPEC), major non-OPEC oil producers (i.e., the North Sea, Russia), major energy transit areas (i.e., Ukraine), and other areas of current interest to energy analysts and policy makers. As of January 1995, EMCID maintained over 40 CABs, updated on an annual schedule and subject to revision as events warrant. This report includes 25 CABs updated during 1994.

**CAB Contents**                      All CABs contain a profile section, a map showing the country's location, and a narrative section. The profile section includes outlines of the country's economy, energy sector, and environment. The narrative provides further information and discussion of these topics. Some CABs also include a detailed map displaying locations of major oil and gas fields, pipelines, ports, etc. These maps were created as a result of special individual requests and so are not typically a standard feature of the CABs. They are presented here wherever available as a supplement to the information contained in the CABs.

**EIA Home Page**                      All CABs contained in this report are complete through the date listed in the lower right-hand corner of each page. The most recent version of each CAB can be accessed electronically through EIA's "Home Page" on the Internet. To locate EIA's Home Page, open the Uniform Resource Locator named: <http://www.eia.doe.gov>, using a hypertext viewer such as Mosaic or Netscape. CABs can then be viewed and printed directly.

**Sources of Information/Data**      EMCID strives to present the most current information or estimates available at the time of each CAB update. Energy Information Administration data or estimates are used where available. The most authoritative sources are usually the official national statistical reports of the foreign countries which are analyzed. However, data from official sources are not always available. Therefore, EMCID also uses information from reputable secondary sources, such as international organizations, energy encyclopedias, other federal government agencies, and industry/trade/business press. Financial and economic data are gathered primarily from the WEFA Group, the International Monetary Fund, and the World Bank. Other information is obtained from the U.S. Central Intelligence Agency's *The World Factbook 1994*, *Arab Oil and Gas Directory*, and the *International Petroleum Encyclopedia*. Trade and business press sources include *Dow Jones* wire service, *Energy Compass*, *Financial Times*, *Foreign Reports Inc.*, *Middle East Economic Digest*, *Middle East Economic Survey*, *New York Times*, *Oil and Gas Journal*, *Petroleum Intelligence Weekly*, *Wall Street Journal*, *Washington Post*, and *Weekly Petroleum Argus*. In order to help establish

and maintain an authoritative international energy analysis series, each year EMCID reviews each country's profile and data, makes comparisons with other sources, and discusses the information with other experts. Thus, through a series of updates, checks, and reviews, the international energy analysis provided is regularly monitored to help ensure the publication of accurate and authoritative information in the *Country Analysis Briefs*.

## Contacts

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## Abbreviations and Definitions

**bbl/d** - barrels per day  
**Bcf** - billion cubic feet  
**BP** - British Petroleum Co.  
**Btu** - British thermal unit(s)  
**E (following a year)** - the number is estimated  
**Carbon/GDP ratio** - calculated using market exchange rates  
**Energy/GDP ratio** - calculated using market exchange rates  
**FSU** - Former Soviet Union  
**GDP** - gross domestic product (expressed on a purchasing power parity basis)  
**GNP** - gross national product (expressed on a purchasing power parity basis)  
**IBRD** - International Bank for Reconstruction and Development  
**IMF** - International Monetary Fund  
**JV** - joint venture  
**km** - kilometer(s)  
**kWh** - kilowatt hour(s)  
**mi** - mile(s)  
**LNG** - liquefied natural gas  
**MMbbl/d** - million barrels per day  
**MMst** - million short tons  
**MW** - megawatt  
**OPEC** - Organization of Petroleum Exporting Countries  
**sq km** - square kilometer(s)  
**sq mi** - square mile(s)  
**Tcf** - trillion cubic feet  
**TWh** - terawatt hours

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# Algeria

## COUNTRY OVERVIEW

**President:** Liamine Zeroual  
**Prime Minister:** Mokdad Sifi  
**Independence:** July 5, 1962 (from France)  
**Population (1994E):** 27.9 million  
**Location/Size:** North Africa/2,382,367 sq km (919,837 sq mi), about four times the size of Texas  
**Major Cities:** Algiers, Oran, Constantine  
**Languages:** Arabic (official), French, Berber dialects  
**Ethnic Groups:** Arab-Berber 99%, European less than 1%  
**Religions:** Sunni Islam (state religion) 99%, Christianity and Judaism 1%  
**Defense:** National Popular Army: 105,000; Navy: 67,000; Air Force: 10,000

## ECONOMIC OVERVIEW

**Currency:** Algerian Dinar (AD)  
**Market Exchange Rate (9/94):** US\$1 = AD38.2  
**Gross Domestic/National Product (GDP) (1993E):** \$89 billion  
**Real GDP Growth Rate (1993E):** 2%  
**Inflation Rate (consumer prices, 1993E):** 22%  
**Current Account Balance (1993E):** \$170 million  
**Major Trading Partners:** France, Italy, USA, Spain, Germany  
**Merchandise Exports (1993):** \$11.4 billion  
**Merchandise Imports (1993):** \$9 billion  
**Major Export Products:** Oil and natural gas  
**Major Import Products:** Industrial equipment, intermediate goods, food, consumer goods  
**Oil and Gas Export Revenues (1994E):** \$9.5 billion, of which \$6.9 billion is oil and \$2.6 billion is natural gas  
**Oil and Gas Export Revenues/Total Export Revenues (1993E):** 97%  
**Unemployment Rate (1993E):** 22%  
**Total External Debt (1994E):** \$26 billion  
**Total Reserves (non-gold) (6/94):** \$2.1 billion

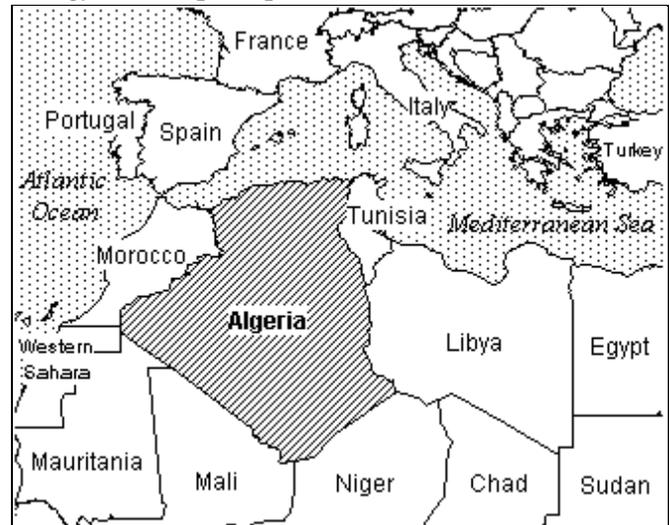
## ENERGY OVERVIEW

**Energy Minister:** Amar Makhloufi  
**Proven Oil Reserves (1/1/94):** 9.2 billion barrels  
**Oil Production (1994E):** 1.32 million barrels/day (bbl/d), of which 760,000 bbl/d is crude oil and 560,000 bbl/d is condensate  
**Oil Production Capacity (1994E):** 1.36 million bbl/d  
**OPEC Crude Oil Quota (1994):** 827,000 bbl/d  
**Oil Consumption (1994E):** 220,000 bbl/d  
**Crude Oil Refining Capacity (1/1/93):** 530,000 bbl/d  
**Net Oil Exports (1994E):** 1.1 million bbl/d  
**Natural Gas Reserves (1/1/94):** 128 trillion cubic feet (tcf)  
**Natural Gas Production (1993):** 2 tcf

**Natural Gas Consumption (1992E):** 0.8 tcf  
**Natural Gas Exports (1993):** 1.2 tcf  
**Electric Generation Capacity (1993E):** 6.4 gigawatts  
**Electricity Generation (1993E):** 16.4 billion kilowatt hours

## ENVIRONMENT OVERVIEW

**Total Energy Consumption (1992):** 1.26 quadrillion Btu  
**Energy Consumption per Dollar of GDP (1992):** 21.9



thousand Btu (vs. 17.7 thousand Btu in U.S.)  
**Energy Consumption per Capita (1992):** 48 million Btu (vs. 321.8 million Btu in U.S.)  
**Energy-related Carbon Emissions (1992):** 21 million metric tons (0.4% of world carbon emissions)  
**Carbon Emissions per Thousand Dollars of GDP (1992):** 0.36 metric tons (vs. 0.29 metric tons in U.S.)  
**Carbon Emissions per Capita (1991):** 0.82 metric tons (vs. 5.3 metric tons in U.S.)  
**Major Environmental Issues:** Algeria is contributing to the pollution of the Mediterranean Sea with oil wastes, soil erosion, and fertilizer runoff. As a result, the supply of potable water in Algeria is limited.

## OIL AND GAS INDUSTRIES

**Organization:** **Sonatrach** - State-owned company for exploration, transport, and marketing of petroleum, natural gas, and their products; **Naftec** - Operates and manages all refineries; **Naftel** - Distributes petroleum products domestically.  
**Major Ports:** Algiers, Annaba, Arzew, Bejaia, La Skhirra, Oran, Skikda  
**Major Oil and Gas Fields:** Hassi R'Mel (gas), Hassi Messaoud (oil), Rhourde El Baguel (oil)  
**Major Pipelines:** Houd el-Hamra/Bejaia, In Amenas/La Skhirra, Haoud el-Hamra/Arzew, Beni Mansour/Algiers, Haoud el-Hamra/Skikda, TransMed (Algeria-Sicily-Italy), Maghreb-Europe (mid-1996) (Algeria-Morocco-Spain-

Portugal)

**Major Refineries:** Ain Amenas, Algiers, Arzew, Bejaia, Hassi/ Messaoud, Skikda

**Gas Export Pipelines:** TransMed, Maghreb-Europe

## **GENERAL BACKGROUND**

Algeria has experienced severe political and economic problems since 1991, beginning with the military-backed government's decision to annul the electoral victory of the fundamentalist Islamic Salvation Front (FIS) late that year. Subsequently, the government banned the FIS, prompting violence and growing hostilities between FIS supporters and government forces. The FIS seeks to advance political Islam, a religiously based movement that aims to replace the mostly secular governments of Muslim countries with governments that would rule according to Islamic law (Shari'a). Much of Algeria's ongoing political violence is between the Islamic movement's extremist wing and the state security services, but Algerian public figures--especially political moderates--have become targets as well.

Algeria's chronic economic and social problems have helped fuel the country's continuing violence, which has claimed thousands of lives since 1991. The Armed Islamic Group, responsible for a number of violent crimes against foreigners, aims to drive out some 70,000 expatriates, further harm the economy and, in turn, destabilize the military-backed government. So far, political violence has not interfered directly with ambitious plans for expansion of the country's hydrocarbon sector.

The oil and gas industry has not been immune to Algeria's turmoil. The FIS has targeted Westerners, including French diplomats and journalists, in addition to ordinary Algerian citizens it considers hostile to its beliefs. Although the Algerian government maintains that political violence poses no threat to oil supply or exports, unrest and threat of civil strife has prompted oil firms to take precautions, including the evacuation of expatriates, in 1993 and 1994.

In April 1994, the government finally made the concessions necessary to conclude a new agreement with the International Monetary Fund (IMF), under which the country is to receive financial assistance of about \$1 billion in return for fulfilling certain

conditions imposed by the IMF. Mandated are a 40% devaluation of the dinar, a sharp increase in interest rates, and a debt rescheduling program. Having accumulated a total external debt of some \$26 billion during the 1970s and 1980s, Algeria has been hit hard by the sharp fall in oil prices since 1986.

## **OIL AND GAS OVERVIEW**

As part of its debt rescheduling agreement with the IMF, Algeria has signed a number of hydrocarbon exploration contracts with international oil companies and given more independence to petroleum services companies grouped under Sonatrach. Algeria's new petroleum policy aims to maximize oil and gas production by opening the hydrocarbon sector to foreign investment. The government has attempted to encourage such investment by allowing foreign partners of Sonatrach up to 49% of production sharing without restriction, and by giving them tax-exempt status so that they will no longer be taxed twice. Sonatrach is also reorganizing and changing objectives to better fit growing global petroleum industry interdependence. Sonatrach is thus seeking to expand via joint ventures with international, privately owned companies for hydrocarbon exploration and natural gas pipeline projects.

Algeria relies on oil and gas exports for nearly all (about 97%) of its hard currency earnings. Roughly one-third of these earnings are derived from natural gas and two-thirds from oil. Natural gas represents 70% of Algeria's total recoverable hydrocarbon reserves, compared to 17% for crude oil, 10% for condensate, and 3% for natural gas liquids.

## **OIL**

Algeria has enormous sedimentary basins that potentially contain larger amounts of oil than gas. Although Algeria's proven oil reserves have not changed significantly in the last few years, improved data from existing fields and the installation of Enhanced Oil Recovery (EOR) systems (such as gas or water injection) could result in higher estimates of recoverable reserves in the future. The infusion of foreign capital and expertise from a diverse set of companies is helping Algeria to gather more accurate data and implement EOR. Some examples include:

- Sonatrach has joined forces with Canadian Encor and

Australia's Norcen in a three-year exploration project, which includes seismic gathering and the drilling of three wells. Sonatrach will retain 51% of the production from any discovery. The 3.3 million acre exploration area is about 300 kilometers (186 miles) south of Algiers and due west of the Hassi R'Mel gas field.

- A consortium of German companies has signed a contract with Algeria to sink three exploratory wells in the Saharan desert block Hamadat El Guelta. Located east of Hassi Massaoud, the exploration will take five years and cost an estimated \$24.5 million.
- South Korea's state-run oil company, PEDCO, has signed a production-sharing agreement with Algeria's Sonatrach for an onshore oil exploration project. Drilling will begin after an economic feasibility study is conducted in January 1995. The field, Bourekhrat, is located in Algeria's southeast region and covers 5,583 square kilometers (2,155 square miles). PEDCO estimates the field to contain reserves of 120 million barrels. The agreement enables the Korean side to claim from 10% to 42% of the oil found, pending the amount.
- In June 1994, Sonatrach and Anadarko Petroleum Corp. struck oil in the Illizi basin in the Sahara, southeast of the main Hassi Massaoud oilfield. This was the fourth largest discovery by Anadarko since early 1993.
- PetroCanada reached agreement with Sonatrach in 1994 for nine wildcat wells in Sahara Desert Illizi area.

## **REFINING**

Algeria has not increased its refining capacity at all since 1980-1981, when it was boosted by the start-up of two new plants. Before that, Algeria had three refineries with a capacity of 145,000 bbl/d; the construction of the two new refineries tripled the country's refining capacity to 474,000 bbl/d. Algeria has no plans to expand refining capacity in the foreseeable future.

## **NATURAL GAS**

Algeria has given its natural gas sector top priority and plans to develop the industry to yield 7.3 billion cubic feet (Bcf) per day by the turn of the century. This involves the rehabilitation of existing fields and facilities, followed by the expansion of gas liquefaction plants and the construction of major new export pipelines.

Algeria's natural gas reserves are concentrated in the

huge Hassi R'Mel gas field south of Algiers. Discovered in 1956, Hassi R'Mel is one of the world's largest gas fields, with proven reserves estimated at 86 tcf, and probable reserves of 95-105 tcf (over two-thirds of Algeria's total). With production of 1.3 Bcf per day, Hassi R'Mel accounts for about 25% of Algeria's total gas output.

Algeria has four liquefaction plants that produce liquefied natural gas (LNG) for export (three at Arzew and one in Skikda). The three plants at Arzew have a combined production of 2.22 Bcf per day and the Skikda plant produces 760 million cubic feet (Mmcf) per day. Most of the LNG is exported to western European markets. Gas reserves are substantial, but production capacity is limited; at

present, Algeria cannot satisfy all of its demand.

Natural gas exports are close to current delivery capacity of 1.2 tcf. Exports could reach 2.2 tcf by 1997; this projected increase is based on new projects: the planned increase in capacity of the Trans-Med pipeline and the opening of a Maghreb-Europe pipeline.

The TransMed gas pipeline links Algeria to Sicily and mainland Italy. Sonatrach and ENI of Italy built the 1,075-km (668-mile) pipeline. Sonatrach agreed to supply 10.6 tcf of gas to ENI over a period of 25 years, beginning in 1983. The pipeline runs from the Hassi R'Mel field in Algeria, through Tunisia to Mazza del Vallo in Sicily, and then continues to mainland Italy.

The Maghreb-Europe pipeline, a 1,870-kilometer (1,162-mile) pipeline, is being constructed to supply Algerian gas to Spain and Portugal via Morocco and the Strait of Gibraltar. The \$2.5 billion project is scheduled to be completed in mid-1996. An agreement has been signed between Sonatrach and Spain's Enagas to start gas deliveries by October 1995, reaching 212 Bcf per year by 2000. Portugal has also signed to take 88 Bcf per year beginning in October 1996. Algeria awarded a U.S. company, Bechtel Corp., \$450 million to build the 530-kilometer (329-mile) Algerian section of the pipeline. The section between Algeria and Cordoba via Morocco and the Strait of Gibraltar is due on stream in early 1996. In a second phase, the pipeline will be extended to carry Algerian gas on to Portugal, France, and Germany.

# Angola

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## COUNTRY OVERVIEW

**President:** Jose Eduardo dos Santos

**Population (1994E):** 9.8 million

**Location/Size:** Southern Africa/1,246,700 sq km (450,00 sq mi), approximately twice the size of Texas

**Languages:** Portuguese (official); various Bantu dialects

**Religion:** Indigenous beliefs, Roman Catholic, Protestant

**Ethnic Divisions:** Ovimbundu (35%), M'Bundu (25%),

Bakongo (15%), all other ethnic groups (25%)

**Defense (6/92):** Army (120,000), Navy (1,500), Air Force (6,000); UNITA - Army (28,000), Militia (37,000)

**Major Cities:** Luanda (capital), Benguela, Lobito, Huambo

## ECONOMIC OVERVIEW

**Gross Domestic Product (1993E):** \$5.7 billion

**Real GDP Growth Rate (1993E):** -22.6%

**Currency:** Kwanza

**Exchange Rate (9/94):** US\$1 = 96,965 kwanza

**Total Foreign Debt (1993E):** \$8.0 billion

**Petroleum Revenue (1993):** \$2.76 billion

**Petroleum Revenue/Total Export Revenues (1993):** 97%

**Import Products:** Capital equipment, food, vehicles, medicine

**Export Products:** Oil, liquefied petroleum gas, diamonds

**Major Trading Partners:** United States, Portugal, Brazil, France, Germany, Spain

## ENERGY OVERVIEW

**Oil Minister:** Albina Assis Africano

**Proven Oil Reserves (1/1/94):** 1.5 billion barrels

**Total Oil Production (1994):** 519,000 barrels per day (bbl/d)

**Oil Production Capacity (1994E):** 530,000 bbl/d

**Domestic Oil Consumption (1993E):** 25,000 bbl/d

**Net Petroleum Exports (1993E):** 475,000 bbl/d

**Petroleum Exports to the United States (1994E):** 307,000 bbl/d

**Refining Capacity (1/1/94):** 32,100 bbl/d

**Natural Gas Reserves (1/1/94):** 1.8 trillion cubic feet

**Natural Gas Production (1993):** 20 billion cubic feet (Bcf)

**Natural Gas Consumption (1993):** 20 Bcf

## OIL AND GAS INDUSTRIES

**Organization:** State oil company is SONANGOL; Cabinda Gulf Oil Company (CABGOC), a subsidiary of Chevron, is the main oil producer

**Major Oil Fields:** Cabinda offshore oil fields including Takula, Pacassa, Palanca, Malongo, and Numbi

**Major Oil Ports:** Cabinda, Soyo, and Luanda

**Major Oil Refineries (1994):** Luanda (32,100 bbl/d)

**Foreign Oil Companies:** Chevron, Elf, Texaco, Agip, Total

British Petroleum, Occidental  
**Major Oil Export Customers:** United States and Europe



### **GENERAL BACKGROUND**

The Angolan government and the National Union for the Total Independence of Angola (UNITA) agreed to an internationally-brokered peace accord in September 1994. After a failed 1991 U.N.-sponsored peace agreement and UNITA's refusal to accept the results of a 1992 democratically-held election, Angola reverted back to its 20 year civil war. UNITA, which has fought the Marxist-turned-Socialist government since Angola's independence in 1975, controlled as much as 65 percent of the country during 1993 and most of 1994. Fighting during this time was centered in strategic areas such as Cuito, Huambo, Soyo, and M'Banza Congo. Diamond mining locations such as Cafunfo were additional targets for UNITA attacks. In 1994, the government was able to recapture most of its 1993 losses, but the costs were high. It reclaimed Cuito in August 1994, but only after 19 months of fighting and thousands of casualties.

The United States, which supported UNITA during the Cold War, officially recognized the Angolan government in May 1993. Subsequently, UNITA felt increasing international pressure to negotiate for peace. After a 1994 threat of additional United

Nations' sanctions, UNITA's leader, Jonas Savimbi, agreed to pursue South African-brokered peace negotiations. The September 1994 talks tentatively will lead to a power-sharing arrangement which will be monitored by the United States, Russia, and Portugal. As of October 1994, talks were stalled on the specifics of both the division of power between the government and UNITA and the exact role of the international monitors. There were also rumors in early October 1994 that Jonas Savimbi was either dead or seriously injured following an assassination attempt by several of UNITA's senior military officers during the previous summer.

The Angolan government also faces an economic threat from the Front for the Liberation of the Enclave of Cabinda (FLEC), which is fighting for the independence of the small enclave located between Zaire and the Congo. Cabinda is the source of 60 percent of Angola's oil production, and oil exports account for over 90 percent of the Angolan government's revenues. FLEC is comprised of members of the M'Congo ethnic group, which is prevalent in Zaire, and it has received aid from that country in the past. Loss of Cabinda could deprive the Angolan government of \$3 billion in oil revenues, which in the past were used to support its army in the fight against UNITA. In February 1994, when government forces were involved in fierce fighting against UNITA, the Angolan government offered limited autonomy to Cabinda in an effort to secure the enclave's allegiance and to dispel the possibility of losing oil revenues.

### **OIL**

The bulk of Angola's oil production is located offshore in Cabinda and in the northern provinces near the town of Soyo. Oil production was relatively unaffected during the civil war because the vast majority is located offshore and the fact that all sides realized the importance of oil exports to Angola's economy. After the United States' recognition of the Angolan government, though, UNITA changed its tactics and began to target the oil industry. In 1993, the Angolan economic growth rate fell 22.6 percent primarily because of UNITA's capture of the oil facilities in Soyo as well as key diamond mines in central Angola.

Since early 1993, a number of incidents have demonstrated the vulnerability of upstream and downstream facilities to insurgent activities. In the first half of 1993, several foreign oil companies based in Soyo suffered disruptions of various kinds when UNITA captured surrounding Zaire province. In January 1993, for instance, the Quinfuquena oil terminal was destroyed, eliminating 90,000 bbl/d of processing capacity for Texaco, Petrofina, Agip, and SONANGOL (Angola's state oil company). Consequently, Texaco cut its offshore production of 65,000 bbl/d, which typically was processed at Quinfuquena. During this time, the company did maintain a nominal production of 7,000 bbl/d, which were loaded directly onto tankers. Later, in May 1993, Texaco finally halted all production for a while after one of its offshore platforms was shelled by UNITA. Also in May 1993, Petrofina's 26,000 bbl/d production from its onshore Soyo and Pemba fields was stopped temporarily after wells, pipelines, and storage tanks were destroyed. Total damages from UNITA's 1993 incursion into Zaire province cost the Angolan government an estimated \$2 million a day in lost oil revenues.

Repairs from the fighting in Zaire province were completed by mid-1993, and since then, Angolan oil production has remained relatively undisrupted. The only major attack on multinational oil facilities took place in January 1994, when FLEC fired mortars into Chevron's heavily fortified encampment at Malongo. Company employees were evacuated by boat to offshore terminals, but returned to work a week later after the area was secured by the Angolan government.

In 1993, Angola was the ninth largest supplier of oil to the United States. Angolan oil production began onshore in 1955 and offshore in Cabinda in 1968. Cabinda crude is sweet and light with an average of 32° API. Most Cabinda crude is exported to Japan, where it is either burned directly by Japanese utilities or is used as a low sulphur feedstock. In 1993, SONANGOL began marketing its Cabinda crude to Asian customers in an effort to generate higher revenues by circumventing its traditional sales frameworks.

Angola was one of the first countries to adopt

licensing arrangements with foreign companies in which the government's profit depended on a field's productivity and the foreign partner's rate-of-return on its investment. This has proven advantageous to foreign companies as deep-water blocks, located in rough seas with unproven reserves, have been offered for auction by the Angolan government. In addition, as the competition by foreign companies for acreage increases, Angola's government has been able to select partners with demonstrated technological expertise. In late 1993, two deep-water blocks were awarded to Elf and Shell. As of September 1994, Chevron, Engen, Exxon, Maxus, Norsk-Hydro, and Texaco were negotiating with the government concerning awards and re-awards in at least nine other blocks.

Chevron's operations in Cabinda account for well over 50 percent of Angola's total oil production. The Cabinda concession, which is divided into three "Areas," is held jointly by Chevron's Cabinda Gulf Oil Company, SONANGOL, Elf, and Agip. The group plans to spend \$2.8 billion before 1999 to develop several potentially important new fields. Currently, there are sixteen producing fields in Area A of the Cabinda concession. The most important are the Takula, Numbi, Wamba, N'Sano, and the three Malongo fields. Area A was the site of extensive waterflooding operations during 1993 in which over 376,000 bbl/d of water was injected into 31 wells. Increased production occurred in the Takula and Numbi fields, and this helped to offset a natural decline in production from the older Malongo fields. Production from the N'Sano field and the new Numbi South field is being linked to the existing Takula field and Numbi field facilities, respectively. Also in Area A, Chevron is aggressively modernizing production facilities, conducting infill drilling, and pursuing well-workovers in an effort to maximize future production levels.

Chevron's major development focus in the Cabinda concession is in Areas B and C. A three-phased development plan is underway for the Kakongo, Nemba, and Lomba fields in Area B and the N'Dola and Sanha fields in Area C. Development plans include the installation of two drilling and production platforms in each of the Areas. In late 1993, a 38-mile pipeline from Areas B and C to onshore

terminals was constructed. The production platform for Kakongo was towed from its construction site in Brazil to Angola in early 1994, and the field is expected to produce an initial 20,000 bbl/d starting in October 1994. Production is expected to reach 50,000 bbl/d by April 1995 and to eventually peak at 60,000 bbl/d. Since Kakongo crude is relatively light

(39° API), and therefore more valuable, Chevron is examining the possibility of storing and marketing it separately from the heavier Cabinda crude.

Elf is the second largest oil producer in Angola. Its Palanca field produces an average of 170,000 bbl/d of 39° API crude. The company also is undertaking large development plans and is spending \$1 billion over five years to develop the promising Cobo and Pambi fields. Production from the Pambi F1 field is expected to begin in late 1994 after the production platform is towed from Brazil. The larger Cobo P1 field is predicted to begin production in mid-1996 and will add an estimated 50,000 bbl/d output to Elf's total. The 10,000-ton production platform for the Cobo P1 field is being built by Technip in France and will have a 150,000 bbl/d capacity.

In October 1994, Texaco announced that it was planning a five year, \$600 million investment in exploration and development of the offshore fields near Soyo. Texaco has spent over \$1.3 billion on its operations in Angola since 1969. This new investment plan will involve joint operations with SONANGOL, and Texaco hopes to raise its total oil output to 90,000 bbl/d by 1999.

# Azerbaijan

## COUNTRY OVERVIEW

**President:** Heydar Aliyev

**Prime Minister:** Vacant (Surat Huseynov fired 10/94)

**Independence:** August 30, 1991

**Population (7/94E):** 7.7 million

**Location/Size:** Former Soviet Union/86,600 sq km (33,400 sq mi), about the size of Maine

**Major Cities:** Baku (capital), Gyandzha, Mingechaur, Nakhichevan, Stepanakert, Sumgait, Yevlakh

**Languages:** Azeri, Russian, Armenian

**Ethnic Groups (1994E):** Azeri (93%), Russian (3%), Armenian (.3%), Other (3%)

**Religions:** Islam, Russian Orthodox, Armenian Orthodox

**Defense (1992):** Army (30,000), Militia (20,000)

## ECONOMIC OVERVIEW

**Currency:** Manat

**Official Exchange Rate (7/94):** US\$1 = 1,000 manats

**Gross Domestic Product (GDP) (1993E):** \$15.5 billion

**Real GDP Growth Rate (1993E):** -13.3%

**Inflation Rate (2/94):** above 50% per month

**Merchandise Exports (outside FSU) (1993):** \$355 million

**Merchandise Imports (outside FSU) (1993):** \$240 million

**Major Export Products:** oil, gas, and related equipment; chemicals, cotton, textiles

**Major Import Products:** machinery, consumer durables, textiles, foodstuffs

**Major Trading Partners:** Former Soviet Union, Europe, Iran, Turkey

**Oil Export Revenues (1994E):** \$291 million

**Oil Export Revenues/Total Export Revenues (1993):** 40%

**Trade Balance (1993E):** \$200 million

## ENERGY OVERVIEW

**Minister of Material Resources:** Farrakh Zeynalov

**Proven Oil Reserves (1993E):** 3.9 billion barrels

**Oil Production (1993):** 208,000 barrels per day (bbl/d)

**Oil Production Capacity (1994E):** 215,000 bbl/d

**Oil Consumption (1993E):** 185,000 bbl/d

**Crude Refining Capacity (1/1/94):** 406,000 bbl/d

**Net Oil Exports (1993E):** 22,000 bbl/d

**Major Oil Customers:** Russia, Europe

**Natural Gas Reserves (1993E):** 11 trillion cubic feet (tcf)

**Natural Gas Production (1993):** 0.24 tcf

**Natural Gas Imports (1993):** 0.19 tcf

**Electricity Generation Capacity (1993):** 6 gigawatts

**Electricity Production (1993):** 19 terawatt-hours

**Electricity Consumption per capita (1992):** 3 megawatt hours

**Major Power Plants (megawatts (MW)):** Ali-Bayramy



thermal plant (1100 MW), Azerbaijani thermal plant (2100 MW)

## ENVIRONMENT OVERVIEW

**Total Energy Consumption (1992):** 0.8 quadrillion Btu

**Energy Consumption per Dollar of GDP (1992):** 53,000 Btu

**Energy Consumption per Capita (1992):** 110 million Btu

**Energy-related Carbon Emissions (1992):** 13.7 million metric tons

**Carbon Emissions per Thousand Dollars of GDP (1992):** 0.88 metric tons

**Carbon Emissions per Capita (1992):** 1.8 metric tons (vs. 5.3 metric tons in U.S.)

**Major Environmental Problems:** Pollution caused by degradation of oil production facilities and pipelines, acid rain, destruction caused by war

## OIL AND GAS INDUSTRIES

**Organization:** State Oil Company of Azerbaijan (SOCAR)

**Major Oil Fields:** Neftiyanje Kamni, Azeri, Chirag, Guneshli, Shakh Deniz, Khilly, Neftechala

**Major Oil Ports:** Baku

**Oil Export Pipelines:** Baku-Shemakha, Baku-Gyandzha, Eviakh-Nakhichevan, Umbaki-Rasht (Iran)

**Major Oil Refineries (Capacities 1/1/94):** Kasporneftegaz (244,000 bbl/d); Novo-Baku (162,000 bbl/d)

**Major Foreign Oil Company Involvement:** Amoco, British Petroleum, Turkish Petroleum, Statoil, Pennzoil, Ramco, McDermott, Unocal

**Major Gas Fields:** Guneshli

**Major Gas Import Pipeline:** Turkmenistan-Azerbaijan

## GENERAL BACKGROUND

Azerbaijan experienced political and economic volatility throughout 1994. President Heydar Aliyev imposed a state of emergency in Baku and Gyandzha after Prime Minister Surat Huseynov led special police (OMON) and army forces in a coup attempt in early October 1994. Two leading government officials were killed, and security in four western Azeri provinces was threatened. Aliyev fired Huseynov, who fled Baku and remains a fugitive as of October 1994.

Steps were taken in 1994 toward ending the seven-year war with Armenia over the Nagorno-Karabakh enclave. To date, the war has claimed 20,000 lives, displaced 1.1 million people, and consumed 70 percent of Azerbaijan's yearly national budget. Beginning in February 1992, Armenian forces made important military gains into Azeri territory by capturing all of Nagorno-Karabakh, opening two supply corridors between the region and Armenia, and threatening key oil and gas pipelines in the central Azeri city of Yevlakh. As of 1994, the Armenian army held 20 percent of Azerbaijan.

Russian diplomatic efforts resulted in a May 1994 cease-fire agreement and subsequent peace negotiations in September 1994. In mid-1993, The UN Security Council adopted two resolutions which called for the withdrawal of all Armenian forces from Azerbaijan. As of October 1994, full compliance with these resolutions had not been achieved, and Armenia's occupation of Azeri land outside Nagorno-Karabakh posed an additional hurdle in future peace talks.

## **OIL**

Azerbaijan was the world's largest producer of oil at the turn of the century. Peak production occurred during World War II when Baku, a major refining center in the former Soviet Union (FSU), produced 500,000 barrels per day (bbl/d). Azeri oil production fell significantly after the 1950s as Soviet interest was re-directed toward fields in the Volga/Urals and in western Siberia.

Since the fall of the Soviet Union, the Azeri government has lacked the funds to repair and service oil drilling and production equipment, and approximately 1,000 wells were idle at the end of

1993. This lack of investment and maintenance is also evident by environmental problems, such as oil leaks from gathering stations and onshore pipelines. Azerbaijan's semi-submersible rigs, many of which were built domestically and modelled after Western rigs, have deteriorated and require large investments for future safe operation.

Azeri oil production fell 5.6 percent in 1992, 7.0 percent in 1993, and 9.4 percent in the first half of 1994. Production in 1993 was estimated at 208,000 bbl/d, with 150,000 bbl/d of that amount coming from offshore fields. The two most productive Azeri fields are Neftianye Kamni, which came onstream around 1950, and Guneshli (formerly 28th April), which started operations in 1979.

Neftianye Kamni currently produces only 16,000 bbl/d, which is down from its 1979 high of 120,000 bbl/d. Roughly 45 percent of its 1.5 billion barrels of reserves have been recovered to date. However, the production facilities are in a serious state of disrepair, and whole sections of the network have fallen into the sea because of severe corrosion. Neftianye Kamni is also the starting point for underwater pipelines which carry oil and gas onshore from Guneshli.

Located 60 miles off the Azeri coast in the Caspian Sea, Guneshli has accounted for over 60 percent of Azeri oil production over the last two years. The field has recoverable reserves estimated at 500 million barrels, and current oil production is approximately 120,000 bbl/d. Russian Lukoil is developing the shallow parts of Guneshli, while the deepwater portions of the field have been allotted to the British Petroleum (BP) consortium because of its technical expertise in fully developing deepwater resources.

In September 1994, after three and a half years of negotiations, the Azeri government signed an \$8 billion, 30-year contract with a consortium of Western companies to develop several Caspian Sea oil fields. The final consortium is comprised of BP (17%), Amoco (17%), and the State Oil Company of Azerbaijan (20%), as well as Lukoil, Pennzoil, Unocal, Statoil, Turkish Petroleum, Ramco, McDermott, and Delta Nimir Khazar.

Caspian oil fields targeted for development by the

consortium are the Azeri, Chirag, and deepwater portions of Guneshli. Total reserves for these three fields are estimated at between three and five billion barrels. Initial production is planned for late 1995 with a projected increase to 80,000 bbl/d by the end of 1997. Peak production of 700,000 bbl/d is expected within 15 years. The Azeri government will receive revenues on a sliding scale which is dependent on production levels and transportation costs. The maximum profit split will be 80-20 in favor of the Azeri government. A \$300 million signing bonus will be paid in installments, with the final amount due at the same time as the start of the first pipeline exports.

Russia has called into question Azerbaijan's legal right to sign a development contract with respect to the Caspian Sea. The Soviet Union and Iran signed two treaties in 1921 and 1940 which call for mutual agreement concerning the development of any of the Caspian's resources. Russia contends that those treaties now should bind the littoral states of Azerbaijan, Kazakhstan, and Turkmenistan to the same terms. The Russian Ministry of Foreign Affairs also has pointed out that each country legally cannot claim territorial rights to the Caspian Sea because international maritime law does not extend to "closed reservoirs" such as in this case.

In early 1994, the shallow water sections of Guneshli were withdrawn from negotiations with the BP consortium and were given to Lukoil, ostensibly under Russian influence. Additionally, the Russian oil company was allotted a 10 percent stake in the Caspian oil deal which formerly had been allotted to SOCAR. In September 1994, Russia pressed for a new regional treaty on mutual economic cooperation in the Caspian. This treaty was drafted in mid-October 1994 and, if ratified, may affect Azerbaijan's future revenues from development of any Caspian Sea oil fields.

### **Pipeline construction**

There is no export pipeline for future production from the Azeri, Chirag, and Guneshli fields, and construction of a line will add approximately \$1.5-2 billion in investment on top of the \$8 billion cost of the deal. Five alternative routes are under consideration at present, but each choice has political

and/or security risks. The first two options would send crude from the new fields through Iran either to the Persian Gulf or to the Turkish port of Ceyhan on the Mediterranean. Two other possibilities entail running a pipeline through politically unstable regions of Georgia or Armenia.

Another export route is through the Russian port of Novorossiysk on the Black Sea. This choice is heavily favored by Russia, which stands to earn \$480 million a year in transit fees at maximum production. However, the Turkish government is wary of any increase in tanker traffic through the Bosphorus, which already handles 1.6 million bbl/d in traffic. One compromise under consideration is the routing of Azeri oil to Novorossiysk, where it would be transported by tanker across the Black Sea to Turkey and then shipped 140 miles overland for export from Ceyhan.

A swap arrangement with Iran is one solution under consideration for exporting crude from the new fields before a pipeline is constructed. Part of the deal would include transporting crude from Azerbaijan to the Tabriz refinery in northern Iran, where the refined product would be sent to the Persian Gulf for pick-up at the Iranian port of Ganaveh. Swaps with Iran

using Azeri and Kazakh crudes have been used in the past. Iran also has purchased distillates from Azerbaijan to meet energy requirements in northern Iran and its Caspian provinces.

### **REFINING**

Traditionally, all Azeri crude has been refined domestically before export. There are two refineries in Azerbaijan with a total capacity of 406,000 bbl/d and a capacity utilization rate of 80 percent. The Kasporneftegaz refinery was constructed about 1930 and has a 244,000 bbl/d capacity. It is used almost exclusively for processing output from offshore fields. The Novo-Baku refinery was built in 1953 and typically is used to process onshore production, West Siberian crude transported through the Grozny-Baku pipeline, and Turkmen crude imported by tanker. The domestic Azeri market consumes 140,000 bbl/d in refined products, and petrochemical plants use another 40,000 bbl/d. New conversion capacity has been added recently with a new catalytic cracker and a primary distillation unit. This was necessary as Azerbaijan is importing increasingly heavier crudes, such as Mangyshlak crude from Kazakhstan.

### **NATURAL GAS**

In 1993, Azeri gas production declined by 15.2 percent, and Azerbaijan continued to import natural gas from Turkmenistan and Russia. In early 1994, Turkmenistan cut off gas delivery for a short time because of a \$38 million non-payment for Turkmen gas delivered in 1994. An agreement which in part involved exchanging consumer durables, food, and industrial equipment for gas was signed, but Azerbaijan still owes Turkmenistan over \$80 million in back-payments.

Iran and Azerbaijan agreed in mid-1994 to export Iranian natural gas to the region of Nakhichevan. This project will involve laying a \$17 million, 45-mile pipeline which will transport 283 million cubic feet (mmcf) of gas per day. Completion is planned before the end of 1996. Azerbaijan will pay for the pipeline with both crude oil exports and with convertible currency.

## **Canada**

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### **COUNTRY OVERVIEW**

**Prime Minister:** Jean Chretien (since 11/4/93)

**Independence:** July 1, 1867 (from UK)

**Population (7/94):** 28.1 million

**Location/Size:** Northern North America/9,976,140 sq km (3.85 million sq mi), slightly larger than United States

**Major Cities:** Toronto, Montreal, Vancouver, Ottawa (capital), Edmonton, Calgary, Winnipeg, Quebec

**Languages:** English (official), French (official)

**Ethnic Groups:** British Isles origin (40%), French origin (27%), other European (20%), indigenous Indian, Eskimo (1.5%)

**Religions:** Roman Catholic (46%), Protestant (41%)

**Defense:** Army (20,000), Navy (12,500), Air Force (20,600), Unspecified (25,000)

### **ECONOMIC OVERVIEW**

**Currency:** Canadian Dollar (Can\$)

**Exchange Rate (11/12/94):** 1 Can\$ = \$0.736 U.S.

**Gross Domestic Product (GDP) (1993):** \$618 billion

**Real GDP Growth Rate (1994E):** 3.8 percent

**Inflation Rate (1994E):** 0.1 percent

**Current Account (1993):** -\$19.6 billion

**Merchandise Exports (1993):** \$144 billion

**Merchandise Imports (1993):** \$134 billion

**Major Export Products:** Newsprint; wood pulp; timber; crude oil; machinery; natural gas; aluminum; motor vehicles and parts; telecommunications equipment

**Major Import Products:** Crude oil; chemicals; motor vehicles and parts; durable consumer goods; computers; telecommunications equipment

**Major Trading Partners:** United States, Japan, Mexico

**External Debt (1993):** \$435 billion

**Total Reserves (non-gold) (6/94):** \$11.6 billion

### **ENERGY OVERVIEW**

**Minister of Natural Resources:** Anne McLellan

**Proven Oil Reserves (1/1/94):** 5.1 billion barrels

**Oil Production (1994E):** 2.3 million barrels per day (MMbbl/d); of which 1.7 MMbbl/d is crude oil

**Oil Production Capacity (1994E):** 2.3 MMbbl/d

**Oil Consumption (1994E):** 1.7 MMbbl/d

**Crude Refining Capacity (1/1/94):** 1.9 MMbbl/d

**Net Oil Exports (1994E):** 0.6 MMbbl/d

**Natural Gas Reserves (1/1/94):** 94.8 trillion cubic feet (tcf)

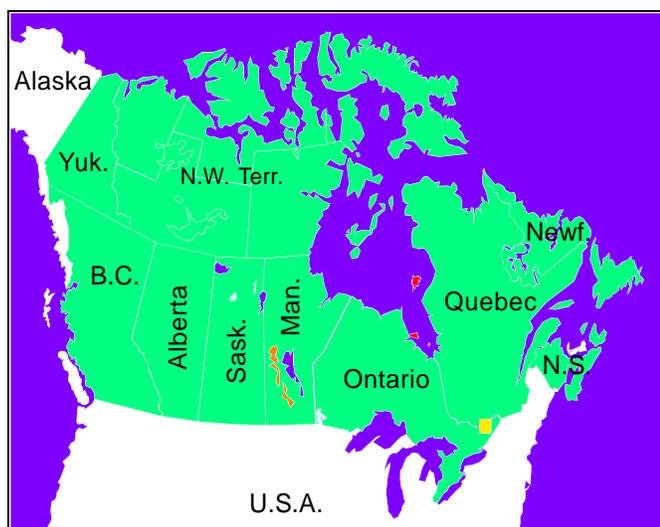
**Natural Gas Production (1993E):** 5.0 tcf

**Net Gas Exports (1993E):** 2.2 tcf

**Coal Reserves (1/1/91):** 9.5 billion short tons

**Coal Production (1993E):** 76 million short tons

**Net Coal Exports (1993E):** 33 million short tons



**Electric Generation Capacity (1993):** 108 gigawatts  
**Electricity Production (1993):** 511 terawatthours  
**Net Electricity Exports (1993):** 35 terawatthours

### ENVIRONMENT OVERVIEW

**Total Energy Consumption (1992):** 11 quadrillion Btu  
**Energy Consumption per 1985 Dollar of GDP (1991):** 26,000 Btu (vs. U.S. average of 18,000 Btu)

**Energy Consumption per Capita (1992):** 402 billion Btu (vs. U.S. average of 322 billion Btu)

**Energy-related Carbon Emissions (1992):** 135 million metric tons (one tenth of U.S. emissions)

**Carbon Emissions per 1985 Dollar of GDP (1991):** 0.32 metric tons (vs. U.S. average of 0.29 metric tons)

**Carbon Emissions per Capita (1993):** 4.9 metric tons (vs. U.S. average of 5.3 metric tons)

**Major Environmental Issues:** Canada ranks seventh among the world's industrialized countries in per capita production of solid wastes. Acid rain is a widespread problem, affecting many lakes and forests. Smelting of aluminum and other metals results in release of pollutants. Environmentalists also point to damage done by Canada's extensive hydroelectric, oil, and gas development. Canada has pledged to stabilize carbon emissions at 1988 levels by 2005. Note: Canada's relatively high energy use per dollar of output results largely from its reliance on energy-intensive industries based on the use of cheap and abundant hydroelectric power.

### OIL and GAS INDUSTRIES

**Organization:** The Canadian government maintains a 70% stake in Petro-Canada. Although the company has pressed for full privatization, the government has not addressed the issue.

**Major Oil and Gas Producing Provinces:** Alberta; Saskatchewan

**Major Oil Pipelines:** Trans Mountain; Interprovincial  
**Major Oil Refining Provinces (Capacity):** Ontario (535,400 bbl/d); Alberta (389,800); Quebec (347,400); New Brunswick (237,500 bbl/d)

**Major Gas Pipelines:** TransCanada PipeLines Ltd., Calgary, owns 8,451 miles of mainline gas pipelines in Canada. In 1993, TransCanada shipped 2.1 tcf of gas.

### GENERAL BACKGROUND

On October 25, 1993, Canada's Liberal Party, led by Jean Chretien, decisively defeated the Progressive Conservative Party of Prime Minister Bonnie Campbell (and the social democratic New Democratic Party, or NDP) in federal elections, after nine years as the opposition party. This election left the separatist Bloc Quebecois as the major opposition to the Liberal Party government.

To date, Liberal Party rule does not appear to have had a major impact on Canada's energy industry. Although previous Liberal Party governments (in the early 1980's) had instituted a highly regulated National Energy Program (NEP), which was unpopular in Canada's energy sector, and although Liberal Party ideology has opposed free trade agreements in the past, current government policy appears both pro-NAFTA (North American Free Trade Agreement) and anti-regulation.

### OIL

Canadian oil output defied pessimistic predictions and actually increased over the last decade, from 1.4 MMbbl/d in 1984 to an estimated 1.8 MMbbl/d in 1993. This increase occurred despite setbacks suffered during the 1980's (including the NEP and the oil price collapse of 1986). Given the lower oil price environment after 1986, Canada's oil industry concentrated during the late 1980s primarily on restructuring and downsizing operations. Beginning in the early 1990s, however, Canada's oil industry began a strong recovery.

Besides successes in cost cutting, the recovery in Canada's oil industry resulted largely from improvements in exploration (i.e., seismic techniques), drilling (particularly horizontal drilling), and production technology (including drill bits, drill rigs, production equipment, and recovery technologies). Largely as a result of these improvements, Canadian

oil production increased about 10% between 1990 and 1993. In addition, drilling activity more than doubled during this period, from about 2,000 wells drilled in 1990 to more than 4,200 wells drilled in 1993.

Increased Canadian oil output during the early 1990's consisted largely of conventional heavy oil and synthetic oil. Conventional heavy crude oil (with a gravity of 26° API or less) is produced entirely in western Canada, with 60% coming from Alberta and 40% from Saskatchewan. Production of this oil has increased since the early 1980's, primarily as a result of improved technology and increased demand from U.S. refiners.

Canada produces a significant amount of synthetic oil (about 33° API gravity) from bitumen. To date, 1.1 billion barrels of synthetic crude oil has been recovered from western Canadian oil sands (out of a potential 100 billion barrels in recoverable reserves). Plant modifications and improved technology have combined to lower operating costs at the Suncor oil sands plant in Alberta from \$15/barrel in 1992 to \$12/barrel in 1993, and a projected \$9/barrel in 1997.

Improved technology has also opened up offshore oil areas to development. The Hibernia Field (located offshore Newfoundland in 250 feet of water), for instance, contains 615 million barrels of light, waxy oil. The field is being developed in a \$6.5 billion project by a consortium of companies including Mobil, Chevron, and Murphy, plus large subsidies from the Canadian government. Production is scheduled to begin in 1997, with peak production estimated at 125,000 bbl/d.

Canadian oil production in 1993 consisted of 49% light oil, 29% heavy oil (including bitumen), 14% synthetic oil, and 8% other liquids. Although nearly all of this oil is produced in western Canada (primarily Alberta), the oil is consumed primarily in central and eastern Canada and in the United States. This fact necessitates an extensive system of pipelines connecting oil producing and consuming areas. This system is dominated by two major pipelines: 1) the Interprovincial Pipe Line (IPL), which delivers oil from Edmonton east to Montreal, Quebec, and the U.S. Great Lakes region; and 2) the Trans Mountain Pipe Line (TMPL), which delivers oil mainly from

Alberta west to refineries and terminals in the Vancouver area, as well as to the Puget Sound area of Washington state.

Canada exported 925,000 bbl/d of crude oil in 1993, including 529,000 bbl/d of light crude and about 397,000 bbl/d of blended heavy crude. Alberta alone accounted for around three quarters of total Canadian crude oil exports in that year. NAFTA, which took effect January 1, 1994, primarily reaffirms provisions of the 1989 U.S.-Canada Free Trade Agreement (CFTA) and is expected to have little additional impact on U.S.-Canadian oil trade.

### **REFINING**

Canadian refineries are able to process 1.9 million barrels per day of crude oil. Nearly two-thirds of this capacity is concentrated in three provinces - Ontario (535,400 bbl/d), Alberta (389,800 bbl/d), Quebec (347,400 bbl/d) - with the remainder distributed across Canada's other six provinces.

### **NATURAL GAS**

Canada contains 68.6 Tcf of natural gas reserves, located mainly in energy-rich Alberta province. Canada currently produces about 5.0 tcf of natural gas per year, forecast to increase to 6.0 tcf by 2005.

Canadian natural gas exports to U.S. non-utility electric generators increased from none in early 1990 to more than 54 billion cubic feet in the 2nd quarter of 1994. Overall, Canadian natural gas exports to the United States are expected (by Canada's National Energy Board) to grow from 2.5 tcf in 1994 to 3.4 tcf in 2006, before falling to 2.8 tcf in 2011.

Opposition to natural gas exploration, production, and transmission has grown in recent years. Environmental groups are opposing construction of a proposed 620-mile, 737-million-cubic-feet-per-day, natural gas pipeline to Wyoming. In addition, the Rocky Mountain Ecosystem Coalition is attempting to slow the expansion of natural gas exploration and production activities in northern Alberta.

Environmentalists have also tried, with some success, to block Amoco Canada, Ltd. from drilling in the ecologically sensitive "Whaleback" region, located about 75 miles southwest of Calgary. On September

8, 1994, Alberta's Energy Resources Conservation Board (ERCB) ruled against Amoco, marking a major victory for environmental groups and local ranchers opposed to Amoco's plans.

Canadian natural gas is transported largely by TransCanada PipeLines Ltd, Calgary, which owns 8,451 miles of mainline gas pipelines in Canada, along with 56 compressor stations, linking western Canadian gas producers with eastern Canadian and U.S. consumers. In 1993, the TransCanada system shipped a record 2.1 tcf of natural gas (up from 1.4 tcf in 1989), including 1.2 tcf to Canadian markets and 0.9 tcf to the United States.

In June 1994, the U.S. Federal Energy Regulatory Commission dismissed a claim by three Canadian natural gas producers that California's ban on gas "crossovers" from the new Pacific Gas Transmission system (between Canada and California) and the older, less expensive Pacific Gas and Electric Co. system, was unfair. Extra costs to Canadian gas producers as a result of the "crossover" ban have been estimated at \$40 million per year.

### **COAL**

Canada is the world's tenth largest coal producer, with output in 1993 of about 76 mmst, more than half of which was exported. Canada ranks fourth among coal exporting countries. Alberta accounts for about half of Canada's coal production, while British Columbia and Saskatchewan account for about 30% and 15%, respectively, of total production. In 1993, Canada exported 31 mmst of coal, with nearly 80% purchased by two Far Eastern countries (Japan and South Korea).

As of 1993, bituminous coal accounted for around half of Canada's coal production, with sub-bituminous and lignite accounting for 34% and 15%, respectively. In that year, nearly 90% of coal was consumed in electricity generation, with 13% accounted for by steel production and other uses.

### **ELECTRIC POWER**

Canada generated 511 terawatt-hours (TWh) of electricity in 1993, exporting 35 TWh. Overall, more than 62% of Canada's electricity in 1993 was generated by hydroelectric plants, about 17% by

nuclear, 15% by coal, and 5% by oil and gas. Quebec and Ontario produced the most electricity - 154 and 141 TWh, respectively - in 1993. Nearly 97% of Quebec's electricity generation derives from hydro plants, with the remaining 3% produced mainly by nuclear facilities. In contrast, about 56% of Ontario's electric power production derives from nuclear, 29% from hydro, and 14% from coal-fired plants.

The majority of Canada's electricity exports originate in the eastern provinces of Quebec, Ontario, and New Brunswick and are sold to consumers in New England and New York. The western provinces of British Columbia and Manitoba also export large amounts of electricity, mainly to Washington State, Minnesota, California, and Oregon. Except for Alberta, all Canadian provinces bordering the United States have transmission links to neighboring U.S. systems. Canadian electricity exports to the United States surged in late 1993 and early 1994, due largely to favorable hydrological conditions.

On November 18, 1994, Quebec Premier Jacques Parizeau abruptly announced cancellation of the controversial \$10 billion Great Whale hydroelectric power project. Under discussion since the mid-1970's, Great Whale called for construction of a network of dams and hydro plants in remote northern Quebec. The plan has been opposed by environmental groups, as well as Cree Indians and other native groups in the region. In March 1994, Great Whale was dealt a severe setback when New York's Power Authority, a major Hydro-Quebec customer, announced cancellation of a \$5 billion power contract, citing environmental concerns and decreased power needs.

# China

## COUNTRY OVERVIEW

**Chief of State and Head of Government (de Facto):** Deng Xiaoping

**President and Secretary General of the Communist Party:** Jiang Zemin

**Premier:** Li Peng

**Population (July 1993):** 1.18 billion

**Location/Size:** Located in East Asia, coastline on the Pacific Ocean/9,596,960 sq km (3,704,426 sq mi), slightly larger than the United States.

**Ethnic Divisions (1993):** Han Chinese (92%); Buyi, Hui, Korean, Manchu, Miao, Mongol, Tibetan, Uygur, Zhuang, and all other nationalities (8%)

**Languages:** Mandarin (standard Chinese), Cantonese, Shanghainese (Wu), various minority languages and dialects

**Major Cities:** Beijing (capital), Shanghai, Tianjin, Shenyang, Wuhan, Canton

## ECONOMIC OVERVIEW

**Gross Domestic Product (1994E):** \$2.61 trillion

**Currency:** Renminbi (Yuan)

**Exchange rate (7/94):** US \$1 = 8.64 Renminbi. Foreign currency is exchanged for Yuan, which is equivalent to the domestic Renminbi.

**Major Trading Partners:** Hong Kong, Japan, United States, Germany, Commonwealth of Independent States, Italy

## ENERGY OVERVIEW

**Minister of Foreign Trade and Economic Cooperation (MOFTEC):** Li Lanqing

**Minister of Water Resources:** Niu Maosheng  
China abolished the Ministry of Energy in early 1993 and reorganized its energy industries as follows:

**Minister of Power Industry:** Shi Dazhen

**Minister of Coal Industry:** Wang Senhao

**Proven Oil Reserves (1/1/94):** 24 billion barrels

**Oil Production (1993E):** 2.9 million barrels per day (bbl/d)

**Domestic Oil Consumption (1993E):** 2.9 million bbl/d

**Refinery Capacity (1993E):** 3.3 million bbl/d

**Refinery Throughput (1993E):** 2.6 million bbl/d

**Proven Gas Reserves (1/1/94):** 59 trillion cubic feet (tcf)

**Natural Gas Production (1992E):** 0.5 tcf

**Natural Gas Consumption (1992E):** 0.5 tcf

**Coal Production (1992E):** 1226 million short tons (MMst)

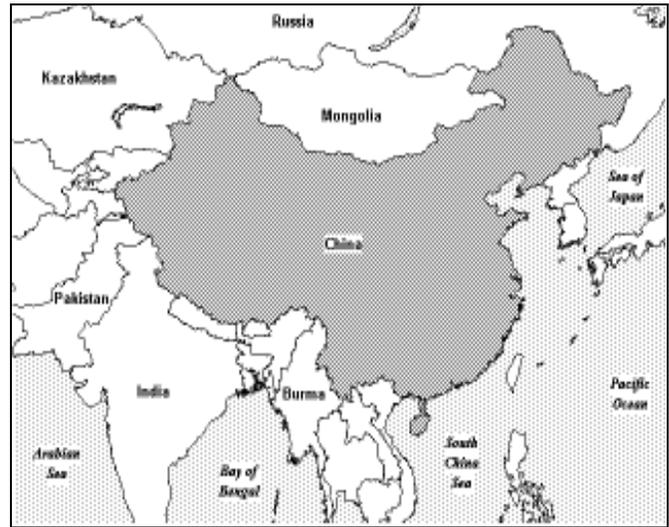
**Coal Consumption (1992E):** 1204 MMst

**Major Coal Fields:** Shaanxi-Gansu-Ningxia Basin (northern China) Electricity Generation (1991): 643 billion kilowatt-hours (kWh)

**Electricity Consumption (1992):** 682 billion kWh

**Installed Electric Capacity (1993E):** 176,000 Megawatts (MW)

**Nuclear Power Plants (Capacity in Megawatts, or MW):**  
*Operating:* Qinshan Unit 1, Zhejiang Province (300 MW); aya Bay Unit 1, Guangdong Province (900 MW); *Under Construction:* Daya Bay Unit 2, Guangdong Province (900 MW; expected opening end of 1994) and Daya Bay Unit 2 (930 MW; expected opening end of 1994)



## OIL AND GAS INDUSTRIES

**Oil and Gas Organizations:** China National Petroleum Corporation (CNPC) - onshore and shallow offshore exploration and development; China National Oil and Gas Exploration and Development Corporation (CNODC) - formed by CNPC and responsible for exploration tenders for Tarim and other basins; China National Offshore Oil Corporation (CNOOC) - deep offshore; China National Petrochemical Corporation (SINOPEC) - refining; China National Chemicals Import and Export Corporation (SINOCHEN) - under MOFTEC and responsible for oil trading; China United Petroleum Corporation (China Oil) - a joint venture of CNPC and SINOCHEN created in 1993 to oversee the import and export of crude; China United Petrochemical Corporation (UNIPEC) - a joint venture of SINOCHEN and SINOPEC created in 1993 to import crude and export products for China's refineries.

**Major Oil Fields:** Daqing (Northeast China) and Shengli (Central China) account for almost 2/3 of China's production. Liaohi (Northeast China) accounts for 10%, while Dagang, Huabei, and Zhongyuan (Central China) together account for 12%. Major fields (mostly undeveloped) are believed to lie in the Junggar, Tarim, and Turpan-Hami Basins in the Xinjiang Autonomous Region in far northwestern China.

**Major Crude Tanker Terminals:** Zhoushan, Huangdao,

Aoshan, Zhenhai, Dalian, Xiaocuo, Qinhuangdao (export terminal), Zhanjiang, Qingdao (export terminal)

**Major Refineries (1/1/94):** *Government owned:* Anshan, Beijing, Hangzhou, Karamai-Dushanzi, Lanchow, Lenghu, Nanchong, Nanjing, Shanghai, Shengli, Tianjin and Yumen  
*Private Sector:* Balin (100,000 bbl/d), Dalian (100,000 bbl/d), Daqing (120,000 bbl/d), Fushun #2 (90,000 bbl/d), Gaoqiao 104,000 bbl/d, Guangzhou (104,000 bbl/d), Jinlin (140,000 bbl/d), Jinxi (100,000 bbl/d), Maoming (170,000 bbl/d), Qilu (160,000 bbl/d), Yanshan (140,000 bbl/d)

**Major Gas Fields:** Sichuan Basin is the largest producing area; Yinggehai Basin (offshore) is China's largest in terms of reserves; underdeveloped Shaanxi-Gansu-Ningxia (formerly Ordos) Basin (northern China) is expected to become China's largest producing area.

**Major Customers:** Japan, Hong Kong, South Korea, North Korea, France, Philippines, Indonesia, Malaysia, Taiwan

### **GENERAL BACKGROUND**

China is the world's third largest producer and consumer of energy, trailing only the United States and the former Soviet Union. In 1992, China generated over 11% of the world's carbon emissions although its economy accounted for less than 3% of the world's total GDP. China is using a combination of market reforms and environmental management strategies to reduce carbon emissions. However, it lacks the capability to fully overhaul its power plants and other sources of carbon and sulfur emissions without outside financial and technical help.

China plans to increase its oil exploration efforts on the edge of its continental shelf, particularly near the Spratly and Paracel Islands. Development of these areas is complicated, however, by conflicting national sovereignty claims. Six different nations (Brunei, China, Malaysia, Philippines, Taiwan, and Vietnam) claim the Spratly Islands in part or in whole, while both China and Vietnam claim the Paracels. Although China, the Philippines, and Taiwan agreed to settle their differences by jointly developing the area, the situation has continued to be a point of conflict. In May 1992, China signed a contract with Crestone Energy to explore some blocks near the Spratlys. Vietnam called on China to rescind its oil exploration contracts, with Crestone claiming that the area being explored was on Vietnam's continental shelf. Crestone responded by announcing that it will continue its survey work in the area under the protection of the Chinese navy. In April 1994 Mobil

Oil signed an exploration contract with Vietnam to develop the area just west of the Spratlys known as Blue Dragon. China has denounced the contract as illegal. Territorial disputes have also arisen with Japan and Taiwan in the East China Sea.

China's eight-year long negotiations to rejoin the General Agreement on Tariffs and Trade (GATT) may soon produce some results. Although China was a founding member of the group, it left GATT in 1950 when the Communist government came to power. The Chinese government regards membership in GATT and its successor, the World Trade Organization (WTO), as one of its top objectives. In addition, many state-owned firms, including energy industries, are being deregulated. While China is still insisting on government ownership of large industrial enterprises, it is decentralizing decision-making and giving enterprises the freedom to act on their own to make profits and increase efficiency. Chinese trade officials are optimistic that the recent changes in the country's duty policies and its adoption of a new Foreign Trade Law could bring China back into GATT by the first part of 1995.

President Clinton announced in May 1994 that he would extend China's most favored nation status for another year.

### **OIL**

With oil demand expanding rapidly, China has become a net importer of crude and products. According to the *Oil & Gas Journal*, imports of crude oil averaged 203,000 bbl/d in the first five months of 1994 (products averaged 303,000 bbl/d) compared to 177,000 bbl/d for the same period in 1993 (products flowed in at 127,000 bbl/d). On May 1, 1994, in an attempt to stem the massive uncontrolled imports that were hurting local refiners, China imposed a reform package that raised the price of crude oil, unified the price of domestically-refined products and placed restrictions on imported products. From May 1 until July 1, no imports of crude or light products were allowed, although some apparently slipped through. Since July 1, only Sinochem and Unipet have been granted licenses to import crude oil and light products.

### **Exploration and Development**

China announced recently that it is, for the first time, allowing foreign oil and gas exploration in the Tarim basin, a potentially huge oil and gas producing area in the northwestern part of the country. Located in the Xinjiang province, Tarim is not an established producing area but estimates show the basin could produce from 10 to 30 billion barrels of oil. A consortium led by Exxon was awarded an exploration contract at the end of 1993. China National Petroleum Corporation has also awarded exploration contracts to two other groups. The first group, comprised of Agip, Elf, Texaco, Japan Petroleum Exploration, and Japan Energy, was started in early 1994. In March 1994, British Petroleum, Mitsubishi, Itochu, and Japan Exploration were jointly awarded a contract to explore a 7,334 sq. mi. (19,000 sq. km.) field in block 4 of the Tarim basin. Although prospects for oil finds in the Tarim basin appear good, its proximity to markets make it less profitable. Located in the northwest of the country, the oil would have to be transported across difficult terrain to the more populated east coast to reach a viable market or to be exported.

Chinese geologists recently discovered a new field in the Turpan-Hami basin in Xinjiang province. The field, known as Santanghu, or "the Three Ponds," covers 20,000 sq km (7,720 mi) and is estimated to hold reserves between 700 million and 1.4 billion barrels of light crude. Like the Tarim basin, the field is at a disadvantage due to its distance from major markets and export points.

### **Production**

Recently, for the first time in nearly thirty years, China's oil production failed to meet the demands of the local economy, forcing China to become a net importer of oil, despite increases in production at many fields. Due largely to rapid economic growth, particularly in the special economic areas near Hong Kong, demand for crude oil and petroleum products has accelerated in recent years.

Although China is currently a net oil importer, on-and-offshore production continues to increase. Offshore production reached 126,650 bbl/d in the first quarter of 1994, up from 119,000 bbl/d in 1993. Onshore production is expected to reach 3 million bbl/d in 1995. Production at the largest and more

mature fields has continued to increase with the introduction of Enhanced Oil Recovery (EOR) techniques and more efficient transportation.

In the Northeastern field of Daqing, currently China's largest, oil production reached 1.15 million bbl/d in the first quarter of 1994, slightly over last year's production. Production is expected to remain at about 1.15 million bbl/d through 1995, then decline to about 1 million bbl/d through the end of the century. Daqing now represents almost 40% of China's total oil production.

First quarter production at the Liaohe oil field is up 5.4% this year to 300,000 bbl/d, while Xingjiang and Dagang both reached 163,000 bbl/d.

### **REFINING**

According to a Sinopec official, China plans to increase its crude oil processing capacity to 4.6 million bbl/d by the turn of the century and to 6 million bbl/d by 2010. In response to rapidly increasing domestic demand for refined products, China has embarked on several projects to upgrade existing refineries and build new facilities. Emphasis is being placed on expanding existing refineries and improving product quality.

Sinopec is planning to initially upgrade the refineries at Dalian, Zhenhai, Maoming, Fujian, Gaoqiao, Jinling, and Guangzhou. Each of these refineries will have a minimum of 200,000 bbl/d of crude distilling capacity after the upgrades. The refineries will then be able to process the higher sulfur content of imported crudes. Most Chinese refineries were designed to accommodate low sulfur domestic crude.

One of the first refineries to be revamped will be the Maoming Petrochemical Corp. (MPC) refinery complex. The complex will receive a new hydrocracker that will enable it to refine higher sulfur crude.

China's first refinery with foreign participation will be located at Dalian. The 100,000 bbl/d joint venture refinery (Dalian municipality, 27%; Sinochem, 22.5%; Total, 20%; Daqing municipality, 15%; Ministry of Chemical Industry, 10%; and Sinochem, 5%) is scheduled to come on-line in mid-1995.

South Korea's Yukong has signed a deal with Sinopec to conduct a feasibility study for a new 100,000 bbl/d refinery. The \$1.5 billion refinery is to be built in Shenzhen in southern China. Studies are also underway for the 300,000 bbl/d refinery at Shandong. That refinery will be a joint venture between Saudi Aramco (48%), Sinochem (18%), South Korea's Ssangyong (20%) and the Shandong municipal government (18%).

China National Petroleum Corporation completed its 20,000 bbl/d Gulum refinery in northwestern Qinghai province in September 1993. This refinery brought the company's capacity to 220,000 bbl/d. China National Petroleum Corporation also has plans to upgrade its refineries to reach a capacity of 500,000 bbl/d by the end of the decade.

### **Transportation**

China has opened its first oil terminal capable of handling tankers larger than 200,000 dead-weight-tons. Since becoming a net importer of crude, the need for terminals that can handle large vessels has increased. This new terminal at Zhoushan in southern Zhejiang province cost \$30 million and three years to build. Chinese authorities now plan to expand the terminal to nearly double its current size. The complex includes a 1.9 million barrel capacity tank farm.

Zhenhai General Petrochemical Works, a state-owned company, says it plans to increase the size of its terminal near Ningbo in Zhejiang to accommodate vessels up to 250,000 dead-weight-tons. Completion of the project is expected by the end of 1994.

### **NATURAL GAS**

China is slowly raising natural gas prices to world levels to help encourage foreign investors to participate in the development of the country's vast natural gas reserves. Although independent sources put China's reserves at about 59 trillion cubic feet, Chinese officials insist that the reserves are much higher, at 1,164 trillion cubic feet. China plans to marginally boost production of natural gas this year to 565 billion cubic feet.

### **Exploration and Development**

China's biggest offshore natural gas field, Yacheng, is expected to begin supplying gas to Hong Kong and Hainan by 1996. About a quarter of the 620-mile (1,000-km) underwater pipeline has already been laid. Yacheng was discovered in 1983 by a consortium including China National Offshore Oil Corporation, Atlantic Richfield Corp., and the Kuwait National Petroleum Corp. The group is developing the gas field together and predicts that it will produce 326 million cubic feet per day sustainable for 20 years. Cost for the development has been estimated at \$1.2 billion. Most of the gas, 277 million cubic feet per day, will be piped to a 30-million-kilowatt power plant near Hong Kong. The remainder will supply the Hainan island province. The field is believed to hold about 3.5 trillion cubic feet.

### **COAL**

Not only is China the world's largest producer of coal, its economy is also dominated by the fuel, which supplies about 76% of China's energy needs. On January 1, 1994, China lifted all price controls on coal, a year ahead of schedule.

In its new five-year plan, China's Ministry of Coal Industry aims at boosting coal production from 1,226 million tons per year to 1,500 million tons per year by the year 2000. As a part of this effort the plan calls for greater cooperation and technical exchange with foreign countries and the closure of mines that are not economically viable.

China's first plant to produce gasoline from coal started up in December 1993 at Jincheng in Shanxi province. The plant also produces liquefied coal gas.

## **ELECTRIC POWER**

China produced 211 billion kilowatt hours of electricity in the first quarter of 1994. According to officials this is about 24% of the planned annual target of 890 billion kilowatt hours and about 10% more than the amount produced in the same period last year. The Ministry of Power Industry expects another 10% increase in power production in the second quarter.

With demand for electricity rapidly increasing, China plans to build about 30 new power plants per year for at least the next ten years. Plans are to increase China's installed electric capacity from 176,000 megawatts in 1993 to 300,000 megawatts by 2000 and to 800,000 megawatts by 2020. Most of these plants will be coal-fired, but other energy sources are also being developed.

### **Hydroelectric Power**

China is moving to diversify its energy usage away from coal by further developing its large hydroelectric potential. China has five times the hydropower resources as the United States, yet it has developed only about 1% of its potential. China has an ambitious expansion project underway to increase its installed hydroelectric capacity. Currently, there are over 150 hydroelectric projects under construction, including several on the Yellow and Yangtze rivers. The most significant project, the proposed Three Gorges dam along the Yangtze river, would be the world's largest if completed.

Construction cost estimates for the planned 18,000 megawatt plant vary widely, from \$11 billion to \$35 billion. Construction on the 1.2-mile (1.9-km) wide dam and hydroelectric station, which is expected to begin this year, is forecast to take 17 years to complete. Opponents of the project claim that the 185 meter (600 ft) dam would flood thousands of acres of productive agricultural land and threaten several endangered species, such as the giant panda and river dolphin. The reservoir that will be created behind the dam will displace over 1.2 million people and flood an area stretching 600 kilometers.

# Colombia

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## **COUNTRY OVERVIEW**

**President:** Ernesto Samper

**Population (1994E):** 35.6 million

**Location/Size:** NW South America/1,138,910 sq km (439,619 sq mi), approximately the size of Texas, New Mexico and Louisiana combined

**Language:** Spanish

**Religion:** Roman Catholic (95%)

**Ethnic Divisions:** Mestizo, White, Mulatto, Black, Indian

**Defense:** Army (120,000); Navy (13,000); Air Force (7,000); Paramilitary Police (85,000)

**Major Cities:** Bogota (capital), Medellin, Cali

## **ECONOMIC OVERVIEW**

**Gross Domestic Product (1993E):** \$192 billion

**Monetary Reserves (6/93, non-Gold):** \$7.9 billion

**Currency:** Peso

**Exchange Rate (8/94):** US \$1 = 814 pesos

**Current Account Balance (1993):** -\$2.24 billion

**Total Foreign Debt (1993):** \$17 billion

**Petroleum Revenues (1993):** \$1.32 billion

**Petroleum Revenues/Total Export Revenues (1993):** 19%

**Import Products:** Industrial inputs, capital goods, consumer goods

**Export Products:** Petroleum, coffee, coal

**Major Trading Partners:** United States, Germany, Venezuela, Japan, France

## **ENERGY OVERVIEW**

**Minister of Mines and Energy:** Jorge Eduardo Cook

**Proven Oil Reserves (1/1/94):** 3.0 billion barrels

**Oil Production Capacity (1Q94):** 500,000 bbl/d

**Total Oil Production (1993):** 456,000 bbl/d

**Domestic Oil Consumption (1993):** 230,000 bbl/d

**Net Petroleum Exports (1993):** 230,000 bbl/d

**Petroleum Exports to the U.S. (1993):** 81,000 bbl/d

**Refining Capacity (1/1/94):** 249,000 bbl/d

**Natural Gas Reserves (1/1/94):** 10 trillion cubic feet

**Natural Gas Production (1993E):** 130 billion cubic feet (Bcf)

**Natural Gas Consumption (1993E):** 121 Bcf

## **OIL and GAS INDUSTRIES**

**Organization:** State-owned Empresa Colombiana de Petroleos (Ecopetrol)

**Major Ports:** Covenas (Caribbean Coast), Puerto de Tumaco

**Major Fields:** Cusiana, Cupiagua, Cano Limon, Piedemonte, Rio Chitamina, Provincia

**Major Pipelines:** Cano Limon-Covenas (230,000bbl/d), Central Llanos (75,000 bbl/d), Colombia (150,000 bbl/d),

Trans-Andean (15,000 bbl/d)

**Major Refineries:** Barrancabermeja, Cartagena, Orito, Tibu

**Major Oil Companies:** Occidental, British Petroleum, Shell, Exxon, Texaco, Chevron, Total, and ELF

**Major Customers:** United States, European Community



### **GENERAL BACKGROUND**

In August 1994, Liberal Party candidate Ernesto Samper was inaugurated as president after one of the closest elections in Colombian history. He replaced ruling Liberal Party President Cesar Gaviria, who was constitutionally prohibited from running for a second term. President Samper is predicted to continue the economic liberalization programs begun by Gaviria in 1991. These have included privatization of state-owned enterprises, lowering of trade barriers, and liberalization of prices. These reforms contributed to the Colombian economy's high growth rate of 5.2 percent in 1993.

There are indications that economic reforms may proceed at a slower pace under Samper. While Samper plans to continue Gaviria's programs, the new president has stated that he does not intend to privatize the state oil company, Ecopetrol, and that he would like to retain the state's role in some other large industrial sectors. In addition, he plans to grant subsidies to workers who are affected adversely by privatization. Samper also pledges to create 1.5 million new jobs by using income generated by the

recently discovered Cusiana oil field to fund infrastructure projects and public services.

One economic problem facing Colombia is the appreciation of the Colombian peso relative to other currencies, and the resulting effect on Colombia's trade balance. Increased domestic demand brought about by fast economic growth, an influx of imports, a weakening of the export sector, and an excess of foreign exchange reserves have contributed to the growing trade imbalance. In 1993, for example, Colombian imports rose by over 50 percent whereas exports increased only 2.3 percent. In addition, the recent economic crisis in Venezuela, Colombia's major trading partner, resulted in a massive depreciation of the Venezuelan bolivar. This has further widened Colombia's trade gap. To avoid a revaluation of the peso, Samper plans to put an estimated 40 percent of the revenues generated from Cuisiana into an offshore account.

In June 1994, Colombia took steps to increase its regional trade relations with its signing of the Group of Three (G-3) trade pact with Mexico and Venezuela. Colombia also signed a free trade agreement in 1994 with the Caribbean Community (Caricom) which will begin reducing regional trade barriers next year.

Insurgency operations in Colombia continue to affect the energy infrastructure, and one multinational estimates that operating costs are 10 percent higher in Colombia due to security reasons alone. While there was a major guerrilla offensive prior to the presidential elections in mid-1994, there has been a general decrease in guerrilla activity since 1992. In 1993, the strategic Cano Limon-Covenas pipeline and the Colombian pipeline were bombed 49 times, resulting in repair and environmental costs of \$3.8 million. This compares to 82 bombings and costs of \$6.9 million in 1992. Part of the reason for this decrease was President Gaviria's \$100 million investment which created special military units in 1993 to guard pipelines, production, and exploration sites. This move was supplemented by the establishment of a "war tax" of \$1.10/barrel on oil production that is charged to multinationals for the support of the security forces. In an effort to make Colombia more attractive to foreign investors,

however, President Samper has indicated that he will either lessen or eliminate this tax.

## **OIL**

Since 1983, Colombia's oil industry has focused on the Cano Limon field in the eastern Llanos Basin near Venezuela. This field, with recoverable reserves of over one billion barrels, accounts for approximately 43 percent of the country's oil production. Despite the use of secondary recovery methods, such as water injection, output from Cano Limon is expected to drop from 200,000 bbl/d in 1993 to a projected 80,000 bbl/d by the year 2000.

The eventual loss of production from Cano Limon will likely be offset by the recent British Petroleum (BP) discovery of the Cusiana and smaller Cupiagua fields in the Llanos Basin. The fields are estimated to hold a combined total of over 2 billion barrels of recoverable oil reserves with crude density between 35° to 38° API. The fields are shared jointly by Ecopetrol (50%), BP (19%), Total (19%), and Triton Energy (12%). Production is expected to rise from 150,000 bbl/d in late-1995 to a possible maximum of 600,000-800,000 bbl/d by 1997. Cusiana's first producing well, Buenos Aires-1, has averaged 10,500 bbl/d and a total output of over 3.5 million barrels since late-1992. Drilling expenses in Cuisiana have reached \$25 million per well because of the reservoir's 20,000 foot depth. However, development costs are expected to average only \$2/barrel as compared with the more typical regional cost of \$5/barrel.

Over the lifetime of the project, investments totalling \$5.6 billion in development and production are foreseen. Additionally, several key infrastructure programs are anticipated. First, pipeline expansion is required to transport the crude to the port at Covenas. A proposed \$1.5 billion, 500,000 bbl/d, 756 km (470 mi) pipeline is projected for completion in 1997. Ecopetrol is seeking foreign financing for the pipeline from BP, Total, Triton, and other sources. BP already has undertaken a pipeline extension project from Cusiana to the 75,000 bbl/d Central Llanos pipeline at El Porvenir as well as construction of an additional loop to upgrade the 150,000 bbl/d Oleoducto de Colombia. These pipeline modifications, with a combined cost of \$300 million,

are projected for completion by the end of 1995. When finished, they will allow for adequate transportation of Cuisiana crude before the 500,000 bbl/d pipeline becomes operational. BP projects spending \$1 billion in the development of Cusiana and Cupiagua by 1995. Additionally, Ecopetrol is seeking private financing for an \$800 million, 100,000 bbl/d refinery as well as two 350,000 barrel storage tanks for use at the Covenas terminal.

Besides financing from private foreign investors, the Colombian government has taken several measures to raise the capital necessary for developing Cusiana. In November 1993, Ecopetrol procured a US Export-Import Bank loan for \$500 million. The Colombian government also plans to issue up to \$500 million worth of bonds. Privatization efforts contemplated to raise capital include the sale of thermoelectric and natural gas distribution plants. In late-1993, Ecopetrol sold its \$40 million stake in Terpel, the domestic gas marketing company, for this purpose.

In an effort to attract multinationals to Colombia, the government revised the tax structure on oil operations prior to its April 1994 bidding round. The main change to the Association Contracts between Ecopetrol and foreign companies was the creation of the *rentabilidad* (profitability), or "R" factor. Under the new arrangement, Ecopetrol's share of revenue will vary between 50 to 75 percent depending on the ratio of the partner's cumulative income to its cumulative exploration and development costs at a field. Another change was the provision that direct drilling costs of dry holes in any field that eventually becomes commercial will be reimbursed up to 50 percent, with limitations. Both of these amendments were designed to increase the incentive for firms to take financial risks in the exploration of smaller fields. A third change, which benefits primarily current contract holders, was a substantive reduction in pipeline tariffs.

The April 1994 bidding round consisted of 8 million acres near Cuisiana in the Llanos Basin, the Putumayo Basin, and the Upper Magdalena River Valley. Although some estimates of recoverable oil reserves in Colombia range as high as 8.6 billion barrels, only Esso Colombiana (Exxon), Total, and Kelt Energy bid on four of the 21 blocks offered.

According to Ecopetrol, part of the lack of interest was due to contractual restrictions as well as competition for investment in other countries, such as those in the former Soviet Union. Even with the new modifications, the rest of the tax structure on oil operations remains the same. In addition to Ecopetrol's 50 to 75 percent income from the "R" factor, the Colombian government receives a 20 percent royalty, an income tax of between 30 to 37.5 percent, a 12 percent remittance tax, and the \$1.10/barrel war tax. Receipts for the government usually total 85 percent of oil production revenue. However, joint ventures in Colombia are profitable for multinationals, and Ecopetrol announced in July 1994 that it was continuing talks with 32 other companies, including Mobil, Amoco, BP, Triton, and Heritage.

### **NATURAL GAS**

In August 1994, BP announced that it had tentatively discovered five trillion cubic feet of gas and 250 million barrels of condensate in the Llanos Basin. Volcanera, the field where the find was made, is expected to meet Colombia's 10 percent increase in gas consumption per year. BP also suggested that the gas from Volcanera would be valuable in helping to increase the recovery rates at nearby Cuisiana through gas injection methods.

In May 1994, Enron Corporation agreed to construct and maintain a 100 million cubic feet per day, \$190 million, 575 km (357 mi) pipeline to transport Ecopetrol's gas from Barrancabermeja to Ballena on the Caribbean coast. While Enron will not have rights to the gas, it will have 50% ownership of the pipeline with its other partners.

### **COAL**

Colombia is the world's eighth largest coal exporter and contains total proven reserves of 7.2 billion short tons. In 1993, the government-owned mining company, Carbocol, was divided into two separate entities: a new Carbocol; and Ecocarbon, which now performs regulatory duties. The new Carbocol, which received \$903 million in a debt/equity swap arrangement, is still in debt for over \$900 million. One option discussed was the sale of El Cerrejon Norte, Colombia's largest coal mine, which is jointly owned with Intercor, an Exxon subsidiary. Last year, the government had announced its intent to sell its \$1 billion stake in the mine, but it is now considering an investment of \$300 million through a debt write-off to expand the mine's capacity by one-third to 22 million short tons. Cost-reducing measures and improved utilization of infrastructure are also planned before the final decision to privatize is made.

# Ecuador

## COUNTRY OVERVIEW

**President:** Sixto Duran Ballen

**Population (1994E):** 10,677,067

**Languages:** Spanish (official), Quechua

**Religion:** Roman Catholic

**Location/ Size:** Northwestern South America/283,560 sq km (109,483 sq mi), approximately the size of Nevada

**Major Cities:** Quito (Capital), Guayaquil

**Defense (6/93):** Army 50,000; Navy 4,500; Air Force 3,500

## ECONOMIC OVERVIEW

**Gross Domestic Product (1993):** \$41.8 billion

**Monetary Reserves (4/94, non-gold):** \$1.35 billion

**Foreign Debt (7/94):** \$12.8 billion

**Currency:** Sucre

**Exchange Rate (8/94):** US \$1 = 2216 Sucre

**Current Account Balance (1993):** \$470 million

**Oil Export Revenues (1993):** \$1.15 billion

**Oil Export Revenues/Total Export Revenues (1993):** 40%

**Major Imports:** Transport equipment and vehicles

**Major Exports:** Petroleum, coffee, bananas

## ENERGY OVERVIEW

**Minister of Energy:** Francisco Acosta

**Proven Oil Reserves (1/1/94):** 2.0 billion barrels

**Oil Production Capacity (1Q94E):** 370,000 barrels per day (bbl/d)

**Oil Production (1993):** 346,000 bbl/d

**Domestic Oil Consumption (1993E):** 114,000 bbl/d

**Refining Capacity (1/1/94):** 148,000 bbl/d

**Gross Oil Exports (1993E):** 232,000 bbl/d

**Oil Exports to the U.S. (1993):** 78,000 bbl/d

**Natural Gas Reserves (1/1/94):** 3.8 trillion cubic feet

## OIL INDUSTRY

**Organization:** Petroecuador, formerly CEPE, serves as the holding company for all state-owned petroleum operations. Petroecuador's three subsidiaries manage all upstream and downstream activities in the country.

**Major Oil Customers:** United States, Japan, and Germany

**Major Ports:** Guayaquil, Esmeraldas, Manta, Puerto Bolivar

**Major Oil Fields:** Shushufindi, Pindo, Auca Sur

**Major Refineries:** Esmeraldas, La Libertad, Amazonas

**Major Pipelines:** Trans-Ecuadorean, Lago Agrio-Balao, Pindo-Auca

## GENERAL BACKGROUND

Following Ecuador's withdrawal from OPEC in late 1992, President Duran Ballen's government met stiff



political opposition during its 1993 attempt to restructure and privatize the country's oil industry. Although freedom from OPEC production quotas sparked some optimism for increased oil output and export revenues in 1993, Ecuador suffered from the worldwide decline in oil prices. Ecuador's government had projected prices of \$17/barrel for its Oriente crude export. When prices fell below \$10/barrel, the government experienced a \$500 million budget shortfall. In another development, Francisco Acosta replaced Pablo Baquerizo in August 1993 and became Ecuador's third Energy Minister in a year.

In December 1993, several oil industry reforms, as well as economic austerity measures, were passed after legislative battles and industry strikes. One crucial reform relevant to foreign oil companies operating in Ecuador was the Hydrocarbon Law. This law provides Petroecuador royalties of between 12.5 and 18.5 percent dependent on production, while reducing the corporate tax rate from 44 percent to 25 percent. The law also issues production sharing contracts at favorable terms that allow for the operation of pipelines, refineries, storage facilities, and other downstream activities. Additional reforms included a 71 percent increase in the domestic retail price of gasoline. Gasoline previously sold at around 30 percent of world prices and cost the government \$100 million a year in subsidies.

The Hydrocarbon Law and associated reforms are an

effort by the Ecuadorian government to narrow its current account deficit by increasing revenues from the oil export sector and to concurrently lower its \$12.8 billion foreign debt. Successful implementation of IMF and World Bank fiscal programs in 1994 subsequently led to a favorable debt rescheduling agreement with creditors at the Paris Club meeting in July 1994.

## **OIL**

Recent studies estimate that Ecuador's reserves-to-production ratio is 17 years and that the country could become a net oil importer early next century. In addition, as new fields are brought on-line in the oil-rich, eastern jungle region called the Oriente, Ecuador's crude reserves are becoming heavier. Maxus Energy, a US company, is currently producing the world's largest quantities of heavy crude in the Tivacuno field and hopes to recover 200 million barrels. Since the crude density at Tivacuno is between 14.5° and 22° API, the oil is first heated and then combined with a lighter crude to enable easier lifting and transportation through the Trans-Ecuadorian pipeline to the coast.

In an effort to best utilize its oil reserves, Ecuador is planning to spend \$4 billion between 1994 and 2005 for exploration and development, expansion of the pipeline network, and upgrades of refineries. Plans include doubling oil production to 650,000 bbl/d by 1997 as well as introducing enhanced oil recovery methods in older fields, such as Shushufindi and Sasha. It is hoped that an additional one billion barrels in new reserves can be added by foreign companies through contract arrangements with Petroecuador before projected production declines significantly.

In June 1994, Petroecuador offered for bid almost 85 percent of the Oriente's crude blocks in the oil-rich Lago Agrio region as well as three blocks located along the Gulf of Guayaquil on the Pacific coast. Sizes of these onshore and offshore blocks range from 494,200 to 988,400 acres. The new contracts are for 25 years, with a possible extension to 31 years, and can be renegotiated under certain circumstances. Rights were awarded to various consortia of international companies including those represented by Amoco-Mobil, Oryx-Santa Fe-Clapson, and the

Triton company.

In May 1993, Occidental started production in the Oriente fields of Laguna, Limoncocha, Indillana, Jivino, and Itava. The company is currently producing 30,000 bbl/d total in this area and expects to maintain this rate for 10 years. Reserves are estimated at 613.1 million barrels. Also last year, Elf started production in the nearby Wanke, Sunka, and Penke fields after seven years of exploration and development. Reserves in these fields average 17° API and are estimated at 24 million barrels.

## **Pipeline construction**

In May 1993, Ecuador began shipping 40,000 bbl/d through the Trans-Andean pipeline to Colombia for export from Tumaco. To increase domestic transportation capabilities, expansion plans are underway for the Trans-Ecuadorian pipeline, which carries crude from Lago Agrio to the Pacific port at Balao. The 502 km (312 mi) pipeline is the world's highest and reaches 4020 meters (13,200 ft) as it carries 325,000 bbl/d across the Andes. Expansion will cost an estimated \$650 million and will consist of a parallel line which would carry 125,000 bbl/d. A recent World Bank report questioned the necessity of the project and concluded that an equivalent capacity could be attained by adding 10 pumping stations to the existing line without requiring a loop.

Pipeline expansion plans also include the construction of a 120,000 bbl/d line which would transport ARCO's heavy crude 180 km (112 mi) from Villano to connect with the Trans-Ecuadorian line at Baeza. Other proposals consist of capacity increases at the Refineria de Esmeraldas and the Refineria Amazonas as well as expansion of the Balao port to receive larger tankers.

## **ENVIRONMENTAL ISSUES**

Environmental concerns are playing an increasingly important role in Ecuador's petroleum operations. In November 1993, a \$1 billion lawsuit was filed against Texaco by a Quechua Indian group which claimed that the oil company had caused irreparable damage to the Oriente rain forest. Texaco produced an average of 220,000 bbl/d during its operations from 1972 to 1992 and accounted for more than two-thirds

of Ecuador's oil production during those years. The World Bank estimates that the hydrocarbon equivalent of 4.4 million barrels of hydrocarbons have been accidentally leaked or spilled as a result of all oil operations in Ecuador.

The Ecuadorian Agriculture Ministry ordered a 15 year freeze on all oil activities in the Oriente's Cuyabeno Wildlife Reserve last fall. In January 1994, however, a commission which included representatives from indigenous Indian groups then agreed to re-open the area for exploration and production, with restrictions. Consequently, foreign companies are now required to perform environmental impact studies before exploration and production and to take the necessary steps to protect the environment.

# Egypt

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## COUNTRY OVERVIEW

**President:** Mohammed Hosni Mubarak

**Prime Minister:** Atef Mohammed Najib Sedky

**Independence:** February 28, 1922 (from the United Kingdom)

**Population (7/94E):** 60.8 million

**Location/Size:** Northern Africa/1,001,450 sq km (386,660 sq mi), about the size of Texas and New Mexico)

**Major Cities:** Cairo (capital); Alexandria; Giza; Port Said

**Languages:** Arabic (official); English; French

**Ethnic Groups:** Eastern Hamitic (Egyptian, Bedouin, Berber) (99%); European and other (1%)

**Religions:** Muslim (primarily Sunni) (94%); Coptic Christian and other (6%)

**Defense:** Army (310,000); Navy (20,000); Air Force (30,000); Air Defense Command (70,000); Reserves (304,000)

## ECONOMIC OVERVIEW

**Currency:** Pound (£E)

**Market Exchange Rate (11/16/94):** £E 3.38= \$1 U.S.

**Gross Domestic Product (GDP) (1993E):** \$139 billion

**Real GDP Growth Rate (1994):** 2.8 percent

**Consumer Price Inflation (1994):** 7.5 percent

**Current Account (1994):** \$2.0 billion

**Merchandise Exports (1994):** \$3.4 billion

**Merchandise Imports (1994):** \$10.4 billion

**Major Export Products:** Crude oil and petroleum products; cotton; textiles; metal products; chemicals

**Major Import Products:** Machinery and equipment; foods; fertilizers; wood products; durable consumer goods; capital goods

**Oil Export Revenues (1994):** \$0.9 billion

**Oil Exports/Merchandise Exports (1994):** 26%

**External Debt (3/93):** \$32 billion

**Total Reserves (non-gold) (9/94):** \$16 billion

## ENERGY OVERVIEW

**Energy Minister:** Dr. Hamdi el-Banbi (Minister of Petroleum); Muhammad Mahir Abazah (Minister of Electricity and Energy)

**Proven Oil Reserves (1/1/94):** 3.4 billion barrels (*World Oil, Arab Petroleum Research Center*); 6.3 billion barrels (*Oil and Gas Journal*)

**Oil Production (1994E):** 920,000 barrels per day (bbl/d); of which 870,000 bbl/d is crude oil

**Oil Production Capacity (1994E):** 930,000 bbl/d

**Oil Consumption (1994E):** 450,000 bbl/d

**Crude Refining Capacity (1/1/95):** 538,000 bbl/d

**Net Oil Exports (1994E):** 470,000 bbl/d

**Natural Gas Reserves (1/1/94):** 20.5 trillion cubic feet (tcf)  
**Natural Gas Production (1994E):** 0.5 tcf  
**Electric Generation Capacity (1994E):** 14,000 megawatts



### **ENVIRONMENT OVERVIEW**

**Total Energy Consumption (1992):** 1.55 quadrillion Btu  
**Energy Consumption per Dollar of GDP (1992):** 51,500 Btu  
(vs. 17,700 Btu in the U.S.)

**Energy Consumption per Capita (1992):** 28.2 million Btu  
(vs. 321.8 million Btu in the U.S.)

**Energy-related Carbon Emissions (1992):** 27.2 million metric tons (0.4% of world emissions)

**Carbon Emissions per Thousand 1985 Dollars of GDP (1992):** 0.9 metric tons (vs. 0.29 metric tons in the U.S.)

**Carbon Emissions per Capita (1992):** 0.5 metric tons per person (vs. 5.3 metric tons in the U.S.)

**Major Environmental Issues:** Rapid population growth and its strain on resources is a major concern. Increased urbanization of Egypt's population has led to degradation of air and water quality in cities. Infrastructure improvements, including new water and sewage facilities, and public transportation projects have been undertaken to combat urban pollution.

### **OIL and GAS INDUSTRIES**

**Organization:** The General Petroleum Authority (GPA) was created in 1956 to oversee Egypt's oil and gas industries, and was renamed the Egyptian General Petroleum Corporation (EGPC) in 1962. The Gulf of Suez Petroleum Company (GUPCO), a joint venture between Amoco (United States) and EGPC, accounts for 45 percent of Egypt's crude production. Other significant crude producers include Belayim Petroleum Company (Petrobel), a joint EGPC Agip (Italy) venture, and the Suez Oil Company (SUCO), a joint venture between EGPC, Repsol (Spain), Deminex (Germany), and Royal Dutch/Shell

(Netherlands).

**Major Oil Fields:** Belayim; El Morgan; Belayim Marine; Gharib

**Major Oil Ports:** Sidi Krir; Ras Shukheir; Ras Gharib

**Oil Export Pipelines (Capacity):** Sumed pipeline (2.4 million bbl/d)

**Major Oil Refineries (capacity):** Mostorod - Cairo Petroleum Refining Company (115,000 bbl/d); Mex - Alexandria Petroleum Company (115,000 bbl/d); Suez - El-Nasr Petroleum Company (100,000 bbl/d)

**Major Foreign Oil Company Involvement:** Amoco (United States); Agip (Italy); Royal Dutch/Shell (Netherlands); Repsol (Spain); British Gas (Great Britain)

**Major Gas Fields:** Abu Madi; Abu Qir/North Abu Qir; Shukheir; Badreddin

### **GENERAL BACKGROUND**

Despite continued low world oil prices and recent decreases in tourism revenues, Egypt's Gross Domestic Product (GDP) grew by 2.8 percent during 1994, and is projected to grow 4.8 percent in 1995. To keep pace with population growth, Egypt's economy needs to grow at least 2.5 percent per year. Egypt's annual rate of inflation has fallen from 27 percent in 1989 to 7.5 percent in 1994.

In October 1993, President Mohammed Hosni Mubarak was elected to his third six-year term in office. Since his election, President Mubarak has increased pressure on Islamic extremist groups that have attacked foreign tourists and security forces. At the same time, the government has increased spending on schools and other public works projects in those provinces where support for the fundamentalists is strongest. Attacks on tourists are estimated to have cost the Egyptian economy upwards of 1 billion dollars in revenue losses to date.

In September 1994, Cairo hosted the United Nations-sponsored International Conference on Population and Development. Nearly 15,000 delegates and journalists from over 150 countries attended.

### **OIL**

Petroleum Minister Hamdi el-Banbi announced that Egyptian oil production will be maintained in 1995 at about 900,000 bbl/d. This decision to extend 1994 production rates into 1995 is in line with OPEC's recent agreement to roll over its own crude oil production quotas through 1995. Although not a member of OPEC, Egypt is a member of the

Organization of Arab Petroleum Exporting Countries (OAPEC), and usually follows OPEC's lead in setting its own oil production levels.

Consumption of oil products has remained stable for several years, and demand for some products has actually declined. Demand for heavy oils, gasoline, and kerosene has decreased yearly. Growth in domestic oil consumption has been restrained by rising prices and the switch to natural gas. Petroleum product prices have been raised by reducing government subsidies but currently are still only 75 to 80 percent of world prices. Egypt has been converting its oil-fired electric power plants to gas, and expects this conversion to be completed by 1997.

### **Pipeline Construction**

In addition to its role as an oil exporter, Egypt has strategic importance because of its operation of the Suez Canal and Sumed (Suez-Mediterranean) Pipeline, both trade routes for Middle East oil. Faced with declines in tonnage and revenues, the Suez Canal Authority (SCA) decided to freeze canal tolls in 1995. Peace initiatives in the Middle East could offer canal customers alternative routes, including the re-opening of a trans-Arabian pipeline that links the Gulf with Israel and Lebanon, and a proposed gas pipeline between Qatar and Israel. The SCA is also continuing enhancement and enlargement projects. By the end of 1996, the Suez canal will be able to accommodate ships with a draft of 59 ft. and 170,000 tons in dead weight. Egypt has spent over 290 million dollars on improving the Suez canal.

The Sumed pipeline is an alternative to the Suez Canal for transporting oil from the Arabian Gulf to the Mediterranean. The 320 km (200 mi) pipeline, which consists of two parallel, 108 cm (42 in) lines, runs from Ain al-Sokhna on the Gulf of Suez to Sidi Krir on the Mediterranean. The Sumed's original capacity was 1.6 million bbl/d, but improvements have increased capacity to 2.4 million bbl/d. The pipeline is owned by the Arab Petroleum Pipeline Company (APP), which is a joint venture between Egypt (50 percent), Saudi Arabia (15 percent), Kuwait (15 percent), the UAE (15 percent), and Qatar (5 percent). The APP has several projects that will expand and enhance the pipeline and its adjacent facilities. Construction is nearly complete on

moorings and storage tanks at Ain al-Sokhna and Sidi Krir. A \$2 billion extension of the pipeline is also being considered. It would traverse the Red Sea from Ain al-Sokhna to Sharm al Sheikh on the Saudi coast, then link-up with the terminal of Saudi Arabia's main east-west pipeline in Yanbu.

### **REFINING**

Construction of Egypt's first privately-owned refinery is scheduled to begin late in 1994. The 100,000 bbl/d refinery, which will include a hydrocracker, is a joint venture between the state-owned Egyptian General Petroleum Corporation (EGPC), two Israeli firms (Metropolitan Investments Company and Merhav Group), and the Swiss firm Galaxy. The refinery will be located in the Ameriya free zone near the oil terminal of Sidi Krir and the terminus point of the Sumed pipeline.

Several of Egypt's seven existing refineries are undergoing expansion. A 36,000 bbl/d hydrocracker is being built at the El-Nasr refinery, located in Suez. Lube oil recycling plants are being installed at the Suez refinery, and the Mex refinery in Alexandria.

Private firms are also becoming involved in oil product distribution in Egypt. United Investment Company, a joint oil distribution company with Libya, plans to build and operate service stations along the coastal highway between the two countries. Shell Marketing Egypt, a division of Royal Dutch Shell has opened service stations in Egypt.

### **NATURAL GAS**

A spate of recent gas discoveries has raised Egypt's natural gas reserves significantly. Egypt's gas reserves at the beginning of 1994 totalled 20.5 trillion cubic feet (Tcf), up from 12.3 Tcf the previous year. The majority of non-associated gas reserves are found in the Nile Delta and the Mediterranean Sea. Associated gas reserves are located primarily in the Gulf of Suez, with smaller quantities found in the Eastern and Western Deserts and the Sinai Peninsula. Several foreign companies are expanding or beginning gas exploration and production activities in Egypt, including British Gas (United Kingdom), Oil & Natural Gas Corporation (India), and Mobil (United States).

A joint venture between Amoco (United States), Agip (Italy), and state-owned Egypt Gas is planning to build a natural gas pipeline to the Israeli border. It is expected to begin operation in 1998 or 1999. The pipeline will eventually supply gas to Israel, the Palestinian self-rule areas, and possibly Lebanon, Jordan, and Turkey.

Work is continuing on the expansion of Egypt's domestic gas distribution network as consumption of gas displaces oil. Currently, the 1,240-mile grid

serves the areas of Alexandria, Cairo, Suez, and Port Said. The government has budgeted over \$200 million over a 5-year period for expansion of the network.

### **ELECTRIC POWER**

Egypt is looking at several ways to meet an ongoing 6 percent annual growth rate in electricity demand. The Egyptian Electricity Authority (EEA) is currently constructing three new power plants that will be located in Kureimat, Sidi Krir and Cairo South. These plants, along with an additional five others planned for construction by EEA, will be powered by coal or natural gas.

The Aswan High Dam, which originally supplied 75 percent of Egypt's electricity, now contributes only 22 percent. There are also two other smaller generating facilities at Aswan. By the end of 1994, the Esna Dam hydroelectric plant with a generating capacity of 90 MW will be on line.

By interconnecting its power grid with those of other countries, Egypt will be able to import/export electricity as needed. Work is nearly complete on a connection between Egypt and Libya, while Egypt and Jordan will be linked in 1995. Egypt also may link its grids with those in Israel, Lebanon, and Turkey.

Egypt currently generates no nuclear power but is planning to construct a 25 MW, \$60 million research reactor with Argentine assistance.

# Gabon

## COUNTRY OVERVIEW

**Head of State:** El-Hadj Omar Bongo

**Population (1994E):** 1.4 million

**Location/Size:** Western Africa/267,670 sq km (103,347 sq mi), slightly smaller than Colorado

**Language:** French (official), Fang, Myene, Bateke, Bapounou/Eschira, Bandjabi

**Religion:** Christian (55-75%), Muslim (less than 1%), remainder animist

**Ethnic Divisions:** About 40 Bantu tribes, including four major tribal groupings (Fang, Eshira, Bapounou, Bateke); about 100,000 expatriate Africans and Europeans, including 27,000 French

**Defense:** Army (1,900); Air Force (600); Navy (500)

**Major Cities:** Libreville (capital), Port-Gentil, Lambarene

## ECONOMIC OVERVIEW

**Gross Domestic Product (1993E):** \$740 million

**Currency:** Communauté Financière Africaine (CFA) franc

**Exchange Rate (1/94):** US \$1 = CFA franc 591.6

**Current Account Balance (1993):** -\$240 million

**Crude Oil Export Revenues (1993):** \$1.45 billion

**Oil Export Revenues/Total Export Revenues:** 79%

**Major Import Products:** Machinery and transport equipment; other manufactures; food

**Major Export Products:** Crude oil, manganese

**Major Trading Partners:** France, United States, Germany

## ENERGY OVERVIEW

**Minister of Mines, Energy, and Hydraulics:** Jean Ping

**Proven Oil Reserves (1/1/94):** 730 million barrels

**Oil Production Capacity (1994E):** 301,000 barrels per day (bbl/d)

**Oil Production (1994E):** 294,000 bbl/d of which 293,000 bbl/d

is crude oil

**OPEC Quota (1Q94):** 287,000 bbl/d (crude only)

**Domestic Oil Consumption (1993E):** 3,000 bbl/d

**Refining Capacity (1/1/94):** 17,300 bbl/d

**Petroleum Exports (1993E):** 290,000 bbl/d

**U.S. Imports (10/93):** 242,000 bbl/d

**Natural Gas Reserves (1/1/94):** 500 billion cubic feet

## OIL INDUSTRY OVERVIEW

**Organization:** Societe Nationale Petroliere Gabonaise

**Major Customers:** France, United States, Germany

**Major Fields:** Obando Marin, Rabi-Kounga, West Oguendjo, Gombe Marine, Hylia, Avocet, Coucal

**Major Ports:** Port-Gentil, Owendo, Libreville

**Major Refinery:** Port-Gentil

## GENERAL BACKGROUND

In mid-January 1994, the Communauté Financière Africaine (CFA) franc was devalued by 50% to 100 CFA francs to 1 French franc. This devaluation affects Gabon, along with 13 other countries in the



CFA currency zone. The devaluation, which was initiated by the International Monetary Fund (IMF), World Bank, and the French government, was designed to increase domestic production and investment over time by generating a boost in exports. The 14 countries never had to worry about the fluctuation of their currency because it had been fixed to the French franc (at 50:1) for 45 years, promoting stability and economic ties.

In December 1993, Gabon held its first free presidential election. President Omar Bongo, who has ruled Gabon for 26 years without a contested election, claimed victory, supposedly receiving 51 percent of the vote. Opposition leaders headed by Bongo's chief rival, Roman Catholic priest Paul Mba Abessole, also declared victory and proceeded to form their own government. Election results are supposed to be validated by Gabon's Constitutional Court sometime early this year.

## OIL

With the addition of some new fields, Gabon's petroleum production capacity has begun its steady rise to forecast levels of 15 percent or more above current levels. Elf has begun producing 6,000 bbl/d of crude from its offshore Hylia field, which should shortly increase to 16,000 bbl/d. Elf-operated fields

in Gabon now produce roughly 115,000 bbl/d. National capacity is scheduled to exceed 330,000 bbl/d in the next few years.

In July 1993, Occidental Petroleum Corporation (Occidental) acquired exploration rights to the 3.3 million acre Meboun Marin block. Under the production sharing agreement, Occidental will conduct a 4,000-kilometer seismic program and drill two wells in the first exploration period. It may also carry out additional seismic work and drilling to evaluate the hydrocarbon potential of the block. The company has a 100 percent exploration interest in the block and is the operator.

# India

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## COUNTRY OVERVIEW

**President:** Shankar Dayal Sharma

**Prime Minister:** P.V. Narasimha Rao

**Independence:** August 15, 1947 (from United Kingdom)

**Population (7/94E):** 920 million

**Location/Size:** Southern Asia/3,287,590 sq km (2.04 million sq mi), slightly more than one-third the size of the U.S.

**Major Cities:** New Delhi, Bombay, Calcutta, Madras, Hyderabad, Bangalore, Ahmedabad, Lucknow, Jaipur

**Languages:** English, Hindi, Urdu, Telegu, Marathi, Tamil, Gujarati, Malayalam, Kannada, Oriya, Punjabi, Assamese, Kashmiri, Sindhi, Sanskrit, Hindustani, Bengali, others

**Ethnic Groups:** Indo-Aryan (72%), Dravidian (25%), Mongoloid, and other (3%)

**Religions:** Hindu (80%), Muslim (14%), Christian (2.4%), Sikh (2%), Buddhist (0.7%), Jains (0.5%), other (0.4%)

**Defense (6/93):** Army (1,100,000), Air Force (110,000), Navy (55,000)

## ECONOMIC OVERVIEW

**Currency:** Rupee

**Official Exchange Rate (12/94):** \$1 = 31.37 rupees

**Gross Domestic Product (GDP) (1994E):** \$1.17 trillion

**Real GDP Growth Rate (1994E):** 3.8%

**Inflation Rate (1994E):** 9.1%

**Current Account Balance (1994E):** -\$0.66 billion

**Merchandise Exports (1994E):** \$24.3 billion

**Merchandise Imports (1994E):** \$24.2 billion

**Major Export Products:** Gems and jewelry, engineering goods, clothing, cotton textiles, iron ore, leather, chemicals

**Major Import Products:** Petroleum and related products, machinery, iron and steel, chemicals, edible oils, fertilizers

**Major Trading Partners:** Russia, United States, Japan, United Kingdom, Germany, Italy, Belgium

**Monetary Reserves (1/94, non-gold):** \$18.8 billion

**Total External Debt (1994E):** \$85.2 billion

## ENERGY OVERVIEW

**Minister of Oil and Gas:** Satish Sharma

**Proven Oil Reserves (1/1/94):** 5.9 billion barrels

**Oil Production (1994E):** 585,000 barrels per day (bbl/d) of which 570,000 bbl/d is crude oil

**Oil Production Capacity (1994E):** 590,000 bbl/d

**Oil Consumption (1994E):** 1.4 million bbl/d

**Crude Refining Capacity (1/1/95):** 1.1 million bbl/d

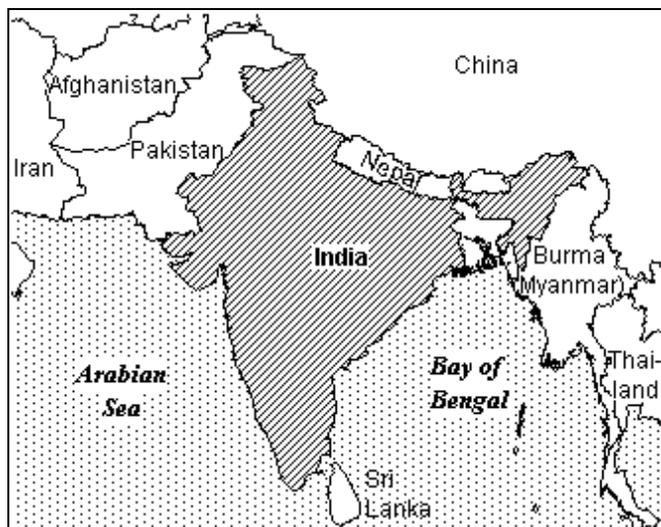
**Net Oil Imports (1994E):** 810,000 bbl/d

**Major Oil Suppliers:** Saudi Arabia, Kuwait, Iran, Abu Dhabi, and Malaysia

**Natural Gas Reserves (1/1/94):** 25.4 trillion cubic feet (tcf)

**Natural Gas Production (1994E):** 498 billion cubic feet (Bcf)

**Natural Gas Consumption (1994E):** 498 Bcf



**Coal Production (1994E):** 303 million short tons (mmst)  
**Coal Consumption (1994E):** 310 mmst  
**Electricity Generation Capacity (1994E):** 82 gigawatts  
**Electricity Production (1994E):** 310 TWh

**ENVIRONMENT OVERVIEW**

**Total Energy Consumption (1992):** 8.51 quadrillion Btu  
**Energy Consumption per Dollar of GDP (1992):** 5,400 Btu (vs. 17,700 Btu in U.S.)  
**Energy Consumption per Capita (1992):** 9.9 million Btu (vs. 321.8 million Btu in U.S.)  
**Energy-related Carbon Emissions (1992):** 177.4 million metric tons (2.9 percent of world total)  
**Carbon Emissions per Thousand Dollars of GDP (1992):** 0.11 metric tons (vs. 0.29 metric tons in U.S.)  
**Carbon Emissions per Capita (1992):** 0.13 metric tons (vs. 5.3 metric tons in U.S.)  
**Major Environmental Issues:** Air and water pollution, soil degradation, water shortages, greenhouse gas emissions

**ENERGY INDUSTRY**

**Organizations:** Oil and Natural Gas Corporation - ONGC (exploration and production), Oil India Ltd - OIL (exploration and production), Indian Oil Corporation - IOC (refining and marketing)  
**Major Producing Oil Basins:** Bombay High, Upper Assam, Cambay, Krishna-Godavari, Cauvery  
**Major Ports:** Bombay, Calcutta, Cochin, Kandla, Madras  
**Major Oil Refineries (1/1/95, capacity-bbl/d):** Koyali-Gujarat (185,100), Mathura-Uttar Pradesh (156,000), Mahul-Bombay (134,860), Madras (130,660), Mahul-Bombay (110,452), Ambalamugal (93,400), Visakhapatnam (90,369), Barauni-Bihar (65,800), Haldia-West Bengal (61,000), Bongaigaon-Assam (27,110), Guwahati-Assam (19,920), Digboi-Assam (11,700)  
**Major Oil Pipelines:** Haldia-Barauni, Kanla-Bhatinda,

Hazira-Jagdishpur  
**Major Foreign Oil Company Involvement:** Exxon, Shell, Mobil, Enron, Conoco, Caltex, Pennzoil, Elf, Bechtel  
**Major Gas Fields:** Olpad, South Bassein, BS-13, BS-12  
**Major Gas Pipelines:** Bombay-New Delhi

**GENERAL BACKGROUND**

In late 1994, Indian Prime Minister P.V. Narasimha Rao's incumbent Congress (I) Party faced important political challenges. In December 1994, four cabinet ministers tendered their resignations after allegations of financial mismanagement and corruption. Also in the same month, the Congress (I) Party lost legislative elections in three key southern states, including Andhra Pradesh. The next state elections are scheduled for February 1995.

During 1994, Prime Minister Rao's 1991 reform package continued to have an impact on India's economic growth. The gross domestic product (GDP) growth rate, which was roughly 4 percent in 1992 and 1993, is estimated at 5 percent in 1994. Official Indian forecasts anticipate GDP growth averaging between 6-7 percent for the rest of the decade. Inflation accelerated during the first half of 1994, partly due to an increase in public sector borrowing. During the last half of 1994, however, public sector borrowing needs declined as the government augmented its tax base through increases in excise tax collections and customs duties. This was made possible through a greater voluntary compliance with India's new, lower corporate tax rates. A new 5 percent ad valorem tax on oil and gas products was imposed. Reduced government borrowing helped to contain the year's annual inflation rate at an estimated 9.1 percent. This was up from the 1993 rate of 7.7 percent. Fiscally, defense spending and government subsidies were reduced in 1994, while policies promoting the financial self-reliance of state governments were implemented as well. Combined, these economic reforms helped to reduce the budget deficit from 9 percent of GDP in 1990 to below 6 percent in 1994.

To help encourage foreign investment, India eliminated industrial licensing, privatized state-

owned companies, and reduced tariffs and trade restrictions. In addition, the rupee was devalued and made convertible in 1993. During April to September 1994 (the first 5 months of India's fiscal year), foreign investment outside of the energy sector was an estimated \$2.1 billion, as compared to \$4.1 billion for 1993. According to the U.S. Department of Energy, energy-related investments by U.S. companies during all of 1994 totalled \$4 billion. Since reforms began, the oil and gas sectors typically have attracted 40 percent of all foreign capital invested in India. In 1994, the World Bank and the International Bank for Reconstruction and Development (IBRD) agreed to co-finance loans to develop India's energy sector. While the World Bank recently deferred payment of a \$350 million loan until Indian oil industry reforms are completed, the Bank is considering a \$4-5 billion loan aimed at rehabilitating India's highway system.

## **OIL**

Oil consumption accounts for about one-third of India's total energy requirements. The majority of India's 5.9 billion barrels of oil reserves are located in the Bombay High, Upper Assam, Cambay, Krishna-Godavari, and Cauvery basins. Domestic oil production fell from a high of 680,000 barrels per day (bbl/d) in 1989 to 543,000 bbl/d in 1993. Reasons for the decline in output include a lack of investment in exploration and development, poor reservoir management by the state-owned Oil and National Gas Corporation (ONGC), and reliance on old Soviet-era equipment. Oil fields in Bombay High account for the bulk of India's production. However, output from the basin has fallen recently, from 440,000 bbl/d in 1990 to 320,000 bbl/d in 1993. India imported roughly 58 percent of its 1.4 million bbl/d domestic oil requirements in 1994. Oil imports came primarily from Saudi Arabia, Kuwait, Iran, Abu Dhabi, and Malaysia.

In an effort to increase domestic oil production and limit oil imports, India embarked upon an Accelerated Exploration Program (AEP) in 1993. The AEP proposed investing \$23 billion in the oil sector between 1994 and 1996, and called for

exploration of oil shales, deepwater drilling in fields up to 3,900 feet deep, development of coalbed methane, horizontal drilling, and implementation of enhanced oil recovery (EOR) projects. In 1994, Chevron, Amoco, and Occidental bid on EOR projects in Bombay High.

In December 1994, the Indian government concluded its eighth licensing round for new exploration and development. This round was preceded in 1994 by a round which included small and medium oil fields which ONGC could not afford to develop. These types of fields and others were offered under a new, more attractive profit-sharing arrangement. In early 1994, Enron Corporation entered a profit-sharing agreement with India's Reliance Petroleum. Under the contract, Enron will develop the Panna and Mukta oil and gas fields as well as the Tapti gas field. Unproven natural gas reserves in the three fields are estimated at 2 trillion cubic feet.

By implementing the AEP, privatizing selected state-owned oil companies, and bringing production online from new offshore oil fields, the Indian government projects a 21 percent increase in oil production between 1994 and 1995. By 1998, the government optimistically hopes to increase the country's oil production to 890,000 bbl/d. Domestic oil demand is expected to reach 2 million bbl/d by 2000. Consequently, India's oil imports are expected to remain relatively constant at around 55-60 percent.

## **Privatization**

The Indian oil industry is undergoing gradual privatization. ONGC remains India's largest upstream oil company, with production of 500,000 bbl/d of oil and 1.6 million cubic feet of natural gas in 1993. In September 1994, the government offered an initial 2 percent of ONGC's shares to the public. By January 1995, it plans to have sold-off 20 percent of ONGC's assets, with the shares divided evenly between domestic and foreign investors. The government hopes that ONGC's sale will add \$645 million in investment to India's oil industry. Additionally, ONGC has extensive

foreign holdings which could benefit from privatization, including upstream operations in Egypt, Iraq, Tanzania, Vietnam, Thailand, Abu Dhabi, and Iran.

In 1993, India's other state-owned upstream company, Oil India Limited (OIL), accounted for 56,000 bbl/d of India's oil production. In June 1994, the government announced that 10 percent of OIL would be privatized. As limited corporations, ONGC and OIL are planning to invest \$2.2 billion before 1997 in domestic exploration and production. The corporations also are hoping to obtain another \$2 billion by offering foreign investors large equity shares in new ventures. At present, OIL is actively exploring oil fields offshore of Saurashtra and north of Brahmaputra in Assam.

India's downstream sector is undergoing similar privatization. Indian Oil Corporation (IOC) is the country's largest refining and marketing company, controlling a 55 percent share of India's refined product market. In late 1994, an initial 5 percent of IOC was offered to the public as the first step in plans to sell up to 49 percent of IOC. The IOC sale parallels the partial privatization of six other Indian refiners since 1991. These include Cochin Refineries (45%), Indo-Burma Petroleum (40.3%), Madras Refineries (33%), Hindustan Petroleum (30%), Bharat Petroleum (30%), and Bongaigon Refinery and Petrochemicals (25.6%). In late December 1994, Hindustan Petroleum announced its intention to sell an additional 19 percent of its shares. This will leave the state with a 51 percent majority ownership, while generating an expected \$50 million in revenue.

In September 1994, IOC announced that it will create a joint venture (JV) company with Hindustan Petroleum and Bharat Petroleum. The JV will be involved in exploration and production and will be an autonomous, non-government-owned corporation.

### **REFINING**

In order to meet its projected annual 6 percent increase in domestic oil demand, India has

embarked on an aggressive refinery expansion program. As of December 1994, the government had approved over a dozen new refinery construction projects. These include Reliance Petroleum's 180,000 bbl/d refinery in Gujarat, IOC's 120,000 bbl/d refinery at Karnal near New Delhi, and IOC's 120,000 bbl/d Panipat refinery in Uttar Pradesh. Foreign JV refineries currently under construction include IOC/Kuwait Petroleum's \$1.2 billion refinery at Baradip in Orissa and Bharat/Oman Oil Corporation's 120,000 bbl/d refinery at Bina in Madhya Pradesh. Since the majority of these new refineries have completion dates in the late 1990s, many analysts are skeptical that India will be able to meet its refined product demand by 2000. New construction is being hindered by a shortage of foreign investment and capital. Private refiners have argued that the government's deregulation of product prices has made it difficult to compete against state-owned refiners when building new refineries.

In 1993, the Indian government deregulated imports of kerosene, liquefied petroleum gas (LPG), and low sulphur waxy residue (LSWR). These products are used extensively in the agricultural sector, which consumes about 230,000 bbl/d of kerosene. While the government continues to subsidize the prices of these products, it has created a "parallel marketing" system. Under parallel marketing, only IOC and other state-owned refiners are allowed to sell kerosene and LPG at subsidized prices. IOC also owns most of the country's distribution infrastructure. Bharat and Hindustan Petroleum control large regional networks in addition. Unsubsidized sales by non-state-owned firms, such as Reliance Petroleum, are restricted not only by higher retail prices, but by state control over pipelines and storage facilities. The government intends to remove the parallel marketing system eventually as the downstream sector is deregulated.

### **Joint Ventures**

Exxon recently returned to India for the first time since its assets were nationalized 18 years ago. In 1994, the company formed a joint venture with Hindustan Petroleum, which now owns Exxon's

former refinery and lubricants plant. The JV will provide Exxon licensing for Hindustan Petroleum to market Esso products obtained from Esso Singapore. Similar lubricant marketing ventures by Shell and Mobil were announced in 1994. The U.S. companies will form partnerships with Bharat and IOC, respectively. All three U.S. majors reportedly are examining larger downstream ventures. Other U.S. oil companies which have entered India's \$10.5 billion petroleum products market are Pennzoil, Caltex, Elf Aquitaine, and Royal Dutch/Shell. As of mid-1994, Shell was selling its lubricants through 300 gas stations owned by its Indian partner, Bharat. Shell is building a blending plant near Bombay with hopes eventually to market its products through all of Bharat's 4,000 gas stations. In June 1994, Shell sold its 27,500 bbl/d Turbo Balzac refinery located in Calgary to a Madras-based company. In other downstream developments, Conoco was considering a refinery project in mid-1994 through which it could supply the Indian subcontinent.

### **NATURAL GAS**

Natural gas supplies about 8 percent of India's energy demand. Domestic gas consumption is expected to increase 15-18 percent per year through 2000 and to reach 4-6 billion cubic feet (Bcf) per day by 2005. Almost 70 percent of India's natural gas reserves are found in Bombay High and Gujarat. Because of a lack of distribution infrastructure, over 20 percent of India's offshore gas production is flared. The government hopes to reduce this level to 2 percent through new gas pipeline development. Projects under construction include a line from South Bassein to Hazira, a \$710 million line from Bijaipur in Madhya Pradesh to Dadri in Uttar Pradesh, and a \$150 million British Gas pipeline to service Bombay.

In September 1994, India signed an agreement with Oman to build a 970 meter (600 mi) underwater pipeline to carry Omani gas under the Arabian Sea to Gujarat. The pipeline will cost an estimated \$5 billion and will support a potential \$50 billion worth of natural gas sales over the project's lifetime. The first phase will supply 1 Bcf per day

by 1999. A second 1 Bcf pipeline will be built subsequently by 2001. In 1994, a feasibility study was completed by a consortium of companies comprised of McDermott, Bechtel, ETPM, and Saipem and Snamprogetti. Construction of the 3,400 meter (11,000 ft) deep pipeline is set to begin in mid-1995. In March 1994, Oman Oil Company and India's National Thermal Power Company (NTPC) agreed to build a 5,000-megawatt (MW) power station fueled by gas from the proposed Omani pipeline to supply western and southern India with electricity. Additionally, Omani gas could supply northern power stations at Kawas, Anta, and Auriaya. Total cost of both projects could reach \$5 billion. As of mid-1994, a 1,930 meter (1,200 mile), 1.7-Bcf gas pipeline from Iran is under evaluation by the Indian government. Of the five proposed routes for the Iranian line, four run through Pakistani territorial waters and one runs overland through Pakistan. Initial bids for the construction contract were scheduled to take place in late 1994.

### **COAL**

Coal satisfies about 60 percent of India's energy demands. India is the world's fifth largest coal producer and ranks third in the production of hard coal behind the United States and China. Roughly two-thirds of India's 530 operating mines are underground. In 1993 opencast mines accounted for 74 percent of India's total coal production despite employing only 16 percent of the mining workforce. Also, most of the coal industry's growth over the past 20 years has been in surface mining. Indian reserves include lignite and bituminous coal, but not anthracite. The country's primary coal fields are located in Bihar, West Bengal, and Madhya Pradesh. Total coal reserves are estimated at 69 billion short tons, or 6 percent of the world's total.

India's coal has a low sulfur and high ash content. India recently has begun to add steam coal and thermal coal wash plants to supplement its 21 operating coking coal wash plants. As of late 1994, two new thermal coal washing plants were under construction and three more were anticipated.

Total additional capacity of all 5 plants is projected at 27 million short tons per year.

In 1993, state-owned Coal India Limited (CIL) accounted for 90 percent of the country's coal production. Over 60 percent of India's coal is transported by state-owned India Railways. The NTPC, which has its own dedicated railway system, transports a large percentage of the remainder. As a result of both environmental constraints and land availability, surface mining is unlikely to support the growth in domestic coal demand after 2010. Consequently, the Indian government has begun to take steps to deregulate the nation's coal industry and to allow an increase in coal imports. In early 1995, the government cut the 85 percent steamcoal import tariff down to 15 percent. At the same time, CIL is planning to export Indian coal beyond its traditional markets in Nepal and Bangladesh, to new markets in Japan, Korea, and China, where high ash Indian coal could be blended with higher grade coal from other sources. Export earnings should help to offset any losses to domestic producers because of the cut in import tariffs. At present CIL is evaluating the export potential of both the large Raniganj coalfield and the Orissa fields.

In January 1994, India signed an agreement with China in which India's current room-and-pillar underground mines would be replaced with Chinese long-wall technology. India is hopeful that this will enable the extraction of higher grades of coal from underground mines. As of late 1994, India also was negotiating a \$500 million loan from the World Bank for use in developing new coal mines.

### **ELECTRICITY**

Electricity supplies 14 percent of India's energy needs. However, it meets 87 percent and 45 percent of the country's agricultural and commercial sectors' energy requirements, respectively. As of 1990, about 80 percent of the country was electrified. Official estimates state that the country will need 142,000 MW of new capacity by 2005. The government's 1992 five-year development plan called for adding 48,000 MW of

electrical generating capacity to its then existing capacity of 75,000 MW. In 1994, this goal was lowered to 30,000 MW. About 3,000 MW of this capacity will come from independent power projects (IPPs) and the rest from NTPC projects.

In 1992, the government amended India's Electricity Act of 1910 and opened the sector to privatization and foreign investment. In 1993, an incentive package provided a five-year tax holiday for new projects in the power sector and, under World Bank advisement, a guaranteed 16 percent return on foreign investments. Additionally, the project approval system, which required up to 17 separate approvals in certain cases, was revised substantially. With these changes, IPPs are expected to add most of India's electrical capacity after the year 2000. In mid-1994, the Indian government ended its practice of subsidizing electricity sales. India's five regional power boards have cost the government over \$1.6 billion in recent years.

The largest IPP currently under development is Hopewell Holding's 10,560 MW coal-fired power plant. In September 1994, Hopewell Holding, a subsidiary of Hong Kong's Consolidated Electric Power Asia, signed a memorandum of understanding with the Power Grid Corporation of India. This was unique in that Power Grid is a federal utility rather than a state electricity board. The first units are projected to come online in 1999, with all 16 x 660-MW units completed by 2003. The project is expected to cost \$12.7 billion. As of late 1994, the power plant's location was not yet decided and will be determined by the availability of coal sources.

Another large IPP is the \$2.5 billion, 2,015-MW Dabhol LNG-fired combined cycle power plant. In late November 1994, the Indian government gave its final approval to begin construction in Maharashtra, 100 miles south of Bombay. The plant will be constructed by a consortium of Enron, Bechtel, and General Electric.

Cogentrix Energy, a General Electric subsidiary,

recently signed an agreement to build a \$1.3 million, 1,000-MW coal-fired plant in Mangalore, Karnataka. Construction will begin in 1995 and will take 3 years. In another project, HI Energy, a Houston Lighting & Power subsidiary, will build a 500-MW coal-fired plant in Madhya Pradesh. The plant will be powered by the Bursinghpur coal mine after construction is completed in 1999.

### **Nuclear**

As of 1993, nuclear power accounted for 2.5 percent of India's electric generating capacity. India has nine operational nuclear reactors and another eight under development. Of the operational reactors, seven are of the pressurized heavy-water-moderated and-cooled type. The other two are boiling light-water-cooled and-moderated types manufactured by General Electric in the late 1960s. At the beginning of 1994, total net nuclear generating capacity was 1,593 MW, although actual utilization rates are reported to be around 40 percent. The additional planned reactors will add a projected 1,100 MW of capacity, and Indian officials estimate that the country has enough uranium supplies to support a nuclear power program of 8,000 MW. The largest project under construction is Nuclear Power Corporation's 500-MW reactor in Rajasthan. However, financing has proven a major obstacle in new construction.

### **Renewable Energy**

The Indian government is actively promoting the application of non-conventional sources of energy to supply the country's energy needs. A targeted increase from 600 MW to 2000 MW has been set during the current five-year plan. This increase includes wind, hydro, biomass, and solar photovoltaic technologies. In December 1994,

India signed 25 agreements with U.S. companies to develop non-conventional technology. Included in the deals was an agreement for the U.S. Electric Power Research Institute to develop a 15-year plan to implement large-scale solar power projects in India. Also, India is actively pursuing wind technology. Private sector wind farm development is expected to add an additional 325 MW in the next few years to India's 1993 wind power generating capacity of 53 MW. To augment this capacity further, in December 1994, India ordered 600 wind turbines from Kennetech.

# Indonesia

## COUNTRY OVERVIEW

**President:** General Haji Mohamed Suharto

**Vice-President:** General Try Sutrisno

**Independence:** August 17, 1945 (legally December 27, 1949 from the Netherlands)

**Population (7/94E):** 200.5 million

**Location/Size:** Southeastern Asia/1,919,440 sq km (741,097 sq mi), slightly less than three times the size of Texas

**Major Cities:** Jakarta, Surabaya, Bandung, Medan, Semarang, Palembang, Ujung Pandang, Surakarta, Jogjakarta

**Languages:** Bahasa Indonesia, Dutch, English, Javanese

**Ethnic Groups:** Javanese (45%), Sundanese (14%), Madurese (7.5%), coastal Malays (7.5%), other (26%)

**Religions:** Muslim (87%), Protestant (6%), Roman Catholic (3%), Hindu (2%), Buddhist (1%), other (1%)

**Defense (6/93):** Army (203,000), Air Force (24,000), Navy (44,000), Paramilitary forces (215,000)

## ECONOMIC OVERVIEW

**Currency:** Rupiah

**Official Exchange Rate (12/94):** \$1 = 2,180 rupiah

**Gross Domestic Product (GDP)(1993E):** \$571 billion

**Real GDP Growth Rate (1993E):** 6.5%

**Inflation Rate (1994E):** 8%

**Current Account Balance (1994E):** -\$2.8 billion

**Merchandise Exports (1994E):** \$40.8 billion

**Merchandise Imports (1994E):** \$31.5 billion

**Major Export Products:** Petroleum, liquefied natural gas, clothing, fabrics, plywood, footwear

**Major Import Products:** machinery, semi-finished goods, chemicals, raw materials, transport equipment, foodstuffs

**Major Trading Partners:** Japan, United States, Australia, South Korea, Singapore, Germany

**Oil Export Revenues (1994E):** \$5.6 billion

**Oil Export Revenues/Total Export Revenues (1994E):** 14%

**Monetary Reserves (1/94, non-gold):** \$ 11.4 billion

**Total External Debt (1994E):** \$100 billion

## ENERGY OVERVIEW

**Minister of Mining and Energy:** Ida Bagus Sudjana

**Proven Oil Reserves (1/1/94):** 5.8 billion barrels

**Oil Production (1994E):** 1.53 million barrels per day (bbl/d) of which 1.33 million bbl/d is crude oil

**Oil Production Capacity (1994E):** 1.65 million bbl/d

**OPEC Production Quota (1994):** 1.33 million bbl/d

**Oil Consumption (1994E):** 770,000 bbl/d

**Crude Refining Capacity (1/1/94):** 985,200 bbl/d

**Net Oil Exports (1994E):** 750,000 bbl/d

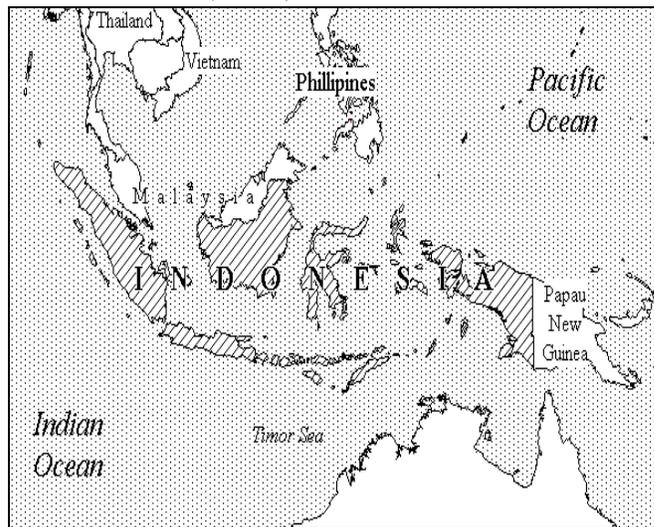
**Major Oil Customers:** Australia, Japan, United States

**Natural Gas Reserves (1/1/94):** 64.4 trillion cubic feet (tcf)

**Natural Gas Production (1993):** 1.84 tcf

**Natural Gas Consumption (1993):** 0.713 tcf

**Coal Production (1994E):** 35.2 million short tons



**Coal Consumption (1994E):** 16.0 million short tons

**Electric Generation Capacity (1994E):** 11.6 gigawatts

**Electricity Production (1994E):** 38 terawatt-hours

## ENVIRONMENT OVERVIEW

**Total Energy Consumption (1992):** 2.57 quadrillion Btu

**Energy Consumption per Dollar of GDP (1992):** 19,200 Btu (vs. 17,700 Btu in U.S.)

**Energy Consumption per Capita (1992):** 13.9 million Btu (vs. 321.8 million Btu in U.S.)

**Energy-related Carbon Emissions (1992):** 46.9 million metric tons (0.8 percent of world total)

**Carbon Emissions per Thousand Dollars of GDP (1992):** 0.35 metric tons (vs. 0.29 metric tons in U.S.)

**Carbon Emissions per Capita (1992):** 0.25 metric tons (vs. 5.3 metric tons in U.S.)

**Major Environmental Issues:** Rainforest degradation

## OIL and GAS INDUSTRIES

**Organization:** Pertamina - state-owned oil and gas company; PLN - state-owned electric company; MLNG - liquefied natural gas company; Perum Gas Negara (PGN) - gas distributor and transmission company; PT Tambang Batubara Bukit Asam (PTTBBA) - state coal company

**Major Producing Oil Fields:** Duri, Minas, Widuri, Belida

**Major Ports:** Cilacap, Cirebon, Jakarta, Kupang, Palembang, Ujungpandang, Semarang, Surabaya

**Major Oil Refineries (1/1/94, capacity-bbl/d):** Pertamina-Balikpapan, Kalimantan (257,500); Cilacap, Central Java (302,400); Dumai, Central Sumatra (122,500); Musi, South Sumatra (126,900); Pangakalan Brandan, North Sumatra

(4,800); Sungai Pakning, Central Sumatra (46,100); EXOR-1, Balongan, Java (125,000)

**Major Foreign Oil Company Involvement:** Total, Conoco, Mobil, Chevron, ARCO, Unocal

**Major Gas Fields:** Arun, Badak, Niolam, Natuna, Peciko, Bontang, Bali

**Major Gas Pipelines:** Kangean-Gersik, Trans-Java

## **GENERAL BACKGROUND**

Indonesia's financial deregulation, which began in 1988, has resulted in a gradual diversification from the country's economic reliance on petroleum and natural gas exports. Whereas those exports accounted for 24 percent of gross national product (GNP) in 1981, they made up 10.8 percent of GNP in 1993. Tight monetary controls which were imposed in mid-1990 set a limit on foreign borrowing and led to the postponement of many large infrastructure and energy-related projects. In 1994, the Indonesian economy recorded an estimated growth in gross domestic product (GDP) of 7.2 percent. This follows average annual GDP growth rates of six percent from 1985 to 1993. Inflation in 1994 is expected to average eight percent, exceeding government targets. The higher inflation rate is attributable partly to a drought which damaged 500,000 acres of rice crops and resulted in a subsequent 12 to 15 percent increase in rice prices.

Private foreign investment in Indonesia fell 21 percent in 1993, to \$8.1 billion from \$10.3 billion in 1992. In June 1994, the Indonesian government implemented a deregulation package which opened up nine new sectors of the economy for private investment. These sectors included electricity production and distribution, nuclear energy, shipping, and telecommunications. Subsequently, foreign investment increased by \$9 billion in July 1994. As of late 1994, over \$20 billion in new investment had taken place during the year. Total U.S. investment in Indonesia as of mid-1994 was over \$30 billion. Indonesia additionally received \$5 billion in World Bank aid in both 1993 and 1994. Most of these grants and loans are targeted for energy, agriculture, and infrastructure projects.

## **OIL**

Roughly 80 percent of Indonesia's 5.8 billion barrels of proven oil reserves are located onshore in highly

complex tertiary structures. Most field development and production has taken place in accessible areas, such as Sumatra, Kalimantan, and Java. Of these locations, Sumatra holds 70 percent of Indonesia's proved or probable reserves. Analysts predict that Indonesia could become a net oil importer sometime between 2005 and 2015. Exactly when this will occur depends on the development rate of new oil discoveries. Another factor will be Indonesia's ability to diversify its current domestic oil demand to other energy sources. During 1994, oil demand increased by seven percent, reaching an estimated 770,000 barrels per day (bbl/d). Current Indonesian oil reserves should last 10 years, as compared to 40 years for natural gas reserves. Consequently, the Indonesian government is taking active steps to increase the domestic use of natural gas. Pertamina, the state-owned oil and gas company, projects oil production levels will drop from 1.53 million bbl/d in 1994 to 1.50 million bbl/d by 1999. One Pertamina official recently stated that under optimal conditions, oil production of at least one million bbl/d could be maintained until 2020.

Indonesia relies heavily on foreign oil companies for exploration, development, and production of its hydrocarbon resources. During 1993, PT Caltex Pacific Indonesia (CPI), an affiliate owned jointly by Chevron and Texaco, accounted for 43 percent of Indonesia's total oil production. In late 1992, CPI negotiated a 25-year contract extension for its operations in the Rokan Block in Central Sumatra. The Rokan Block is the location of the large Duri and Minas fields. Since it is heavy and waxy, Duri crude oil is difficult to lift with just the use of primary recovery techniques. Therefore, CPI has employed enhanced oil recovery (EOR) methods such as steamflooding on the field since 1985. The application of EOR has resulted in a projected increase in recoverable reserves of three billion barrels. Also, a \$520-million, 335-mile pipeline should be completed by mid-1996 to transport natural gas from the Asamera field in South Sumatra to the Duri field. Once operational, Asamera gas will replace Duri crude oil, which presently is burned on-site for use in steam injection. This will free up a projected 60,000 bbl/d of additional oil for export. Production at the Duri field averaged 247,000 bbl/d in 1993. At CPI's Minas field, peripheral water

injection was converted recently to a patterned waterflood to improve oil recovery.

Of the other large foreign producers in Indonesia in 1993, Maxus Energy accounted for 10 percent of the country's oil output, ARCO for 8 percent, and Mobil for 7 percent. Also of note, CPI, Maxus, ARCO, and Mobil all experienced production declines due to natural reservoir depletion in 1994. However, Conoco's offshore Belida field in the Natuna Sea, which came onstream in late 1992, increased its production to 130,000 bbl/d in mid-October 1994.

In 1994, Pertamina and foreign oil companies invested an estimated \$4 billion in exploration and production in Indonesia. Pertamina offers a variety of contract options to foreign oil companies. Indonesia was the first country to use production sharing contracts (PSCs). Under a PSC, Pertamina oversees operations and takes a share of the production profits.

As of mid-1994, there were 105 PSCs in effect in Indonesia of which 83 were operated by foreign companies. Pertamina expects that 11 new PSCs will have been signed in 1994, down from the 12 signed in 1993. An anticipated 15 PSCs will be signed in 1995. Other types of contracts in use are joint operation agreements, technical assistance contracts, and the enhanced oil recovery contracts (EORCs). The EORCs are in wide use because of the mature nature of the oil fields in western Indonesia.

Pertamina is encouraging exploration and development of pre-tertiary structures in eastern Indonesia. Specifically targeted areas are in Sulawesi and the Salawati area of Irian Jaya. As an inducement, Pertamina introduced its fourth incentive package in January 1994. This package provides an improved equity split between Pertamina and the holders of PSCs in frontier and deepwater acreage. Additionally, government royalties from oil and gas production in those areas were reduced from 20 percent to 15 percent. In 1994, 31 frontier areas were offered either through standard PSCs or through direct negotiations.

Japan is the largest consumer of Indonesian petroleum and gas products. Since most Indonesian crudes have high pourpoints, a larger amount of heavy distillates,

such as fuel oil and low-sulfur waxy residue (LSWR), is produced. Japanese utility companies buy Indonesian LSWR for direct burning, but demand has slackened appreciably over the last year.

### REFINING

Indonesia has seven refineries, with a total capacity of 985,000 bbl/d. In November 1994, EXOR-1 began operations. It has a capacity of 125,000 bbl/d. EXOR-1 is connected to Jakarta with a new 90,000 bbl/d pipeline. It is anticipated that the plant will satisfy 60 percent of the city's demand for middle distillates during 1995.

In 1994, Pertamina began a \$1.04 billion refinery upgrade project. This was partially-financed by the U.S. Export-Import Bank, which provided a \$600 million loan to operationalize the two refineries at Cilacap in Central Java. After the project, Cilacap's capacity is expected to increase from its present 302,000 bbl/d to about 400,000 bbl/d. Also, Pertamina is upgrading its two Balikpapan refineries on Kalimantan. After completion, total projected capacity of the two refineries will increase from 258,000 bbl/d to 350,000 bbl/d. Balikpapan's refineries will be able to process light crude oil. In 1993, Indonesia imported 150,000 bbl/d of light crude oil from the Middle East (74%), Malaysia (13%), and Australia (13%). New refineries also will be built to meet the burgeoning domestic oil demand. The first two will be built in Sumatra by Indonesian companies with private financing. They will have capacities of 120,000 bbl/d and 100,000 bbl/d. Finally, Pertamina will build a third, \$75 million refinery with a capacity of 10,000 bbl/d in Sorong, Irian Jaya.

### NATURAL GAS

Indonesia is the world's largest exporter of liquefied natural gas (LNG), with a capacity of 26.9 million short tons per year (mmst/yr). The country is also the world's seventh largest producer of natural gas. In order to expand its natural gas industry, Indonesia is taking three steps. The first step is LNG contract extensions. In October 1994, Pertamina extended two key long-term LNG supply contracts with Japan, which will continue to supply Japan with more than 12 Mt/yr through 2009. Likewise, Pertamina would like to extend its LNG contracts with Korea and China which expire in 2005 and 2010, respectively.

Second, Indonesia is aiming to increase LNG exports of its uncommitted gas reserves to the Pacific Rim. Pertamina President Faisal Abda'Oe has stated that meeting Asia's anticipated demand will require development of Indonesia's frontier areas as well as the construction of new LNG plants. Pertamina estimates a cost of \$1 billion to develop 1.1 Mt/yr of LNG production. Finally, Indonesia is expanding its domestic gas business. Pertamina expects to realize a four-fold increase in domestic natural gas consumption between 1994 and 2000. In 1994, gas consumption increased after the 1993 removal of government subsidies on petroleum products. This resulted in a 20 percent increase in oil prices and a concomitant decrease in domestic oil consumption. Furthermore, Indonesia is constructing a pipeline grid which will connect gas fields to end-users in at least three of Indonesia's five main islands. Pipeline projects either completed or near completion are the 270-mile Trans-Java line and the first phase of the Sumatran gas grid.

One of Indonesia's large producing natural gas areas is in eastern Kalimantan at the Nilam, Badak, and adjoining fields. These fields are operated by Total, ARCO, and VICO. Another important area is in northern Sumatra. Here, Mobil operates the 12 trillion cubic foot (tcf) Arun gas field, which generates 47 percent of Indonesia's gas production. At the Arun field, Mobil received a 70 percent increase in well productivity after applying advanced horizontal drilling technology in 1993. Additionally, the installation of booster compression facilities to maintain gas production rates will be completed by 1995. In 1994, the Bontang LNG plant brought a sixth LNG train online for a total plant capacity of 16.98 mst/yr. Completion of a \$750-million, 2.9 mst/yr, seventh LNG train is anticipated in 1997.

In November 1994, Exxon signed a preliminary contract to develop the 45 tcf Natuna natural gas field. The final agreement will be signed in January 1995 after new Indonesian income tax laws take effect. Total investment during Natuna's projected 30-year field life is expected to range from \$6 to \$40 billion, depending on demand. Analysts predict that because of the high development costs, Exxon and Pertamina likely will ask Mobil to join the project. The Natuna field will not become operational until

2002. Production is expected to peak at 67 million cubic meters of gas per day or at 16.5 mst/yr of LNG. An estimated 71 percent of Natuna's 155 tcf of total gas reserves are comprised of carbon dioxide (CO<sub>2</sub>). In comparison, CO<sub>2</sub> makes up only 15 percent of total gas volume processed at Indonesia's two LNG plants. To help reduce greenhouse gas emissions, Exxon plans to reinject the CO<sub>2</sub> 3,000 feet below the ocean floor for permanent storage in underground rock formations. Development costs are expected to be higher not only because of the CO<sub>2</sub> reinjection, but because of Natuna's location in a typhoon-prone section of the South China Sea. Estimated delivery price is set at \$5 to \$5.45 per million Btu. Analysts speculate that Exxon received as high as a 70 percent stake in Natuna's production profits.

### **ELECTRIC POWER**

The Indonesian government is spending \$6 billion under its current five-year development plan to expand the country's electrical generation capacity. This expansion will help to meet the officially-projected 14 percent annual increase in electricity demand. To aid this task, the World Bank has provided a total of \$4.1 billion in loans for 21 electrical projects in Indonesia.

In March 1994, two 400-megawatt (MW) coal-fired plants were commissioned in the Paiton district of

East Java. PLN, the state-owned electricity company, plans to construct six similar plants at Paiton before 1999 for a total generating capacity of 4000 MW. In late 1994, Indonesia secured the financing necessary for the \$2.5 billion Paiton project. The consortium working on the project consists of Mission Energy (32.5%), General Electric (20%), Mitsui (32.5%), and Batu Hitam Perkasa (15%).

The World Bank estimates that Indonesia has 16,000 MW in potential geothermal power. Java alone contains 15 active and 85 dormant volcanoes. In 1994, Unocal put Indonesia's first geothermal energy plants on line in the Gunung Salak geothermal field south of Jakarta. The two 55-MW plants started operations in July and October 1994. Unocal plans to construct two similar plants at the Gunung Salak field by mid-1997. Moreover, the company is conducting geothermal exploration in the Sarulla block in northern Sumatra. As of late-1994, Indonesia's total geothermal capacity was 370 MW.

### **COAL**

The Indonesian coal industry is slated for expansion to supply the demand for new power plants. The country's coal exports and production are expected to rise to 33 Mt/yr and 95 Mt/yr, respectively, by 2001. The primary consumers of Indonesia's lower-rank coal are Japan, Taiwan, Hong Kong, Europe, and the United States. Most coal production in Indonesia takes place in East and West Kalimantan.

# Iran

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### **COUNTRY OVERVIEW**

**Head of State:** Ali Akbar Hashemi Rafsanjani

**Spiritual Leader:** Ayatollah Ali Khamenei

**Population (1994E):** 66 million

**Location/Size:** Persian Gulf/1.648 million sq km (636,363 sq mi), slightly larger than Alaska

**Language:** Persian and Persian dialect (58%), Turkic and Turkic dialect (26%)

**Religion:** Muslim (predominately Shi'a)

**Ethnic Divisions:** Persian (51%), Azerbaijani (24%), Gilaki and Mazandarani (8%), Kurd (7%), Other (10%)

**Defense:** Army (320,000); Revolutionary Guard Corps (120,000); Navy (18,000); Air Force (15,000)

**Major Cities:** Tehran (capital), Isfahan, Mashhad, Shiraz, Tabriz

### **ECONOMIC OVERVIEW**

**Gross Domestic Product (1993E):** \$303 billion

**Currency:** Iranian Rial (IR)

**Official Exchange Rate (5/94):** US\$1=IR1,750

**Current Account Balance (1994E):** -\$5.1 billion

**Foreign Debt (1994E):** \$30 billion

**Crude Oil Export Revenues (1994E):** \$12.4 billion

**Crude Oil Exports/Total Export Revenues:** 90%

**Major Import Products:** Industrial supplies (37%), machinery (30%), consumer goods (18%)

**Major Export Products:** Petroleum (90%), carpets, fruits, nuts, hides

**Major Trading Partners:** Japan, Turkey, Germany

### **ENERGY OVERVIEW**

**Minister of Oil:** Gholamreza Aghazadeh

**Proven Oil Reserves (1/1/94):** 93 billion barrels

**Oil Production Capacity (1994E):** 3.9 million barrels per day (bbl/d)

**Oil Production (1994E):** 3.7 million bbl/d of which 3.64 million bbl/d is crude oil

**Domestic Oil Consumption (1994E):** 1.2 million bbl/d

**Refinery Capacity (1/1/94):** 1.1 million bbl/d

**Net Petroleum Exports (1994E):** 2.5 million bbl/d

**OPEC Production Quota (3Q94):** 3.6 million bbl/d (crude only)

**Natural Gas Reserves (1/1/94):** 730 Trillion cubic feet (tcf)

**Natural Gas Production (1993E):** 0.9 tcf

**Natural Gas Consumption (1993E):** 0.9 tcf

### **OIL AND GAS INDUSTRIES**

**Organization:** National Iranian Oil Company (NIOC) - handles oil and gas exploration and production, refining and oil transportation; National Iranian Gas Company

(NIGC) - manages gathering, treatment, processing, transmission, distribution, and exports of gas and gas liquids; **National Petrochemical Company (NPC)** -

handles petrochemical production, distribution and exports  
**Major Fields:** Gachsaran, Agha Jari, Marun, Ahwaz Asmari, Ahwaz Bangestan

**Major Refineries:** Abadan, Esfahan, Tehran, Arak

**Major Oil Terminals:** Kharg Island, Lavan Island, Sirri



**Major Customers:** Western Europe, Japan, Brazil

### **GENERAL BACKGROUND**

Iran faces serious economic pressures, resulting both from the country's rapid population growth and the need to rebuild following the 8-year Iran-Iraq War that ended in 1988. These economic pressures place a particularly heavy burden on the country's main source of revenues - the oil and gas industry. In order to maximize its oil export revenues, Iran has attempted to increase its own production, as well as to press for higher world oil prices. Iran also hopes to increase production from its huge natural gas reserves, both for export and domestic consumption. Substituting natural gas for domestic oil consumption would also help free up more valuable oil for export.

As part of its efforts to boost domestic oil and gas production, Iran is attempting to attract foreign oil companies after 15 years of internal opposition to foreign ownership. Iran has begun to accept bids, for example, on a series of upstream and downstream projects on Qeshm Island in the strategic Strait of Hormuz, in an effort to entice foreign and private

investment. Qeshm, the biggest island in the Gulf, potentially contains significant oil and gas reserves. Currently, the island has two producing onshore gas fields, Salakh and Gavarzin, as well as two smaller offshore fields, Henquan and West Bukha. Qeshm presents overseas firms with a small-scale opportunity to become equity producers of Iranian oil and gas.

In September 1992, Iran completed its occupation of a disputed island (Abu Musa) near the Strait of Hormuz following 20 years of joint control with the United Arab Emirates (UAE). Along with Abu Musa, two other islands - Lesser Tunb and Greater Tunb - were taken from the UAE in 1971 after the British withdrew from the region.

### **OIL**

Iran has the fifth largest crude oil reserves in the world, estimated at nearly 93 billion barrels. Crude production in 1993 of 3.63 million barrels per day (bbl/d) was about 13% of total OPEC production. Iran's gas reserves of 730 tcf are the largest in the Middle East and the second largest in the world, representing around 15% of the world's total gas reserves.

Although Iranian oil production is consistent with its OPEC quota, recent shortages of Iranian crude have renewed speculation that Iran is having problems maintaining crude production and exports. The rumors of production problems at key Iranian fields have persisted since October 1993 and have been consistently denied by Iranian officials. Minor problems, such as corroded pipelines and staff shortages, are known to afflict some offshore fields. But reports also stress long-term structural problems at the large onshore fields, particularly Ahmaz, Marun and Gachsaran.

To assist its oil industry, Iran signed an oil agreement with Kazakhstan in November 1993. The oil cooperation agreement involves Iran importing up to 100,000 bbl/d of crude oil from Kazakhstan. These imports, which are planned to start at 40,000 bbl/d, would free more Iranian crude for export.

In addition to the country's huge oil reserves, Iran announced the discovery of two new oil reservoirs in late 1993. The latest discovery, Bushehr on the Gulf

coast, has estimated reserves of 1 billion barrels. In August, Oil Minister Aghazadeh declared the discovery of light sweet crude at Dharkovin in Khuzestan. Initial reserve estimates of 7 billion barrels have since been raised to 9 billion barrels. This discovery was the first Iran has announced in more than 2 years.

### **REFINING**

Amid claims that Iran no longer needs to import refined products such as kerosene and gas oil, the country has brought onstream a 25,000 bbl/d hydrocracker at the newly inaugurated Arak refinery in January 1994. The hydrocracker is expected to

produce around 19,000 bbl/d of refined products to help meet domestic needs. The \$1.1 billion Arak refinery, which has an operating capacity of 150,000 bbl/d, is the country's first to produce high octane unleaded gasoline.

### **Petrochemicals**

Iran hopes to begin exporting \$300 million worth of petrochemical products in the not too distant future. Currently, petrochemical production totals 6 million tons annually, compared with only 700,000 tons five years ago. Iran estimates that production will increase to 12 million tons in 1997. In recent years, low Iranian oil revenues have prompted renewed interest in bolstering other industries, such as petrochemicals, to benefit from the value-added revenues.

### **NATURAL GAS**

Iran plans to increase its natural gas consumption over the next few years. The country is currently attempting a large-scale expansion of its natural gas supply network for residential and industrial uses, designed to decrease dependence on more costly kerosene and gas/diesel oil.

In February 1994, Turkey agreed to purchase 2.7 billion cubic meters (95.4 billion cubic feet) of natural gas from Iran, which will eventually be expanded to 5.5 billion cubic meters (194.2 billion cubic feet) by 2015. However, a means of transporting the gas to Turkey has yet to be developed. Construction of a gas pipeline network extending from Iran into Turkey and Europe has been proposed on several occasions, but serious negotiations on such a venture have yet to begin.

In January 1994, the National Iranian Oil Company (NIOC) formally canceled an agreement for an Italian-led group to develop the South Pars offshore gas and condensate field. The group, which consisted of Technologie Progetti Lavori SpA of Rome, Saipem SpA of Milan, Mitsubishi Corporation of Japan, and Machinoimport of Russia, failed to raise 85% of the project's total \$1.7 billion. Iran believes that South Pars is an extension of Qatar's North Dome gas field, the largest proven gas field in the world, into Iranian waters. It estimates reserves in South Pars at 100 tcf of gas and 3-4 billion barrels of condensate.

# Iraq

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## COUNTRY OVERVIEW

**Head of State, Prime Minister:** Saddam Hussein at-Takriti  
**Deputy Prime Minister:** Tariq 'Aziz  
**Independence:** October 3, 1932  
**Population (July 1994E):** 19.9 million  
**Location/Size:** Middle East/437,072 sq km (168,754 sq mi), slightly more than twice the size of Idaho.  
**Major Cities:** Baghdad (capital), Basra, Mosul, Kirkuk  
**Languages:** Arabic, Kurdish  
**Ethnic Groups:** Arab 75-80%, Kurdish 15-20%, Turkoman, Assyrian or other 5%  
**Religion:** 97% Muslim (Shiites 60-65%, Sunni 32-37%)  
**Defense (pre-1991):** Army: 955,000; Air Force: 40,000; Navy: 5,000

## ECONOMIC OVERVIEW

**Currency:** Iraqi Dinar (ID)  
**Official Exchange Rate (10/94):** US\$1 = ID 0.3109  
**Unofficial Exchange Rate (5/94):** US\$1 = ID 370  
**Gross National Product (1993E):** \$38 billion  
**Real GDP Growth Rate (1993):** 3%  
**Inflation Rate (1993E):** 30%  
**Current Account Balance (1992):** \$0  
**Merchandise Exports (1992):** \$353 million  
**Merchandise Imports (1992):** \$477 million  
**Major Export Products (pre-embargo):** Crude oil, sulfur  
**Major Import Products (pre-embargo):** Industrial supplies, capital goods, consumer goods  
**Petroleum Export Revenues (1992):** \$326 million  
**Oil Export Revenues/Total Export Revenues (1992):** 92%  
**Total External Debt (1992):** \$23.1 billion  
**Debt Service (1992):** 25%  
**Total Reserves (non-gold):** N/A

## ENERGY OVERVIEW

**Minister of Oil:** Safa Hadi Jawad  
**Proven Oil Reserves (1/1/94):** 100 billion barrels  
**Oil Production (1994E):** 550,000 barrels per day (bbl/d)  
**Oil Production Capacity (1994E):** 1.5 million bbl/d  
**OPEC Oil Production Quota (3Q94):** 400,000 bbl/d  
**Domestic Oil Consumption (1994E):** 500,000 bbl/d  
**Crude Refining Capacity (1994E):** 570,000 bbl/d  
**Net Oil Exports (1994E):** 50,000 bbl/d  
**Natural Gas Reserves (1/1/94):** 109.5 trillion cubic feet (tcf)  
**Natural Gas Production (1993):** 350 million cubic feet per day (MMcfd)  
**Natural Gas Consumption (1993):** 350 MMcfd  
**Electric Generation Capacity (1994E):** 5,000 megawatts  
**Electricity Production (1993E):** 25.7 billion kilowatt hours

## ENVIRONMENT OVERVIEW

**Total Energy Consumption (1992):** 0.81 quadrillion Btu  
**Energy Consumption per Dollar of GDP:** N/A  
**Energy Consumption per Capita (1992):** 44.5 million Btu  
**Energy-related Carbon Emissions (1992):** 15.9 million metric tons  
**Carbon Emissions per thousand dollars of GDP:** N/A

**Carbon Emissions per Capita (1992):** 0.87 metric tons

## **OIL and GAS INDUSTRIES**

**Organization:** The Oil Ministry oversees the nationalized oil industry including: the Iraq National Oil Company (INOC), responsible for managing exploration and production; the State Organization for Oil Marketing (SOMO); the Iraq Oil Exploration Company (IOEC), responsible for oil equipment manufacturing; the National Company for Distribution of Oil Products and Gas; the Iraqi Oil Tankers Company; and the State Company for Oil Projects (SCOP).

**Major Fields:** East Baghdad, Kirkuk, Rumaila, Zubair, Bai Hassan, Buzurgan

**Major Oil Terminals:** Mina al-Bakr

**Oil Export Pipelines (capacities):** Iraq-Turkey, 1.0-1.2 million bbl/d; Iraq Pipeline-Saudi Arabia (IPSAI), 1.65 million bbl/d (closed to Iraq in 1990); Strategic Pipeline, 0.8-0.9 million bbl/d

**Major Oil Refineries (capacities 1/1/94):** Baiji (300,000 bbl/d), Basra (140,000 bbl/d), Doura (100,000 bbl/d)

**Major Customers:** Due to United Nations sanctions, Iraq exports only limited amounts of oil to Jordan.

## **GENERAL BACKGROUND**

Iraq has been isolated both politically and economically since its invasion of Kuwait in August 1990. Soon after Iraq invaded Kuwait, its overseas assets were frozen and all trade, except for humanitarian purposes, was banned. Iraq remains subject to United Nations sanctions due to the regime's failure to comply fully with terms of the cease-fire agreement. Two major points of contention are Iraq's limited cooperation with UN inspection teams enforcing its concession to destroy all weapons of mass destruction, and its unwillingness to acknowledge Kuwait as a sovereign state. Other barriers, including the mistreatment of the Kurds in northern Iraq and the Shiites in the south, as well as the recent movement of Republican guard troops to the border of Kuwait, have sustained UN resolve to maintain sanctions. Iraq has also refused to accept a UN border agreement which would give Kuwait an area containing Iraqi naval facilities and several oil wells in the Rumaila field.

Another area of contention is Iraq's refusal to accept UN conditions for humanitarian assistance. Under UN resolutions 706 and 712, Iraq is authorized a one-time sale of \$1.6 billion worth of oil. Iraq's



government has continually refused to accept the plan, however, calling it an infringement on Iraqi sovereignty. The plan has been revised and presented several times since, but Iraq has yet to accept.

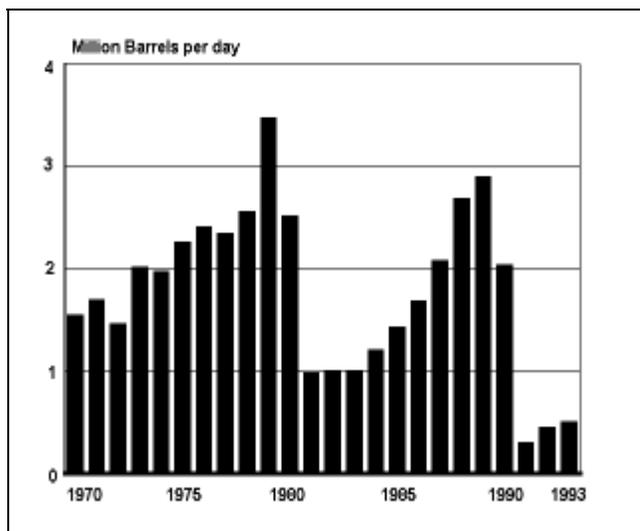
In addition, a proposal to drain some 12 million barrels of oil from the Iraq-Turkey pipeline has been in the works since early 1994 but has yet to get off the ground. Both Iraq and Turkey claim that unless the oil is flushed from the pipeline, the pipeline will be irreparably damaged by the deteriorating crude. Negotiations have failed, however, to reach a satisfactory agreement and are preventing the flushing and repairs from beginning. The delays are due in part to differences concerning the distribution of the humanitarian aid that Iraq would receive as payment for the oil. Iraq has rejected the UN plan that puts 30% of the proceeds into a UN escrow fund for Gulf war victims compensation, while taking control of the distribution of the humanitarian aid away from Iraq. Whether an agreement is made or not, it is unlikely that the flushing and needed repairs will begin until spring, due to the severe weather conditions in the mountains between Iraq and Turkey through which the pipeline passes.

## **OIL**

While Iraq finds it difficult to provide the basic necessities of life for many of its people, it has succeeded in rebuilding much of its war-damaged oil industry. Rebuilding of oil production, processing and export capacity has been a priority for Iraq, since

oil exports are its major potential source of foreign currency. Recently, Iraqi Oil Minister Safa Hadi Jawad claimed that Iraq could export 2 million bbl/d immediately after sanctions are lifted and up to 3.6 million bbl/d within 10-14 months, once it obtained the parts it needs to repair damaged oil export facilities. Iraq's pre-war output was 3.3 million bbl/d.

### **Iraqi Oil Production 1970-1993**



Iraq is already planning future exploration and development with the likely assistance of foreign companies and has established an oil output target of 6 million bbl/d for the turn of the century. It appears to be concentrating on the further exploration and development of four giant southern fields: Majnoun, West Qurna, Halfaya, and Nahr-Umar. It is talking with Russian firms on resuming development of the West Qurna field once the UN sanctions are lifted. Original plans for this field, interrupted by the Iraqi invasion of Kuwait, called for production rates of 200,000 bbl/d in the first stage and 600,000 bbl/d in the second.

Two French companies, Total and Elf, have been negotiating with Iraq as well. Total may develop Nahr-Umar, while Elf is expected to undertake the development of the Majnoun field, by far the largest Iraqi field waiting to be developed. However, no commitments are likely to be made until the uncertain political situation is resolved.

### **REFINING**

Iraq's refining industry was severely damaged during the 1991 Gulf war. In a few short weeks of allied bombing missions, Iraq's refining capacity was reduced from 550,000 bbl/d to 60,000 bbl/d. But by the end of June 1991 enough reconstruction was completed for Iraq to be able to meet domestic demand. Since then Iraq has resumed operations at the three main refineries (Baiji, Basra, and Doura) and has restored additional capacity at several smaller facilities. The Iraqi Oil Ministry claims it has no plans to boost capacity further as all domestic consumption needs are being met by the existing facilities.

### **NATURAL GAS**

Until the development of the al-Anfal natural gas field, Iraq's natural gas production was closely tied to its crude oil production, since all of the gas produced was associated. Most of Iraq's associated gas comes from the Ain Zalah, Butma, Kirkuk, Bai Hassan, Rumaila and Zubair fields.

In May 1990, the al-Anfal gasfield came on-line with an initial production rate of 200 million cubic feet per day and estimated reserves of 4.5 trillion cubic feet. Al-Anfal, Iraq's first non-associated gas field, is connected by pipeline to a gas gathering station near Kirkuk, some 30 kilometers away. From there, the gas is fed into a regional network that supplies feedstock for the petrochemical industry and fuel to power stations.

## ELECTRIC POWER

Most of Iraq's power generation and distribution infrastructure was destroyed by allied air attacks during the Gulf war. As a result, Iraq's generating capacity was slashed from 9,552 megawatts (MW) to 340 MW. A UN report estimates a cost of more than \$12 billion to restore capacity to pre-war levels. The government had claimed at one point that it was back up to 75% of pre-war capacity but, after four years of UN trade embargo, lack of spare parts has shut down much of what had been repaired. Today, the country is only capable of generating an estimated 5,000 MW.

# Kazakhstan

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## COUNTRY OVERVIEW

**President:** Nursultan Nazarbayev

**Independence:** December 16, 1991

**Population (July 1993):** 17.2 million

**Location/Size:** Central Asia/2,717,300 sq km (1 million sq mi), about four times the size of Texas.

**Languages:** Kazakh (official); Russian (language of interethnic communication)

**Ethnic Groups:** Kazakh (41.9%); Russian (37%); Ukrainian (5.2%); German (4.7%); Uzbek (2.1%); Tatar (2%); Other (7.1%)

**Religions:** Muslim (47%); Russian Orthodox (15%); Protestant (2%); Other (36%)

**Major Cities:** Almaty (capital); Karaganda; Shymkent

## ECONOMIC OVERVIEW

**Gross Domestic Product (1993E):** \$60.3 billion

**Currency:** Tenge

**Exchange Rate (7/1/94):** 42.9 Tenge = \$1 U.S.

**Real GDP Growth Rate (1993E):** -13%

**Exports (1994E):** \$3.5 billion (\$1.3 billion outside FSU)

**Imports (1994E):** \$3.7 billion (\$358.3 million from outside FSU)

**Major Import Products:** Machinery and parts; industrial materials

**Major Export Products:** Petroleum; ferrous and nonferrous metals; chemicals; grain; wool; meat

**External Debt (1992):** \$1.5 billion debt to Russia

## ENERGY OVERVIEW

**Oil and Gas Minister:** Ravil Cherdobayev

**Proven Oil Reserves (1993E):** 3-16 billion barrels

**Oil Production (1993E):** 460,000 barrels per day (bbl/d); of which 390,000 bbl/d is crude oil

**Oil Production Capacity (1994E):** 460,000 bbl/d

**Domestic Oil Consumption (1994E):** 254,000 bbl/d

**Refining Capacity (1993E):** 365,000 bbl/d

**Net Oil Exports (1994E):** 206,000 bbl/d

**Natural Gas Reserves (1993E):** 83 trillion cubic feet

**Natural Gas Production (1994E):** .2 trillion cubic feet

## OIL AND GAS INDUSTRIES

**Organization:** The oil industry is administered by state company Kazakhstanmunaigaz. Its main divisions are: Mangystaumunaigaz (Atyrau province); Embanaft (Atyrau province); Temirmunai (Aktyubinsk province); Kazakhstankaspiishelf (Caspian Sea); and Tengizmunaigaz (Tengiz oil field).

**Major Oil Fields:** Tengiz; Korolev; Tenge

**Major Gas Field:** Karachaganak



**Major Foreign Oil Company Involvement:** Chevron; British Gas; Agip; Elf-Aquitaine; Anglo-Dutch; Halliburton

**Major Oil Ports:** None; small tanker shipments to Baku and up the Volga River to Volgograd from ports at Atyrau and Aktau.

**Oil Export Pipelines:** Atyrau to Russian cities of Orsk, Volgograd, and Samara.

**Major Oil Refineries:** Pavlodar; Atyrau; and Shymkent

### **GENERAL BACKGROUND**

Kazakhstan, the second-largest former Soviet republic (after Russia), declared its sovereignty from the Soviet Union on October 25, 1990, and became an independent country on December 16, 1991. Kazakhstan's importance as an independent country arises because of its size, wealth in natural resources, and possession of nuclear arms inherited from the former Soviet Union. Among former Soviet republics, Kazakhstan ranks second in area, fourth in population, third in economic output, and third in both energy production and consumption.

Although it contains vast natural resources, including oil, coal, and agricultural land, Kazakhstan's economic situation has deteriorated sharply since independence, with GDP falling 12.3 percent in 1993, and an estimated 11.5 percent in 1994. Kazakhstan also remains highly dependent on trade with Russia, exchanging natural resources for finished consumer and industrial goods. This is a legacy from the central economic policies of the former Soviet Union, in which Kazakhstan's economy was directed largely

from Moscow and highly integrated with economies of the other republics.

Economically and technologically, Kazakhstan remains relatively underdeveloped and reliant on Russia. Since independence, however, Kazakhstan has moved to decentralize its economy and to attract foreign aid and investment, particularly from the West. In April, Kazakhstan's State Property Committee held its first privatization auction, offering shares in 50 of the country's state-owned enterprises. In February 1994, the United States pledged nearly \$400 million in aid to Kazakhstan after Kazakhstan agreed to adhere to the Nuclear Non-Proliferation Treaty and destroy its nuclear weapons.

Kazakh independence has brought into the open long-suppressed ethnic and religious grievances between non-Muslim Russians - many of whom are a legacy of Stalin's resettlement policies - and mainly Muslim Kazakhs. Today, ethnic Kazakhs constitute a slight plurality of the population, with ethnic Russians close behind. The country's 6 million Russians, however, were the favored class under Communism, a situation resented by much of the country's Kazakh population.

In March 1994, Kazakhstan held its first post-Soviet parliamentary elections, with centrist parties supportive of President Nazarbayev winning the majority of seats. Kazakhstan's parliament voted in early July to move the country's capital by the year 2000 from Almaty in remote southeastern Kazakhstan to Akmola, a city of 300,000 located near the nation's center.

### **OIL**

After Russia, Kazakhstan is the second largest oil producer among former Soviet republics. In 1993, Kazakhstan produced about 460,000 bbl/d of oil, including 390,000 bbl/d of crude oil. This represented a decline from 1992 oil production of 520,000 bbl/d (including 440,000 bbl/d of crude). The decline in Kazakhstan's oil production between 1992 and 1993 was due to shortages of cash and equipment, along with constraints on pipeline capacity, much of which is controlled by Russia. Kazakhstan's oil production is exported largely to Russia as part of a swap arrangement whereby Russia supplies crude to two of Kazakhstan's three

refineries (at Pavlodar and Shymkent). Kazakh crude oil exported to Russia is generally refined at Samara and Ufa.

In December 1993, Kazakhstan and a consortium of Western oil companies (including Mobil, British Gas, Agip, Total, British Petroleum, Statoil and Shell) signed an agreement to explore and develop potentially massive oil and gas reserves located underneath the Caspian Sea.

In April 1993, Chevron concluded a \$20 billion, 50/50 joint venture deal with Kazakhstan (Tengizchevroil) to develop the Tengiz oil field, located in the North Caspian Basin. Discovered in 1979, Tengiz is estimated to contain 3-10 billion barrels of oil, although it currently produces only about 50,000 bbl/d. Chevron believes that production from Tengiz could reach 130,000-140,000 bbl/d rapidly, but is constrained by lack of an export outlet. In early 1994, Chevron announced cutbacks in its \$20 billion Tengiz joint venture due to frustration with the lack of progress in this area. Given adequate export outlets, Chevron believes it can reach peak production of 750,000 bbl/d from the field by 2010.

If constructed, the proposed \$1.4 billion Caspian Oil Pipeline Project between Kazakhstan, Oman, and Russia would represent a major link between Tengiz and European export markets via the Russian Black Sea port of Novorossiysk. In May 1994, however, talks between Kazakhstan, Oman, and Russia were suspended indefinitely as a result of Chevron's refusal to guarantee the pipeline's cost.

Exports from Tengiz have also been constrained by the presence of mercaptans - corrosive, foul-smelling compounds of carbon, hydrogen, and sulfur - in the oil.

On June 17, 1994, President Nazarbaev appointed a new oil and gas minister, Ravil Cherdobayev (a former director of Tengizchevroil) to replace the previous energy minister, Kadyr Baikenov. The former Fuel and Energy Ministry was split into two parts: Oil and Gas, and Coal and Power.

### **REFINING**

Kazakhstan contains three refineries (at Pavlodar,

Atyrau, and Shymkent) which supply population centers in, respectively, the northern, western, and southern areas of the country. In addition, Kazakhstan exports products to Kyrgyzstan and southern Siberia. Kazakhstan's refineries are supplied by crude from Western Siberia transported by pipeline.

Kazakhstan is pushing a major overhaul of its refining industry. In April 1994, a Japanese consortium agreed to construct a \$1.5 billion, 60,000 bbl/d refinery on the eastern Caspian shore. Kazakhstan has also let a \$1.2 billion contract to France's Krebs-Eurysis to modernize Atyrau, enabling it to produce more light products and to upgrade its overall capacity from 103,800 bbl/d to 120,000 bbl/d.

### **NATURAL GAS**

Kazakhstan has around 83 trillion cubic feet of natural gas reserves, of which about 62 Tcf are non-associated. The giant Karachaganak field, located in the northwestern part of the country, alone contains about 46 Tcf of natural gas. An extension of Russia's Orenburg field, it is being developed by British Gas and Agip of Italy.

In recent years, Kazakhstan has produced between 200-250 billion cubic feet of natural gas annually - about 1 percent of former Soviet natural gas output. Kazakh gas production has been constrained largely by a lack of infrastructure, especially pipelines connecting gas-producing areas in the northwest of the country to gas-consuming areas in the south and east. As a consequence, Kazakhstan has been forced to export its gas production to Russia, and to meet 90 percent of its own natural gas consumption needs by imports (mainly from Turkmenistan, Russia, and Uzbekistan).

### **COAL**

Kazakhstan is a major coal producer, consumer, and exporter, with output centered in the Karaganda and Ekibastuz basins. Karaganda, located in north-central Kazakhstan, produces high quality coking coal, which supplies Russian (Urals) and Ukrainian iron and steel industries. Ekibastuz, located in northern Kazakhstan, is the third largest coal basin in the former Soviet Union, producing mainly brown (sub-bituminous) coal for use in power plants. Overall, Kazakhstan

produces about 125 million tons of coal per year, of which 85 million tons are consumed domestically in coal-fired power plants.

Kazakh coal production has declined in recent years due to shrinking markets for coal in its traditional market - the former Soviet Union. As coal production has declined, coal miners have felt threatened and have demanded employment and wage guarantees from the government. Partly in response to these demands (and partly due to budgetary pressures), the Kazakh government decided in early 1994 to free coal prices and reduce coal subsidies, effective May 1, 1994.

### **ELECTRIC POWER**

Although Kazakhstan is a significant exporter of coal and crude oil, it remains a net importer of electricity. A consortium of German and Turkish companies, led by Siemens of Germany, plans to construct a 954 MW natural gas-fired, combined-cycle power plant in the Aktyubinsk region of western Kazakhstan.

# Nigeria

## COUNTRY OVERVIEW

**Head of State:** General Sani Abacha

**Population (1993):** 95 million

**Location/Size:** West Africa/923,770 sq km (356,700 sq mi), slightly more than twice the size of California

**Languages:** English (official), Hausa, Ibo, Yoruba, Fulani

**Defense:** Army (62,000); Navy (4,500); Air Force (9,500)

**Religion:** Muslim (50%), Christian (40%)

**Ethnic Divisions:** Hausa, Fulani, Yoruba, Ibos

**Major Cities:** Abuja (capital), Lagos, Ibadan, Ogbomosho, Kano, Kaduna

**Import Products:** Consumer goods, capital equipment, chemicals, raw materials

**Export Products:** Oil, cocoa, rubber

**Major Trading Partners:** United States, United Kingdom, Germany

## ECONOMIC OVERVIEW

**Monetary Reserves (02/94, Non-Gold):** \$1.4 million

**External Debt (02/94):** \$28 billion

**Gross Domestic Product (1993E):** \$95.1 billion

**GDP Real Growth Rate (1992E):** 4.1%

**Currency:** Naira

**Exchange Rate (01/94):** US \$1 = 22 Naira

**Current Account Balance (1994E):** -\$2.7 billion

**Petroleum Export Revenues (1994E):** \$10.5 billion

**Oil Export Revenue/Total Export Revenue(1994E):** 96%

## ENERGY OVERVIEW

**Minister of Petroleum Resources:** Don Etiebet

**Proven Oil Reserves (1/1/94):** 17.9 billion barrels

**Production Capacity (2Q94):** 2.2 million barrels per day (bbl/d)

**Total Oil Production (2Q94):** 2.0 million bbl/d of which 1.88 million bbl/d is crude oil

**OPEC Quota (3Q94):** 1.865 million bbl/d

**Domestic Oil Consumption (1994E):** 300,000 bbl/d

**Refining Capacity (1/1/94):** 433,250 bbl/d

**Petroleum Exports (1994E):** 1.6 million bbl/d

**Oil Exports to the United States (1993):** 738,000 bbl/d

**Natural Gas Reserves (1/1/94):** 120 Trillion cubic feet (Tcf)

**Natural Gas Production (1993E):** 0.22 Tcf

**Natural Gas Consumption (1993E):** 0.21 Tcf

## OIL INDUSTRY

**Organization:** The Nigerian National Petroleum Co. (NNPC) manages the state-owned oil industry

**Major Ports:** Lagos, Port Harcourt, Calabar, Sapele, Warri, Onne

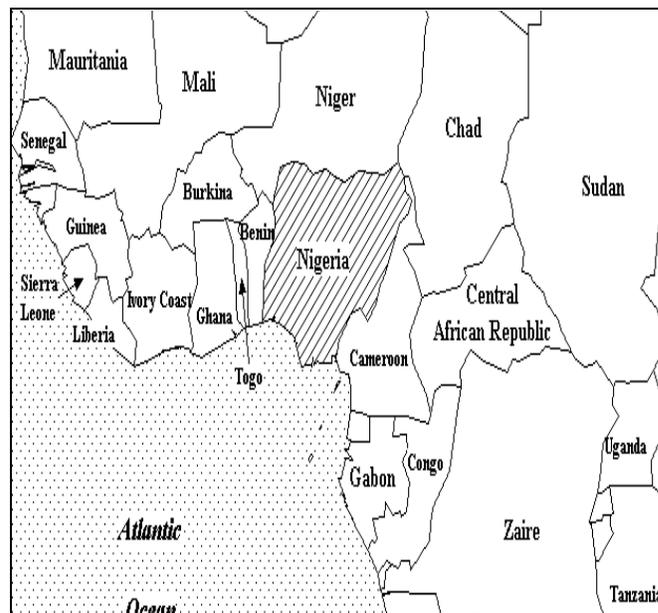
**Major Fields:** Forcados, Meren, Okan, Obagi, Oben, Odudu,

Afia, Oso, Escravos

**Major Refineries:** Port Harcourt (Alesa Eleme, Rivers State), Warri, Kaduna

**Major Oil Companies:** Shell, Chevron, Mobil, Agip, ELF, Texaco

**Major Customers:** United States, Spain, France, Germany, United Kingdom



## GENERAL BACKGROUND

On October 1, 1979, Nigeria elected its first President, Alhaji Shehu Shagari, when the military regime transferred power to newly-elected civilian authorities. After being elected to a second term in October 1983, Shagari was ousted by a military coup led by Major General Muhammadu Buhari in December 1983. On August 27, 1985, another military coup led by General Ibrahim Babangida overthrew Buhari's regime and established a new military administration. On August 26, 1993 an interim government established by General Babangida was created and civilian Ernest Shonekan was sworn in as Nigeria's new leader. The interim government was dissolved in a November 17, 1993, military coup led by Defense Minister General Sani Abacha, who then assumed control of the country.

In early July 1994, Nigeria's two main oil workers unions, the National Union of Petroleum and Natural

Gas Workers (NUPENG) and Petroleum and Natural Gas Senior Staff Association (PENGASSAN), walked off the job in a pro-democracy strike. The strike was a direct result of the annulment of the June 1993 presidential election, in which Moshood Abiola was declared the apparent winner. Abiola, a wealthy businessman, was charged with treason after he declared himself president to mark the anniversary of the election.

About a month later, in early August, Nigeria's largest labor union, the National Labor Congress (NLC), joined the nationwide strike. The NLC, which represents 5 million members in 41 trade unions, eventually suspended its walkout to allow for further negotiations with the military government. However, it continued to support the strike.

The strike has had an adverse effect on Nigeria's oil production and exports. Shell, the largest producer in Nigeria, said its output has been cut substantially due to the strike. The company, which produces about half of Nigeria's total output, also declared that oil loadings at its Bonny and Forcados terminals will be delayed by 6 to 8 days from the original loading dates.

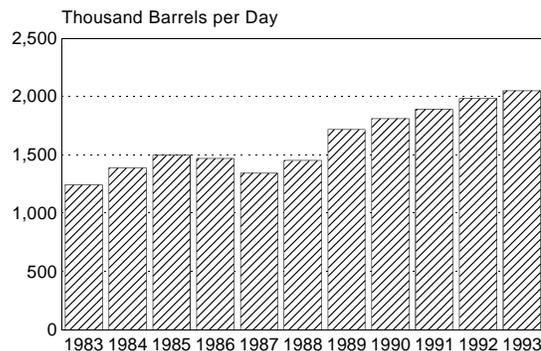
Other companies affected by the strike are Chevron, which produces about 280,000 bbl/d, and Texaco, which is cutting back to 60,000 bbl/d. Mobil claims that it is continuing at its usual volume of around 170,000 bbl/d, and Elf Aquitaine asserts that it is maintaining its normal output level of 100,000 bbl/d.

Other industries are being affected as well. The National Electric Power Authority, Nigeria's power company, says that fuel shortages could force the closing of four natural gas-powered plants that supply 65% of Nigeria's electricity. Many banks and businesses are closed, while the transportation sector is virtually at a standstill. Aviation workers, including pilots and air traffic controllers, generally have supported the strike.

## OIL

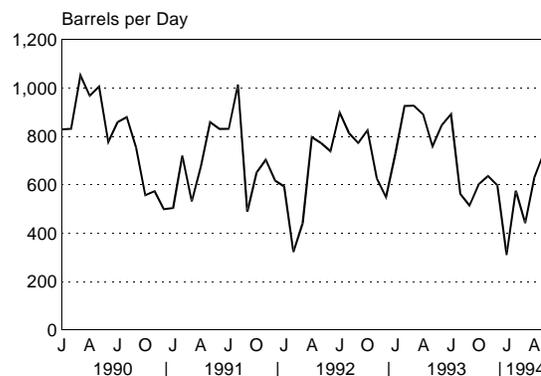
Since the early 1970s, Nigeria has been Africa's largest petroleum producer. Its high-yield, low-sulphur crude oil has made Nigeria attractive to oil refiners. Nigeria joined OPEC in 1971 and has relied

## Nigerian Crude Oil Production 1983 - 1993



on oil for around 96% of total export earnings since 1973.

## Nigerian Petroleum Exports to the United States January 1990 - May 1994



The Nigerian government has been promoting investments in oil exploration, expansion of production capacity, and development of natural gas resources. Nigeria has taken an aggressive role in encouraging investment through the introduction of more competitive methods to sell oil concessions and incentives for companies to invest. However, it is unclear how the current unrest will affect future investment in the oil industry. Nigeria's goals are to increase oil reserves to 20 billion barrels, raise production capacity to 2.5 million bbl/d by 1995, expand downstream operations, utilize natural gas

resources, and diversify income sources.

To assist Nigeria in maintaining oil production, state-owned Nigerian National Petroleum Company (NNPC) applied for approval from Nigeria's federal government to buy five new oil concessions which would enable NNPC to sustain production levels over the coming 15 years.

In September 1993, Nigeria introduced its newest crude oil, Odudu Blend, which is similar in quality to Nigeria's benchmark grade, Bonny Light. Bonny Light, which has a gravity of about 37° API and a sulfur content of only 0.1%, along with the Odudu Blend, are particularly suited for the production of light products, such as gasoline and jet kerosene.

The new blend is produced by an offshore joint venture between Elf Petroleum Nigerian Limited, a subsidiary of state-controlled French oil company Elf Aquitaine, and NNPC. The joint venture comprises two producing fields, Afia and Odudu, and two others, Ime and Edikan, that are not in production as of yet. The four fields combined have estimated recoverable reserves of 750 million barrels of oil, and are expected to produce about 100,000 bbl/d by 1995.

### **NATURAL GAS**

To promote increased use of gas in Nigeria, Chevron and NNPC are planning a \$570 million associated gas-gathering project which will collect about 170 million cubic feet of gas daily. The project would also include the processing of natural gas liquids for sale as liquefied petroleum gas, which would be supplied to the Nigerian gas company for distribution to the local market.

In May 1994, Nigeria Liquefied Natural Gas Limited (NLNG) claimed that it had acquired sufficient capital to fund construction of the proposed \$4.5 billion

Bonny Island liquefied natural gas export terminal. This project, which was put on hold in December 1993 due to the failure of shareholders to sort out financial arrangements and technical contracts, is scheduled to come onstream by the year 2000. Equity interests in this project include NNPC at 49%, Shell at 24%, Elf at 15%, Agip at 10%, and the International Finance Corporation at 2%. The LNG export plant project is expected to produce about 103.5 million metric tons of LNG over the course of its more than 20-year life, earning about \$12 billion in exports.

# North Sea

production)  
**Major Companies:** Statoil, Norsk Hydro, Shell, Mobil

North Sea oil production comes mainly from the United Kingdom and Norway, with smaller amounts contributed by Denmark, the Netherlands, and Germany. North Sea crudes are generally light with a low sulphur content. Oil production in the North Sea, including natural gas liquids, reached a record level of 5.1 million barrels per day (bbl/d) in the fourth quarter of 1993, compared to 4.6 million bbl/d for the same period in 1992. Overall production in 1993 totaled 4.6 million bbl/d (4.3 million bbl/d in 1992). The following provides details on the North Sea's two largest producers - the United Kingdom (U.K.) and Norway.

## **ENERGY OVERVIEW - United Kingdom**

**Minister of Energy:** Tim Eggar

**Proven Oil Reserves (1/1/94):** 4.55 billion barrels

**Offshore Oil Production Capacity (4Q93):** 2.4 million bbl/d

**Offshore Oil Production (4Q93):** 2.3 million bbl/d

**Oil Consumption (1993E):** 1.8 million bbl/d

**Total Gross Oil Imports (1993E)** 1.4 million bbl/d

**Total Gross Oil Exports (1993E):** 1.75 million bbl/d

**Natural Gas Reserves (1/1/94):** 22 trillion cubic feet (Tcf)

**Natural Gas Production (1993E):** 2.0 Tcf

**Natural Gas Consumption (1993E):** 2.2 Tcf

**Natural Gas Net Imports (1993E):** 0.2 Tcf

**Major Trading Partners:** United States, Germany, France, Belgium/Netherlands/Luxembourg (Benelux), Italy

**Major Systems:** Brent, Ninian, Forties, Flotta (combined represent approximately 80% of U.K. oil production)

**Major Fields:** Brent, Forties, Magnus, Beryl

**Major Companies:** British Petroleum, Shell, Exxon

## **ENERGY OVERVIEW - Norway**

**Minister of Industry and Energy:** Jens Stoltenberg

**Proven Oil Reserves (1/1/94):** 9.3 billion barrels

**Oil Production Capacity (4Q93):** 2.6 million bbl/d

**Oil Production (4Q93):** 2.6 million bbl/d

**Oil Consumption (1993E):** 0.2 million bbl/d

**Total Gross Oil Exports (1993E):** 2.3 million bbl/d

**Natural Gas Reserves (1/1/94):** 71 Tcf

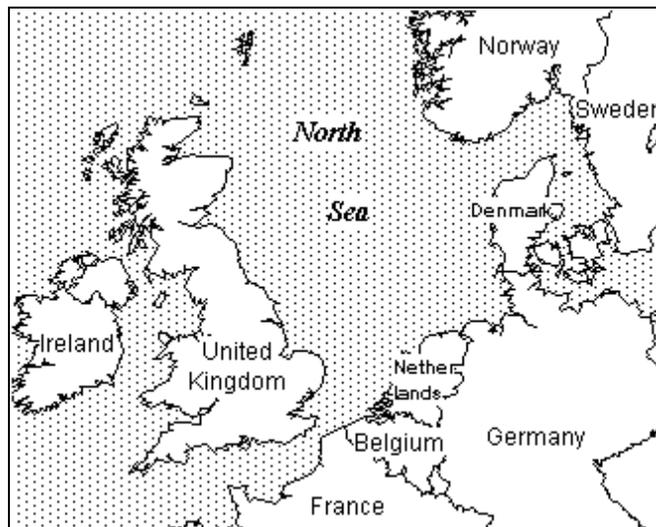
**Natural Gas Production (1993E):** 1.0 Tcf

**Natural Gas Consumption (1993E):** 0.1 Tcf

**Natural Gas Net Exports (1993E):** 0.9 Tcf

**Major Trading Partners:** Germany, Sweden, United Kingdom

**Major Fields:** Statfjord, Gullfaks, Oseberg, Ekofisk (combined represent about 76% of Norway's oil



## **UNITED KINGDOM**

### **GENERAL BACKGROUND**

Perhaps the main advantage of the U.K.'s North Sea fields is that they are located in a politically stable country in close proximity to Europe's main refining centers and industrial markets. The British government is further seeking to exploit this advantage through a new plan to use the existing infrastructure in the region more effectively, in the hope that this will lead to more development of smaller fields. The country also has one of the most attractive tax regimes for oil and gas exploration and production.

### **OIL**

U.K. oil production, including natural gas liquids, comes from four major field systems (Brent, Ninian, Forties, Flotta) and individual fields located in the North Sea. U.K. North Sea oil production began in 1975, and in the mid-1980s hit peak production levels

of 2.7 million bbl/d. Production began to decline in 1987 and fell below 1.9 million bbl/d in 1991 before increasing modestly in 1992 and 1993.

The United Kingdom maintains an unusual position in the oil industry by being both a major importer and a major exporter. Since the U.K. produces a high quality oil, it exports this oil and imports crude oils of various qualities, which are mixed together with some domestic crude oil for refinery purposes.

U.S. companies are becoming a larger force in the U.K. oil industry. One-third of the forecasted 200,000 bbl/d increase in the U.K.'s offshore oil output in 1994 is to be provided by the Alba field, which is operated by Chevron. Alba came onstream in mid-January 1994. Chevron expects early production of 50,000 bbl/d will rise to a peak of 70,000 bbl/d late in 1994. The oil from the Alba field flows from a platform to a floating storage unit, and is then shipped to refineries in Northwest Europe.

A group led by Texaco began oil production from the Strathspey field in late December 1993. The field, which was discovered in 1975, is expected to have gross peak production of 45,000 bbl/d of liquids and 114 million cubic feet per day (MMcf/d) of natural gas, of which Texaco's share will be 30,000 bbl/d and 76 MMcf/d. Strathspey is controlled from the nearby Ninian Central platform, where the oil is processed. Total Strathspey reserves are 80 million barrels of oil, 334 billion cubic feet (Bcf) of gas, and 10 million barrels of natural gas liquids.

Texaco expects to boost its North Sea oil production to around 200,000 bbl/d by the end of the decade, in part through new drilling and development technology. The company plans to spend \$400 million annually in the North Sea over the next three years. It plans to use newly developed technology that allows it to operate wells and control the flow of oil with equipment on the seafloor that is tied into an existing oil platform. According to Texaco, this "subsea technology" reduces development costs by about half. Although Texaco must pay a tariff to the owners of the oil platform and pipelines through which it moves its oil (an arrangement which increases the cost somewhat), investment in sub-sea technology is less costly than constructing a full-

fledged platform.

Another U.S. company, Kerr-McGee, began oil production at the Gryphon field in October 1993. This field is expected to peak at 50,000 bbl/d by mid-1994, with total production estimated at about 96 million barrels over the 15- to 20-year life of the field. The development cost was approximately \$384 million. The Gryphon field is the second of three North Sea fields scheduled for production in which Kerr-McGee has an interest.

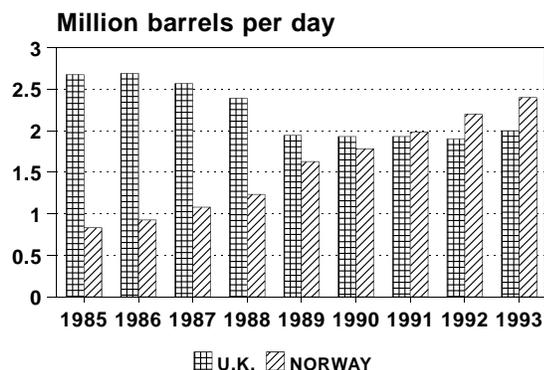
Oil began flowing from the Scott field, which is connected to the Forties pipeline system, in September 1993, four months ahead of schedule. U.S. company Amerada Hess stated that the field reached its output capacity of about 180,000 bbl/d in October 1993. The Scott field is the largest U.K. North Sea oilfield to come onstream so far in the 1990s. Recoverable reserves are estimated at 450 million barrels of crude oil and 287 Bcf of natural gas. Other U.S. companies involved in the Scott field are Amoco, Mobil, and Kerr-McGee.

#### **NATURAL GAS**

In January 1994, Exxon received U.K. government approval for the \$260 million development of Exxon/Shell reserves in the Barque South field and an extension of the Barque field. The development project will add 700 Bcf of reserves to those already developed in this area. Exxon and Shell each hold a 50% interest in the project and production is expected to begin in October 1994.

In May 1993, the U.K. surprised its continental neighbors by stating that it plans to end its 30-year isolation from the main European gas market by building a major export pipeline to Belgium. The pipeline, which is expected to have a capacity of 530 Bcf/year, is to be built from Bacton on England's east coast to Zeebrugge in Belgium. The first gas likely to enter the proposed pipeline would come from the Britannia field, which is jointly operated by Conoco and Chevron. The Britannia field, which contains roughly 2.5 Tcf of proven gas and is slated to begin production in 1997, is the biggest U.K. offshore gas field currently being developed.

## Total Liquids Production United Kingdom and Norway



### NORWAY

#### GENERAL BACKGROUND

Norway has had difficulty reaching agreement with the European Union on several energy-related issues, including ownership of the country's large oil and natural gas resources. The problem stems from the country's production sharing requirement, which gives 50% of foreign companies' oil and gas production to Statoil. In February 1994, the EU offered Norway incentive to become a member of the Union by allowing it to maintain state holdings in the oil and gas companies, manage its own energy resources, and levy taxes on exploration and development activities.

#### OIL

Norway is considered to have the North Sea's best potential for crude oil and natural gas production. As Western Europe's largest oil producer, Norway produced 2.4 million bbl/d of oil (including natural gas liquids) from its North Sea fields in 1993. Though low oil prices have forced significant cuts in exploration activity, further growth is expected over the next few years.

In response to concerns of the Norwegian Petroleum Directorate regarding safety issues, Phillips Petroleum submitted two proposals in January 1994 to upgrade the 10-platform Ekofisk complex, which incorporates the world's largest oil and gas transportation system. The Ekofisk

complex exports about 560,000 bbl/d to Teesside, England, and about 2 Bcf/d of gas to Emden, Germany.

## Major North Sea Fields

Oil Fields	1992 Oil Production*	Remaining Reserves**
<b>U.K.</b>		
Brent	224	539
Forties	166	325
Magnus	141	333
Beryl	105	982
Fulmar	84	98
Alwyn North	78	76
<b>Norway</b>		
Statfjord	686	730
Gullfaks	480	893
Oseberg	443	919
Ekofisk Area	216	1,299

\* Oil production is represented in thousand barrels per day.

\*\* Reserves are represented in million barrels.

The first proposal, named Ekofisk 2 and budgeted at \$3-\$4 billion, is conditional upon the Norwegian government: 1) extending Phillips' license from the current 2011 deadline to 2031 (the estimated end of the field's economic life); 2) exempting the 10% royalty charged for future oil and gas production; 3) deferring the removal of existing structures until after 2011; and 4) approving a commercial plan for three new partnerships to handle processing and transportation facilities.

The second option, known as Ekofisk 2011 and budgeted at \$2-\$3 billion, centers on a new oil- and gas-processing platform near the existing Ekofisk tank. The platform would replace most of the tank's current functions. Norway is aiming to

make its choice between the two options by the spring of 1994 in order to meet the planned 1998 start-up date.

In late 1993, Norway was successful in getting production started in several new fields. In October 1993, Shell's Draugen field produced in the range of 25,000-40,000 bbl/d and is expected to produce at around 90,000 bbl/d in mid-1994. Shell is optimistic that the Draugen field has the potential to produce up to 1 million bbl/d. The \$1.7 billion project was designed to tap the field's 430 million barrels of liquids and 65 Bcf of gas. The crude oil is exported by tanker and the gas is initially being reinjected.

In September and October 1993, two Norwegian-based companies, Norsk Hydro and Neste Petroleum Norge, began oil production from the 250 million barrel Brage field, three months earlier than planned. Oil production has remained stable at 30,000 bbl/d and will gradually be increased until the field's production capacity of 85,000 bbl/d is reached. The total investment in the Brage production platform and related oil and gas pipelines is around \$1 billion. The recoverable reserves of the Brage field are estimated at 250 million barrels of oil and 100 Bcf of natural gas. Total oil production of about 242 million barrels is expected during the field's planned production life of 13 years. Norway's Snorre field recently experienced unexpectedly high associated gas flows, which threaten to interfere with rising crude oil production. This surprisingly high gas-to-oil ratio is challenging capacity at Statoil's Statfjord A platform, which processes all gas and crude oil for the Snorre field. The field operator, Saga Petroleum, Norway's biggest independent oil company, received temporary permission to flare up to 39 MMcf of excess gas. The peak output for the Snorre field is slated to be 170,000 bbl/d.

billion Troll agreements cover total supplies of 35 Tcf to Austria, Belgium, France, Germany, the Netherlands and Spain over a 30-year period. Overall supplies from the Troll field, Europe's biggest offshore gas field, are expected to peak at 1.6 Tcf/year in 2005. The partners in the Troll project are Shell, Statoil, Norsk Hydro, Elf, Saga Petroleum, Conoco and Total. Although the 46-Tcf Troll field has not yet come on-line, deliveries under the Troll agreements started from the East Sleipner field, despite the fact that its platform base sank two years

## **NATURAL GAS**

In October 1993, the first gas under the world's biggest gas supply contract began to flow to mainland Europe from Norway. Signed in 1986, the \$100

ago and had to be rebuilt from scratch. Between them, Troll and East Sleipner should also pump about 200,000 bbl/d of liquids by 2000. Two new pipeline systems to continental Europe - Zeepipe and Europipe - are required by the Troll agreements. Zeepipe was laid from the Norwegian North Sea to Zeebrugge, Belgium, and began operation in October 1993. The Europipe, which will come ashore in Germany, is scheduled for completion in 1995. Norpipe, an existing pipeline built in 1977 to Emden, Germany, will also be used for Troll agreement deliveries. Norway may even require a fourth gas pipeline to the European continent to handle increased sales.

# Russia

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## COUNTRY OVERVIEW

**President:** Boris N. Yeltsin  
**Premier:** Victor S. Chernomyrdin  
**Independence:** August 24, 1991 (from Soviet Union)  
**Population (7/94E):** 150 million  
**Location/Size:** Eurasia/17,075,200 sq km (6,592,850 sq mi), slightly more than 1.8 times the size of the United States  
**Major Cities:** Moscow, St. Petersburg, Yekaterinburg, Irkutsk, Murmansk, Yakutsk, Vladivostok  
**Languages:** Russian, other  
**Ethnic Groups:** Russian (81.5%), Tatar (3.8%), Ukrainian (3%), and 100 other nationalities (11.7%)  
**Religions:** Russian Orthodox, Muslim, other  
**Defense (6/93):** Army (1,000,000), Air Force (170,000), Navy (300,000), Paramilitary forces (220,000)

## ECONOMIC OVERVIEW

**Currency:** Ruble  
**Official Exchange Rate (12/94):** \$1 = 3,300 rubles  
**Gross National Product (GNP) (1993E):** \$775.4 billion  
**Real GNP Growth Rate (1993E):** -11%  
**Inflation Rate (1994E):** 220%  
**Convertible-Currency Current Account Balance (including gold) (1994E):** \$2.8 billion  
**Merchandise Exports (1994E):** \$44 billion  
**Merchandise Imports (1994E):** \$25 billion  
**Major Export Products:** Oil and oil products, natural gas, wood, metals, chemicals, military hardware  
**Major Import Products:** Machinery and equipment, chemicals, consumer goods, grain, meat, sugar  
**Major Trading Partners:** Europe, North America, Japan, the former Soviet Union (FSU), Cuba, others  
**Oil Export Revenues (1994E):** \$14 billion  
**Oil Export Revenues/Total Export Revenues (1993):** 32%  
**Total External Debt (1994E):** \$91.8 billion

## ENERGY OVERVIEW

**Fuel and Energy Minister:** Yuri Shafranik  
**Proven Oil Reserves (1994E):** 50 billion barrels  
**Oil Production (1994E):** 6.0 million barrels per day (bbl/d) of which 5.8 million bbl/d is crude oil  
**Oil Production Capacity (1994E):** 6.2 million bbl/d  
**Oil Consumption (1994E):** 3.2 million bbl/d  
**Crude Refining Capacity (1/1/94):** 6.5 million bbl/d  
**Net Oil Exports (1994E):** 3.0 million bbl/d  
**Major Oil Customers:** FSU, Eastern and Western Europe  
**Natural Gas Reserves (1/1/94):** 1,748 trillion cubic feet (Tcf)  
**Natural Gas Production (1994E):** 18.9 Tcf  
**Natural Gas Consumption (1994E):** 14.7 Tcf  
**Coal Production (1994E):** 307 million short tons (mst)

**Coal Consumption (1994E):** 309 mst  
**Electricity Generation Capacity (1994E):** 213 gigawatts  
**Electricity Production (1994E):** 890 terawatt-hours



### **ENVIRONMENT OVERVIEW**

**Total Energy Consumption (1992):** 32.7 quadrillion Btu  
**Energy Consumption per 1985 Dollar of GDP (1992):** 37.7 thousand Btu (vs. 17.7 thousand Btu in U.S.)  
**Energy Consumption per Capita (1992):** 22 million Btu (vs. 321.8 million Btu in U.S.)  
**Energy-related Carbon Emissions (1992):** 542.6 million metric tons (9 percent of the world total)  
**Carbon Emissions per Thousand 1985 Dollars of GDP (1992):** 0.62 metric tons (vs. 0.29 metric tons in U.S.)  
**Carbon Emissions per Capita (1992):** 3.65 metric tons (vs. 5.3 metric tons in U.S.)  
**Major Environmental Issues:** Radioactive contamination of food and water supplies, acid rain, airborne industrial pollution, leakage of oil products, greenhouse gas emissions

### **OIL and GAS INDUSTRIES**

**Organization:** Rosneftgas (State oil corporation); Nafta Moskva (State crude exporter); Transneft (State pipeline company); Gazprom (State gas producer); Roskontrakt (State supply organization); Rosneft (State holding co.)  
**Major Producing Oil Fields:** Samotlor, Mamontovo, Fedorovsk (West Siberia), Romashkino, Arlan  
**Major Oil Ports:** Novorossiysk, Tuapse, St. Petersburg  
**Oil Export Pipelines outside FSU (Capacity):** Druzhba (Friendship) (1 million bbl/d)  
**Major Oil Refineries (1/1/94 capacity):** Omsk (564,000 bbl/d), Ufa (483,740 bbl/d), Angarsk (462,960 bbl/d), Nizhniy (435,060 bbl/d), Grozny (387,720 bbl/d), Kirishi (386,000 bbl/d)  
**Major Foreign Oil Company Involvement:** Agip, Amoco,

British Gas, British Petroleum, Chevron, Statoil, Conoco, Elf Aquitaine, Exxon, Mobil, Maxus, Neste Oy, Occidental, Texaco, and Total  
**Major Gas Fields:** Urengoi, Yamburg, Zapolyarnoye, Bovanenko, Medvezh'ye, Orenburg (Volga-Urals)  
**Gas Export Pipelines outside FSU (Capacity):** Soyuz, Urengoi, and Progress (1 Tcf each); Northern Lights (0.8 Tcf), Shebelinka-Izmail (0.7 Tcf); West Ukraine (0.1 Tcf)  
**Major Coal Fields:** Kuznets, Timan-Pechora

### **GENERAL BACKGROUND**

During 1994, President Boris Yeltsin maintained Russia's path towards a free-market economy despite parliamentary opposition from communists, conservatives, and Victor Zhirinovskiy's ultra-nationalist Liberal Democratic Party. Throughout the year, he attempted to strengthen his presidential power by replacing several key government officials. Following the Russian ruble's sharp depreciation on October 11, 1994, President Yeltsin responded by installing three successive finance ministers as well as a new, less conservative Central Bank chairman.

Russia's gross domestic product (GDP) fell 18 percent in 1993 and 12 percent in the first half of 1994. As of late 1994, some sectors of the Russian economy showed signs of rebounding slightly. Many economists believe that the decline in GDP is overstated, primarily because the service sector and small businesses are partly ignored by official Russian estimates. Also, newly privatized firms have found it advantageous to under-report income so as to avoid paying federal, state, and local taxes.

Russia's privatization process started in late 1992 with the issue of 148 million vouchers to Russian citizens. By mid-1994, the private sector employed an estimated 60 percent of the workforce. In September 1994, a second phase began in which shares were sold for cash. Total spending by investors during this second phase is estimated at between \$1.5 to \$2 billion. Analysts believe that the next required step in Russia's privatization process is the enactment of bankruptcy laws. However, Russian officials fear the potential for high unemployment and political instability if such laws are implemented. Consequently, in mid-1994, President Yeltsin decreed that bankrupt firms would be auctioned to private buyers instead of going through formal bankruptcy procedures.

Since the start of the reform process, multilateral institutions such as the IMF and the World Bank have urged Russia to pursue tight monetary and fiscal policies as a condition of further lending. As of December 1994, Russia is awaiting approval of a \$6.25 billion loan by the IMF. Approval depends on the Russian Parliament's passage of a 1995 budget which will keep inflation and the deficit under specific levels. The IMF is concerned as well about such issues as oil export taxes and quotas. The elimination of oil export quotas is also an important criterion for approval of a \$600 million World Bank loan aimed at restoring oil production in western Siberia. Overall, Russia has received \$2.9 billion in World Bank loans since joining the Bank in June 1992. In March 1994, the US Export-Import Bank agreed to finance a \$245 million loan to aid the Urals' oil industry. This was supplemented later by an Overseas Private Investment Corporation agreement to finance oil projects.

In 1994, Russia expanded its international activities by joining NATO's "Partnership for Peace" program, signing a "Joint Declaration of Cooperation" with the International Energy Agency, and reaching agreements for economic cooperation with the European Union. Also, in December 1994, Russia signed the European Energy Charter which will help to establish a framework for foreign investment in Russia's energy sector.

## **OIL**

Russian oil production continued to decline in 1994, falling 12.5 percent in 1993 and 11 percent during the first 9 months of 1994. This decline was caused partly by a natural depletion of key producing fields in western Siberia and the Volga-Urals regions. Other factors included insufficient investment and poor technical management, such as the premature use of water injection. Analysts predict that Russian oil output will rise after 1996 to reach possibly 6.6 to 7.2 million bbl/d by 2000 and 8 million bbl/d by 2010.

Western Siberia is the world's second largest proven oil basin and Russia's prime oil-producing region. In contrast, the Volga-Urals region produced 2.2 million bbl/d in 1993, or about half as much as western Siberia. The Arctic region of European Russia is a much smaller producer, but is the location of many

Western joint ventures (JVs). The Far East region surrounding Sakhalin Island is an important area for new exploration and development, with large, unproven oil and gas resources.

Traditionally, a few large oil fields have accounted for the bulk of Russian oil production. In recent years, however, high production quotas and extensive waterflooding operations have led to premature declines in many large fields. As a result, 84 fields accounted for two-thirds of Russia's oil production in 1994, as compared to 20 fields in 1986. Attempts to bring smaller, widely-dispersed fields onstream to compensate for these production losses have resulted in strains on infrastructure and low production rates per well. As of April 1994, over 44,000 wells, or 26 percent of Russia's total, were idle.

Recently, Russian oil and gas producers have faced a financial crisis because of delinquent payments from energy consumers. Large arrears have reduced the availability of investment capital and prompted a shift to hard currency-generating exports outside the former Soviet Union (FSU). Exports within the FSU fell from 800,000 bbl/d in 1993 to 480,000 bbl/d during the first half of 1994. Concurrently, exports to Western Europe were up 12 percent during the first 10 months of 1994. Russia's primary European oil customers are the U.K., France, Italy, Germany, and Spain.

## **Pipelines**

In 1993, the 31,000-mile Russian oil pipeline network utilized only 60 percent of its 13 million bbl/d capacity. Capacity levels varied dramatically depending on the pipeline segment. For instance, usage is at capacity on the route between Tikhoretsk in the northern Caucasus to the port of Novorossiysk. In comparison, the Druzhba line running to Central European refineries typically carries only 500,000 bbl/d and is at 50 percent capacity. State-owned Transneft, which may undergo future privatization, operates the Russian pipeline network. Oil exports are subject to a quota system under which 19 companies are provided special pipeline access and tax breaks. Other companies are constrained to sell their production to the domestic market at reduced prices. As of December 1994, the Russian government stated its intention to eliminate the quota system. In order

to maintain domestic oil supplies, however, a proposed new law would require oil companies to sell 65 percent of their production domestically. Most likely, joint-ventures (JVs) would be exempted from this domestic-sales rule, but since many key export pipelines to Western Europe run at full capacity, any changes to the present system would take away space from existing state-licensed exporters. Therefore, many foreign companies are examining ways to receive priority access to under-utilized export pipelines. Conoco, Agip, and Total are considering the use of the Druzhba line to transport crude oil to Central Europe. Another alternative is the export pipeline connecting with Ventspils, which re-opened in July 1994 following settlement of a dispute between Russia and Latvia concerning ownership.

The port of Novorossiysk is subject to severe storms and was closed several times in 1994. The loading terminal was shut down for a week in March 1994 because tanker access through the Bosphorus Straits was blocked by an accident. Consequently, plans are proceeding for the construction of two ports near St. Petersburg which will have a combined capacity of 900,000 bbl/d. These ports would be linked by a proposed 250-mile pipeline from the oil-rich Timan-Pechora Basin. Also, proposals for a \$500 million, 300,000 bbl/d line extension from St. Petersburg to Finland are under review.

It is estimated that between 5 to 7 percent of Russia's oil production is lost due to accidental leakage. In September 1994, a large oil spill took place near Usinsk in the Komi region north of the Arctic Circle. Estimates of the spill size ranged between 102,000 to 2.3 million barrels. The spill resulted from a pipeline rupture and a subsequent failed attempt to build an earthen containment dike. Since the spill, Western oil companies have been evaluating the risk of shipping oil through weak or over-used segments of Russian pipelines. For example, Conoco installed a modern, environmentally-safe line from its Polar Lights JV, but is forced to utilize the older Komineft pipeline to reach other exchanges on the Transneft system.

### **Independents**

In January 1993, state-owned Rosneftegaz began to split into independent, vertically-integrated oil companies which control production, refining, and

distribution networks. The ultimate creation of ten separate "independents" is planned by the Russian government, which intends to hold a large stake in the companies for a limited time. In December 1994, western Siberia's Noyabrskneftegaz and Surgutneftegaz agreed to merge, thus creating Russia's seventh integrated independent. The merger will make the company the largest in Russia, with a projected combined oil production of 1.2 million bbl/d. Previously, LUKoil was Russia's largest independent, with control of 872,000 bbl/d in Russian oil production and 440,000 bbl/d in refinery output. Currently, LUKoil is undertaking a three-part privatization effort in which it will offer 15 percent of its shares to foreign investors in early 1995. LUKoil is expanding into foreign operations, such as Azerbaijan's Caspian Sea project and ventures in Kazakhstan, Egypt, and Tunisia.

### **Joint Ventures**

At the start of 1994, Russia's 70 officially-registered JVs had invested around \$800 million in the upstream oil sector. The majority of JVs are involved in either applying enhanced oil recovery techniques (EOR) to existing fields or in exploring and developing new fields in western Siberia, the European Arctic, or the Far East. In 1994, JVs accounted for roughly 300,000 bbl/d, or 5 percent, of Russia's total oil production. The regulatory and tax framework for foreign investment in the Russian oil industry is complex. Russia's draft Oil and Gas Law, which was in preparation for 3 years and would have clarified many issues, was passed by Parliament but rejected by President Yeltsin in July 1994. Without the Law's passage, foreign investors are restrained by both the export quota system and the tax framework.

Russia's tax structure is comprised of a profits tax of 32 percent, a Value Added Tax of 23 percent, miscellaneous fees, and a flat export tariff of about \$5/barrel (ECU30/ton). Western analysts estimate that taxes take an average of 60 percent of gross revenue, although that figure can vary widely. Consequently, many JVs produce only a token amount of oil because Russian taxes are based on revenue and not on profit, and firms which lose money can still acquire a tax liability. Additionally, taxes are assessed on projects and not on companies. This tends to reduce incentives for JVs to undertake

risky exploration and development activities.

In mid-October 1994, six JVs were granted a three-year exemption from paying the export tariff. They included Conoco's Polar Lights, Philbro Energy's White Nights, British Gas' KomiArcticOil, Pennzoil's Siberian American Oil, Aminex's Amkoni, and Anderman-Smith's Chernogorskoye. As of December 1994, Russian officials were considering a plan to lower the tariff gradually through 1995 until it reaches \$2.50/barrel (ECU15/ton). Russian officials hope that the resulting loss in tax revenues would be offset by an increase in the domestic price of oil after the quota system is abolished.

Russia's largest JV is Canadian Fracmaster's Yuganskfrakmaster. This JV is involved primarily in the application of EOR techniques to existing western Siberian fields, including Mamontovo. Similar work is being done by Occidental at the nearby Vanyoganneft field. Besides EOR at existing fields, new development is taking place in western Siberia at Philbro's White Nights. White Nights produced only 3,000 bbl/d in 1993 because of high tax rates. In May 1994, Philbro's oil-drilling license was suspended temporarily because of a lawsuit brought by local residents. In August 1994, Conoco's Polar Lights JV began production at the Timan-Pechora basin's Ardalin field. Conoco has invested \$80 million of a projected \$375 million to develop this field. Output is expected to peak at 25,000 bbl/d in 1996. Conoco plans future development of up to one billion barrels of estimated recoverable oil reserves which are located in larger, nearby fields.

In late 1994, Texaco, Exxon, Amoco, and Norsk Hydro were negotiating a development contract in the Timan-Pechora basin. A total investment of \$45 billion is projected during the estimated 50-year life of the 11 area fields. Potential recoverable reserves are between 2 and 5 billion barrels. Texaco plans to invest \$100 million to appraise the Roman Trebsa field, which is the area's largest. A plan to transport crude oil to ice-breaking tankers via a submersible Arctic Ocean pipeline is under consideration. This export route would bypass the heavily-utilized Transneft export pipelines. As of December 1994, talks between Russia and the companies were stalled because of a profit sharing dispute.

In June 1994, a consortium of Marathon, Mitsui, McDermott, Mitsubishi, and Shell signed a \$10 billion production sharing contract to develop the Piltun-Astokhskoye and the Lunskoye fields located offshore of Sakhalin Island. Potential recoverable oil reserves are estimated at 750 million barrels. This deal, named Sakhalin-2, is similar to other nearby development contracts such as Sakhalin-1 and Sakhalin-3. Exxon, Texaco, and Mobil are consortium members on those contracts.

### REFINING

The majority of Russia's 27 refineries were built in the 1940s and 1950s. Most Russian refineries are relatively unsophisticated, with mazut (low-quality residual) representing 37 percent of total output in 1990. Continuing its steep decline, refinery throughput fell 16 percent in 1993 to half of its 1990 level. Capacity utilization also dropped to only 63 percent in 1993. A five-year refinery modernization program was begun in 1993. This program is receiving funding from both domestic and foreign sources. In June 1994, Asea Brown Boveri signed a \$1.5 billion contract with LUKoil to build a refinery in Krasnodar near the Novorossiysk oil export terminal. In October 1994, a consortium led by Austrian Handelsbank agreed to finance the Siberian refining industry's modernization. Also, the Russian government has established refinery export quotas similar to those for producers which allow refiners to generate hard currency for future investment.

### NATURAL GAS

In 1993, Russian natural gas production dropped only 3.5 percent, primarily because output from western Siberian gas fields remained somewhat level. Over 90 percent of Russia's natural gas production takes place in western Siberia. Fields in other producing areas, such as those in the southern Urals, have experienced large declines in output due to both natural and technical reasons. For example, production at the key Orenburg field in the Urals fell 25.5 percent in 1993. Western Siberian gas production is focused heavily on the Urengoi and Yamburg fields in the Tyumen province. Each of those fields contains estimated reserves of over 200 trillion cubic feet (Tcf). However, like many large Siberian gas fields, Urengoi production is in decline, and most future gas exploration and development in

Russia is taking place in the Far East's Yamal Peninsula. Yamal's largest field, Bovanenkovsk, has larger estimated reserves than either Urengoi or Yamburg. Russian officials hope to begin gas production at Bovanenkovsk in 1997, with projected output levels reaching 1.1 Tcf in 2000 and 6.1 Tcf in 2010. This gas is targeted for export to European markets via a proposed 3100-mile pipeline through Belarus and Poland. However, continuous permafrost conditions and environmental concerns have raised regional development costs. As of September 1994, only 29 miles of the pipeline were complete, with construction at a standstill. While government officials expect the gas industry to reach a turning point in 1997, Russia's ability to meet future domestic gas demand will depend heavily on the Yamal Peninsula's development.

State-owned Gazprom operates Russia's 100 largest gas fields, which contain over 70 percent of the country's reserves and over 90 percent of its production. The company also runs an 86,000-mile pipeline grid, owns trading houses in Western Europe, and through its Neste JV is a major force in the Finnish gas market. Gazprom consists of 10 production associations as well as related operating companies and infrastructure managements. In April 1994, the first steps were taken towards privatizing the company. Shares were divided between Gazprom employees, local residents in areas where gas is produced, and the public. The Russian government plans to keep a 40 percent stake in Gazprom for the next 3 years.

Gazprom plans an extensive rehabilitation of its gas pipeline network. Roughly 68,000 miles of the pipeline system have insufficient coatings to withstand corrosion over pipeline design life. In 1994, the European Bank for Reconstruction and Development undertook a \$9 million study to analyze problems in the Russian gas pipeline system. In March 1994, Gazprom received a \$1.6 billion, 13-year loan from Italian and British banks for rehabilitation work on the system.

In 1993 and 1994, Ukraine, Moldova, and Belarus accumulated large debts for gas shipments. As of December 1994, Ukraine owed Gazprom \$1.4 billion, and Moldova had paid for only 4 percent of its gas

purchases. In response, in December 1994, Gazprom cut its Ukrainian gas shipments by 25 percent to 2.1 million cubic feet per day. Subsequently, Ukrainian officials admitted to siphoning off Russian gas intended for Europe to replace these supplies. Over 90 percent of Russian gas exports to Europe run through Ukraine.

### **COAL**

In 1993 Russian coal production declined 9.5 percent. As with other Russian energy sectors, the coal industry is in financial trouble because large debts between suppliers and consumers have led to a lack of investment, inefficient mining, decreased productivity, and dangerous working conditions. State-owned Rosugol comprises 232 mines, 65 open-cast mines, and 68 coal preparation plants. However, there are 28 coal mining associations, which control between 3 to 20 mines each, as well as several independent mines. These latter two groups rival Rosugol's power in terms of responsibility and authority. Most coal is produced in western Siberia's Kuznetsk Basin, which accounted for almost 70 percent of Russia's high-quality coking coal in 1993.

Labor unrest and strikes in the coal industry have increased because of lay-offs and defaults on salary payments. Since mid-1993, over 86,000 coal workers have lost their jobs, and Rosugol plans to lay off an additional 150,000 workers between 1995 and 1997. In October 1993, the Russian government adopted a plan to restructure the coal industry. By 2004, 100 mines will be closed and 42 additional mines, responsible for over half of Russia's coal production, will be modernized. Also, the system of government subsidies to the coal industry was changed to a three-tiered system based on need. Although the government holds a majority share in most coal mining associations, limited privatization of the industry began in 1993. Under IMF pressure in July 1993, the Russian government liberalized coal prices.

### **NUCLEAR POWER**

Safety and security are major concerns surrounding the Russian nuclear industry. Russia's 24 nuclear reactors provided 12 percent of the country's electrical power in 1992. Eleven reactors are of the

older RBMK type and have no outer containment walls. In early 1994, a Russian nuclear safety commission cited 20,000 safety violations, including radiation leaks and stolen uranium. In late August 1994, an accident at the Chelyabinsk-65 nuclear reactor resulted in a small release of radiation. Also, Russian security forces have become more concerned over the possibility of nuclear materials falling into the hands of criminal or terrorist organizations. In August 1994, for instance, German police made six arrests in Munich after discovering a quantity of uranium U-235 suspected of originating from a Russian nuclear reactor.



## Saudi Arabia

### COUNTRY OVERVIEW

**Head of State:** King Fahd ibn Abdul Aziz as-Sa'ud

**Population (1992):** 17.1 million

**Location/Size:** Persian Gulf/1,960,582 sq km (865,000 sq mi), more than three times as large as Texas

**Language:** Arabic

**Religion:** Muslim

**Ethnic Divisions:** Arab 90%, Afro-Asian 10%

**Defense (6/90):** Army 40,000; Air Force 18,000; Navy 9,500; Air Defense Forces 4,000; National Guard 35,000; tribal levies 26,000

**Major Cities:** Riyadh (capital), Jeddah, Mecca

**Major Import Products:** Industrial goods (25%), metal (16%), food (15%)

**Major Trading Partners:** Japan, Western Europe, United States

### ECONOMIC OVERVIEW

**Gross Domestic Product (1993E):** \$194 billion

**Monetary Reserves (Non Gold, 11/93):** \$5.7 billion

**Currency:** Riyal (R)

**Exchange Rate (1/94):** US\$1 = R3.745

**Current Account Balance (1993E):** -\$18.21 billion

**Petroleum Export Revenues (1993E):** \$39 billion

**Petroleum Exports/Total Export Revenues:** 92%

### ENERGY OVERVIEW

**Minister of Petroleum and Mineral Resources:** Sheikh Hisham Mohi ed-Din Nazer

**Proven Oil Reserves (1/1/94E):** 259 billion barrels

**Oil Production Capacity (1Q94E):** 9.9 million barrels per day (bbl/d)

**Oil Production (1993E):** 8.9 million bbl/d (8.2 million bbl/d crude) *Includes 1/2 Neutral Zone shared with Kuwait*

**OPEC Quota (1Q94):** 8.0 million bbl/d (crude only)

*Includes 1/2 Neutral Zone shared with Kuwait*

**Domestic Oil Consumption (1992):** 1.1 million bbl/d

**Refining Capacity (1/1/94):** 1.6 million bbl/d

**Petroleum Exports (1993E):** 7.8 million bbl/d, of which 1.4 million bbl/d is to the United States

**Natural Gas Reserves (1/1/94E):** 183 trillion cubic feet (Tcf)

**Natural Gas Production (1992E):** 1.2 Tcf

**Natural Gas Consumption (1992E):** 1.2 Tcf

## **OIL INDUSTRY**

**Organization:** The Supreme Petroleum Council governs the nationalized oil industry, including *Saudi Arabian Oil Co. (Saudi Aramco)* - crude production, refining and marketing; *Saudi Basic Industries Corp. (SABIC)* - petrochemicals; *Star Enterprise (U.S.)* - 50% Saudi Refining Inc., 50% Texaco; *Ssangyong Oil Refining Co. (S. Korea)* - 35% Saudi Aramco, 65% Ssangyong; *Luberef* (30% Mobil) and *Petrolube* (29% Mobil) - lubricating oil joint ventures; *Vela International Marine Ltd.* - shipping subsidiary; *Aramco Services Co. (Houston)* and *Aramco Overseas Co. (Netherlands)* - services subsidiaries; *Saudi Petroleum International Inc. (New York)* and *Saudi Petroleum Overseas Ltd. (London/Tokyo)* - marketing subsidiaries.

**Major Oil Fields:** Ghawar, Abqaiq, Safaniya, Berri

**Export Refineries (Capacity):** Ras Tanura (290,000 bbl/d), Jubail/Shell (284,000 bbl/d), Yanbu/Mobil (300,000 bbl/d), Rabigh/Petrola (325,000 bbl/d)

**Major Export Pipeline (Capacity):** East-West Pipeline, also known as Petrolina (5 million bbl/d)

**Major Ports:** Ras Tanura, Juaymah, Yanbu

**Major Customers:** Japan, Western Europe, United States

## **GENERAL BACKGROUND**

The fall in world oil prices during 1993 hit Saudi Arabia--the world's biggest oil producer--particularly hard. Reduced petroleum revenues have made it more difficult for the Kingdom to work off the deficits accrued in financing the 1990-91 Persian Gulf War and have led to speculation that the Riyal might be devalued. In his annual budget statement on January 1, 1994, King Fahd stated his support for the currency and announced a 19 percent cut in government expenditures--stemming, at least for now, some of the concerns about the Saudi Arabian economy.

Low oil prices have not slowed Saudi Arabia's efforts to boost oil production capacity to a targeted 10 million bbl/d (crude only), primarily because most projects are in advanced stages of development. (In the first quarter of 1994, crude production capacity is

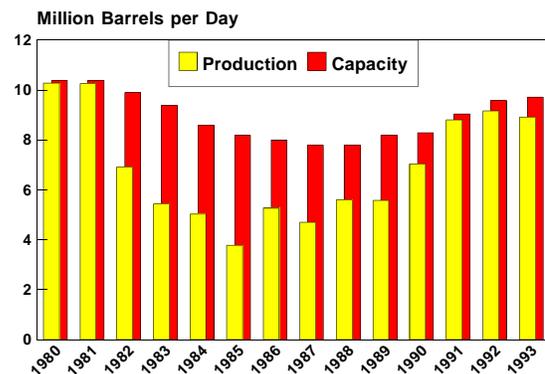
estimated at 9.2 million bbl/d) Saudi Arabia is also continuing with plans to expand its tanker fleet by 15 very large crude carriers (VLCCs) or ultra large crude carriers (ULCCs). The first new tanker was delivered in October 1993, and all but one of the new tankers is scheduled for delivery by the end of 1994.

In June 1993, Saudi Arabian Marketing and Refining (SAMAREC) was merged into Saudi Aramco. SAMAREC had operated six refineries (three domestically oriented and three for exports), the Kingdom's product distribution network, and international marketing for refined products. SAMAREC's plan for a \$4 billion refinery upgrading program is being reviewed by Saudi Aramco. Separately, the Kingdom is also reviewing its petrochemical policy, particularly with respect to the participation of Saudi Aramco.

Saudi Arabia continues to pursue downstream investments with foreign partners that will ensure future markets for its crude production. In December 1993, Saudi Aramco was selected as the winning bid for a 40% stake in Petron, a Philippines refiner/marketer. This followed the termination of negotiations for a joint venture refining deal with a consortium of Japanese companies which abandoned the effort in November 1993 due to economic conditions and petroleum demand projections.

In August 1993, Saudi Arabia sent warning letters to international oil companies exploring in disputed areas of northern Yemen (similar letters had also been

## **Total Liquids Production\* and Capacity**



\*Includes 1/2 Neutral Zone

sent in March 1992). Following mediation by France, whose companies operate in the disputed area, Saudi Arabia and Yemen began talks aimed at resolving the border dispute.

The Majlis al-Shura (or Consultative Council), which was established as part of a political reform effort begun in 1992, met for the first time in January 1994. Although the reform measures are modest by Western standards (Shura members were appointed by King Fahd), they are nevertheless the most profound in Saudi Arabia's history.

## **OIL**

Most of Saudi Arabia's oil is produced on behalf of the Saudi Government by the Saudi Arabian Oil Company (Saudi Aramco). Most current production comes from the giant onshore Ghawar field, the largest oil-producing field in the world. Saudi Arabia also operates the largest offshore field in the world--Safaniya. Based on 1992 production levels, about 57% of production is Arab Light (primarily from Ghawar), 17% is Arab Heavy (primarily from Safaniya), 17% is Arab Medium (primarily from the Zuluf field) and 10% is Extra Light (primarily from the Berri field). Saudi Arabia also shares production from the Neutral Zone with Kuwait.

Saudi Arabia's main processing center for crude oil is located at Abqaiq. Saudi Arabia's oil terminals on the Persian Gulf and Red Sea are estimated to have the capacity to handle up to 14 million bbl/d. During 1993, the capacity of the Kingdom's main export pipeline--the East-West Pipeline (or Petroline)--was expanded from 3.2 million bbl/d to 5.0 million bbl/d. Other pipelines transport natural gas liquids (NGLs) from Abqaiq to Yanbu and crude oil from Abqaiq to a refinery in Bahrain.

To reach and maintain its capacity goal of 10 million bbl/d, Saudi Arabia is focusing on developing, expanding, or upgrading its existing reserves. During 1993, projects expanding capacity at two offshore fields (Marjan and Zuluf) added about 1.2 million bbl/d. Meanwhile, several smaller fields were shut down to achieve economies of scale. Planned additions in 1994 will add up to 1 million bbl/d from work at the offshore Safaniya field and five onshore fields (Hawiyah, Abqaiq, Hawtah, Hazmiyah, and

Ghinah). Onshore development is concentrated on light reserves, including Super Light crude from fields south of Riyadh. During 1993, tenders were issued for the development of the Haradh field (southern Ghawar), scheduled to be brought on-line in 1995. Development of the Shaybah field, located near the United Arab Emirates border at a distance from existing infrastructure, has been slowed because of the current investment environment.

Financial considerations have also affected Saudi Arabia's exploration efforts, which have resumed at a modest pace over the past several years. Recent efforts have had two main results: 1) Identifying the first onshore field (Midyan) in the northwest corner of Saudi Arabia along the Red Sea; and 2) finding several fields in the Central Area south of Riyadh that produce an extremely light and sweet crude (some wells tested over 50 degrees API gravity).

Saudi Arabia is an important source of oil for the United States, Europe, and Japan. Since 1988, it has been the largest single source of oil imports for the United States, providing 17 percent of gross imports in the first 11 months of 1993. To better serve its overseas markets, Saudi Arabia maintains stocks near consuming markets in the Caribbean, Northwest Europe, and the Mediterranean. In 1992, it owned or leased an estimated 20-25 million barrels of storage capacity in these areas. In August 1993, it acquired a share of Texaco's terminal in Rotterdam, which added 6 million barrels of owned storage space. In December 1993, it signed a long-term lease for 5 million barrels of storage to be constructed by early 1995 at Statia Terminals on St. Eustatius in the Caribbean.

## **REFINING**

Prior to its merger into Saudi Aramco in June 1993, SAMAREC had planned to upgrade all its domestic and export refineries at an initial estimated cost of \$4 billion. The entire project, which is expected to take 10 years, has been put on hold while Saudi Aramco reviews the plans. A \$1 billion upgrade of the Ras Tanura refinery (which was already under Aramco's control prior to the merger) is proceeding, with work expected to begin shortly.

The vertical integration within Saudi Arabia's oil

industry by the merger of SAMAREC into Saudi Aramco complements a series of joint ventures by which Saudi Arabia has acquired overseas refining capacity and market outlets. Its first venture - Star Enterprise of Houston - was formed as a 50-percent joint venture with Texaco in 1988. Star Enterprise controls Texaco's U.S. refining and marketing in 23 southern and eastern states and has contracts to buy up to 600,000 bbl/d of Saudi crude oil for processing at its three refineries. In 1991, Saudi Arabia entered into another joint venture - this time with the South Korean company Ssangyong. Saudi Arabia holds a

35 percent share of the company and a crude supply contract for up to 300,000 bbl/d for processing at its two refineries. Once a final agreement is reached on Saudi Aramco's bid for a share of Petron, Saudi Arabia will gain access to 40% of a growing market in the Philippines.

Saudi Arabia has also invested in capacity to produce gasoline additives, primarily methyl tertiary butyl ether (MTBE). A new MTBE plant started operating in Jubail in November 1993, bringing total MTBE production capacity to 1.3 million tons/year. An affiliate of Saudi Basic Industries Corp. (SABIC) controls nearly all of this capacity. The only other operating facility is a 100,000 ton/year plant at the Yanbu/Mobil refinery. In August 1993, Saudi Arabia rejected Mobil's plan for an \$800 million joint venture with Saudi private interests to construct another MTBE plant at Yanbu

### **NATURAL GAS**

Saudi Arabia produces natural gas exclusively for domestic consumption. Prior to 1982, when the Kingdom's Master Gas System (MGS) began operation, most of the natural gas associated with oil production had been flared. The MGS has a capacity to gather about 6 billion cubic feet/day (Bcf/d) and process about 4 Bcf/d. Some associated gas continues to be flared because gathering facilities have not been expanded to transport all associated gas to the MGS. During the mid-1980's, when petroleum production fell below 6 million bbl/d, Saudi Arabia began an exploration program for non-associated gas as well.

# South Korea

## COUNTRY OVERVIEW

**President:** Kim Young-Sam

**Population (1994E):** 44.5 million

**Location/Size:** Eastern Asia/98,480 sq km (38,013 sq mi), about the size of Indiana

**Language:** Korean

**Religion:** Confucian, Christian, Buddhist

**Ethnic Divisions:** homogeneous; small Chinese minority

**Defense:** Army (650,000); Navy (60,000); Air Force (40,000); U.S. Troops (around 37,000)

**Major Cities:** Seoul (capital), Pusan, Taegu, Incheon

**Major Import Products:** Machinery, electronics, oil, steel, transport equipment, textiles, organic chemicals, grains

**Major Export Products:** Electronics and electrical equipment, machinery, steel, automobiles, textiles, clothing

**Major Trading Partners:** United States, Japan, Hong Kong, Germany, China

## ECONOMIC OVERVIEW

**Gross Domestic Product (1994E):** \$424 billion

**Monetary Reserves (Non-Gold, 1993):** \$19.3 billion

**Currency:** Won

**Exchange Rate (4/94):** US\$1 = 809 Won

**Current Account Balance (1994E):** \$250 million

**External Debt (1994E):** \$38 billion

## ENERGY OVERVIEW

**Trade, Industry, and Energy Minister:** Kim Chul-Su

**Proven Oil Reserves (1/1/94):** None

**Petroleum Consumption (1993):** 1.6 million barrels per day (bbl/d)

**Refining Capacity (1/28/94):** 1.5 million bbl/d

**Petroleum Imports (1993):** 1.6 million bbl/d

**Natural Gas Consumption (1992):** 174 billion cubic feet

**Coal Consumption (1992):** 49 million short tons (MMST)

**Coal Production (1992):** 13 MMST

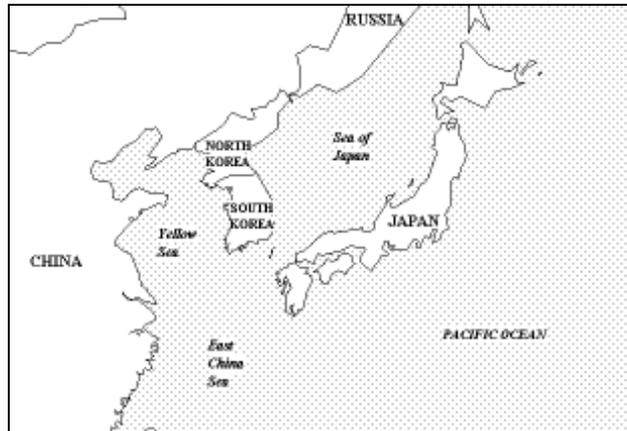
**Hydroelectric Consumption (1992):** 4.8 billion kilowatthours (kWh)

**Nuclear Electric Consumption (1992):** 54 billion kWh

## OIL INDUSTRY

**Major Companies:** *Yukong Ltd.* (est. 1962) - Oil exploration and production, petroleum refining and marketing, lubricants, energy source diversification, petrochemicals; *Honam Oil Refinery Co., Ltd.* (joint venture between Lucky Ltd. and Caltex USA, est. 1967) - Refining,

petrochemicals, alternative energy sources, pipelines; *Kyung-In Energy Co., Ltd.* (est. 1969) - Refining, oil exploration, petrochemicals; *Ssangyong Oil Refining Co., Ltd.* (est. 1976) - Refining, lubricants, petrochemicals; *Han-Saudi Oil Refining Co.* (est. 1991) - joint venture between Ssangyong and Saudi Aramco; *Hyundai Oil Refinery Co., Ltd.* - Refining, lubricants; *Korea Petroleum Development Co.* (state-run, est. 1979) - Oil exploration



and development, oil stockpiling, management, investment and finance

**Major Refineries (Capacity):** Ulsan (529,000 bbl/d); Yocheon (342,000 bbl/d); Onsan (300,000 bbl/d)

**Major Ports:** Pusan, Incheon, Kunsan, Mokpo, Ulsan

**Major Customers:** U.S., Japan, Hong Kong, Germany, China

## GENERAL BACKGROUND

At the Potsdam Conference in July 1945, Korea was divided along the 38th parallel, with Russian troops in the North and U.S. troops in the South. South Korea was granted formal independence as a separate state on August 15, 1948. The Korean War from 1950-1953 cemented the division between the two Koreas, as well as the U.S. presence in the South.

On July 1, 1987, President Chun Doo Hwan agreed to direct popular vote and other constitutional reforms. In December 1987, Roh Tae Woo (the ruling party candidate) was elected President. In December 1992, Kim Young-Sam, the candidate of the ruling Democratic Liberal Party, was elected president. As part of a move towards closer regional economic and political cooperation, South Korea established diplomatic ties with China (August 1992) and the Soviet Union (1990).

The South Korean economy is forecasted to grow at a rate of 6.3 percent in 1994 (compared to 4.9 percent in 1993). The economy will be helped by a continued solid increase in exports and improved capital and private spending. In 1993, exports rose by 7.8 percent to \$81 billion, with large increases in the heavy and petrochemical industry products. For example, exports of automobiles increased by 54 percent, steel products increased by 23 percent, machinery increased by 15 percent, and petrochemicals increased by 9.7 percent. Capital investment, boosted by active investments in the automobile, electronics, and shipbuilding sectors, is also seen growing at a rate of 5.8 percent in 1994.

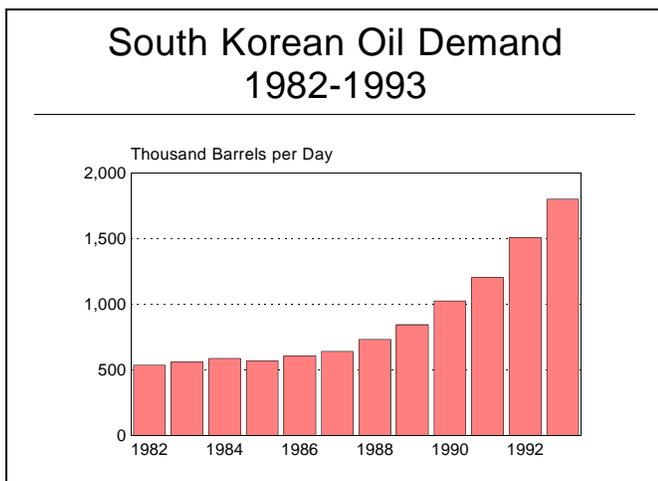
In March 1994, tension mounted in the divided Korean peninsula after North Korea denied the International Atomic Energy Agency inspectors access to nuclear sites. The United States subsequently agreed to deploy Patriot missiles in South Korea as a defense against the 1.1 million troops of the North. Also, the United States and South Korea are scheduled to resume their joint military exercise (dubbed 'Team Spirit') sometime this fall.

President Kim's term of office in 1998.

In January 1994, South Korea announced that it would more than double its strategic crude oil stockpile, reflecting a need to keep pace with the rising demand of recent years (see graph). The stockpile is to be expanded from 40 million barrels to 87 million barrels between January 1994 and the end of 1998. In order to accommodate the extra 47 million barrels that are to be bought over the next five years, the government plans to build up to seven storage tanks at a cost of about \$800 million.

**OIL**

As one of the 4 Asian economic "tigers," South Korea has experienced rapid economic growth in recent years, resulting in a parallel growth in energy demand. Oil, which supplies roughly two-thirds of



South Korea is developing a five-year, \$8.65 billion privatization program which will open domestic industries to foreign investment in order to increase investment and encourage technology transfer to its domestic industries. About seventy state-owned or state-invested companies are scheduled to be privatized between March 1994 and the end of

the country's primary energy requirements, has accounted for much of this growth. Oil consumption rose by over 19 percent in 1993, after increases of 20 percent or more in 1991 and 1992.

Since South Korea produces no oil, the country is totally reliant on energy imports. More than 70 percent of these come from the Middle East, with the rest supplied primarily by southeast Asian countries. Early in 1993, the South Korean government decided to provide domestic oil companies with \$8.4 million in concessionary loans to help their efforts to diversify import sources. Despite the government's efforts, South Korea still relies heavily on Middle Eastern countries for oil supplies.

received its first cargo of another 56,000 tons of LNG from Brunei in March 1994. Previously, all of South Korea's LNG imports came from Indonesia, Malaysia, and Australia.

### **REFINING**

Crude distillation capacity is projected to increase more than 800,000 barrels per day (bbl/d) by 1997 from a current level of 1.5 million bbl/d. Some of the increased capacity will be in the form of upgrading units but the majority will be for crude distillation. The largest increase in refinery output is planned for *Honam's* Yocheon refinery, which will expand by 247,000 bbl/d (from 342,000 bbl/d to 589,000 bbl/d). Three other refineries, *Hyundai's* Daesan, *Ssangyong's* Onsan, and *Yukong's* Ulsan, are expected to increase refining capacity output by 180,000 bbl/d in 1997.

### **NATURAL GAS**

In 1993 and continuing into 1994, South Korea ventured into several contracts to import liquefied natural gas (LNG). In June 1993, South Korea signed an agreement with Indonesia to import 2 million tons of LNG every year for the next 20 years, starting in 1995. This long-term contract will ensure a steady supply of LNG, for which demand expected to rise from 4.25 million tons in 1993 to over 8 million tons in 1997.

In October 1993, South Korea agreed to receive its first shipment of 56,000 tons of LNG from Australia's North West Shelf project. South Korea is expected to buy 8-10 more shipments from December 1994 to June 1995. Korea Gas Corporation (KGC) hopes to import about 1.2 million tons from Australia from June 1995 to the end of the decade. Also, KGC

# Syria

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**Major Foreign Oil Company Involvement:** Royal Dutch/Shell; Deminex; Elf-Aquitaine; Occidental; and Unocal

## COUNTRY OVERVIEW

**Head of State:** Hafiz al-Asad

**Population (1994):** 15 million

**Location/Size:** Western Asia/185,180 sq km (71,498 sq mi), slightly larger than North Dakota

**Language:** Arabic (official); Kurdish

**Religion:** Sunni Muslim (74%); Alawite, Druze, and other Muslim sects (16%); Christian (10%)

**Ethnic Divisions:** Arab 90.3%, Kurds, Armenians and others 9.7%

**Defense:** Army (300,000); Air Defense Command (60,000); Navy (6,000); Air Force (40,000)

**Major Cities:** Damascus, Aleppo, Homs

**Major Import Products:** Foodstuffs and beverages, machinery, metal and metal products, textiles

**Major Export Products:** Petroleum, farm products, textiles, phosphates

## ECONOMIC OVERVIEW

**Gross Domestic Product (GDP) (1992):** \$81.7 billion

**Real GDP Growth Rate (1993):** 10 percent

**Exports (1992):** \$3.1 billion

**Imports (1992):** \$2.9 billion

**External Debt (1992):** \$16.5 billion

## ENERGY OVERVIEW

**Oil Minister:** Nader al-Nabulsi

**Proven Oil Reserves (1/1/94):** 1.7 billion barrels

**Oil Production (2Q94):** 570,000 barrels per day (bbl/d)

**Oil Production Capacity (9/94E):** 600,000 bbl/d

**Domestic Oil Consumption (2Q94E):** 225,000 bbl/d

**Refining Capacity (1/1/94):** 242,000 bbl/d

**Net Oil Exports (2Q94E):** 345,000 bbl/d

**Natural Gas Reserves (1/1/94):** 7 trillion cubic feet

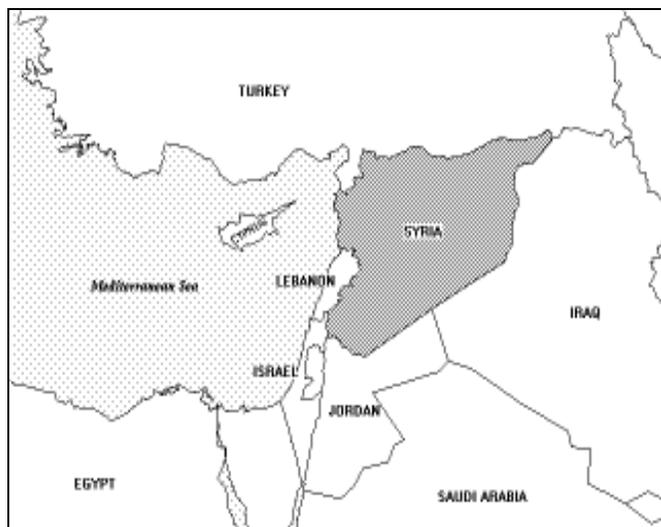
**Natural Gas Production (1994E):** 90 billion cubic feet

**Major Ports:** Latakia, Baniyas, Tartus

**Major Oil Fields:** Omar, Jubaisah, Suwaidiyah, Thayyem, Karatchok

## OIL INDUSTRY

**Organization:** The state-owned Syrian General Petroleum Company is divided into five individual companies: the Syrian Petroleum Company (SPC) is responsible for exploration and development of Syria's oil resources; the Syrian Company for Oil Transport (SCOT) operates the country's domestic pipelines; the Syrian Company for Storage and Distribution of Petroleum Products (Sadcop) is in charge of marketing and distribution of oil within Syria; and the country's two refineries are run by the Homs Refinery Company and Baniyas Oil Refining Company.



liberalization policy begun in the late 1980's, which has begun to open up the economy after decades of state control; 2) increased oil export revenues; and 3) contributions from Arab Gulf states as a reward for Syrian participation in the Desert Storm coalition. In addition, Russia reportedly agreed in June to write off most of Syria's \$10 billion in military debt to the former Soviet Union. Overall, the Syrian economy has grown by 7% to 8% annually since 1990.

Syria's relations with the United States have also improved in recent years, particularly since the collapse of the Soviet Union (Syria's major ally) in late 1991. One sign of this improvement was the January 16, 1994, meeting between Syrian President Asad and U.S. President Clinton in Geneva. At this meeting, the two sides discussed bilateral relations, as well as the Middle East peace process.

Partly as a result of the end of the Cold War, prospects for a comprehensive Middle East peace settlement between Israel and its Arab neighbors are greater now than possibly any other time in history, with Syria the key remaining holdout. Major issues which need to be resolved between Israel and Syria include: a timetable for Israeli withdrawal from the Golan Heights (occupied since the 1967 Six-Day War); interim security arrangements and guarantees; and a schedule for conclusion of a peace treaty between the two countries.

## **OIL**

Syria's oil output has increased dramatically over the past decade, from 170,000 bbl/d in 1984 to nearly 600,000 bbl/d currently, particularly with the discovery and development of the Thayyam oil field near Deir ez-Zor in eastern Syria in the mid-1980s. Syria's oil exports now account for more than half of the country's foreign exchange earnings. Two-thirds of Syria's oil production is accounted for by Al-Furat Petroleum Company, a joint venture between Syrian Petroleum Company (SPC) and foreign partners Deminex (Germany) and Royal Dutch/Shell. Al-Furat produces primarily light crude, with its major producing fields including al-Thayyem, Omar, Maleh, Tanak, Sijan, al-Isba, and al-Ward. Other major Syrian oil producers include the Syrian Petroleum Company (SPC), which produces 150,000 bbl/d of mainly sour, heavy crude, and Deir ez-Zor Petroleum Company (a 50/50 joint venture between Elf Aquitaine and SPC), which produces 25,000 bbl/d of light crude.

After several years of rapid increases, Syrian oil production now appears to be levelling off, as many older fields have neared maturity while exploration results in recent years have been generally disappointing. Several foreign oil companies, including British Petroleum, Enron, Arco, Total, Marathon, Repsol, and Neste, have ceased activities in Syria in recent years due to poor exploration results and dissatisfaction with contract terms.

## **REFINING**

Syria's two refineries are located at Homs and Banias. Total current production from these refineries is about 225,000 bbl/d, about half of which is fuel oil. Plans exist to upgrade both refineries in order to increase their production of light products, and to reduce their production of heavy products, particularly fuel oil, which Syria is attempting to replace with natural gas in power generation.

## **NATURAL GAS**

Syria currently produces around 90 billion cubic feet of natural gas per year, a nine-fold increase over production during the past decade. Syria's current energy strategy relies heavily on the substitution of

natural gas for oil in power generation in order to free up as much oil as possible for export. Plans call for the installation in coming years of gas pipelines serving new and existing power plants at Jandar, al-Nasiriyah, and Tishrin.

Overall, Syria's natural gas production is expected to more than double in 1995, to over 200 billion cubic feet per year. A key geographical problem confronting the country's natural gas industry is that gas reserves are located mainly in eastern Syria, while population is centered in western and southern Syria.

### **ELECTRIC POWER**

In June 1993, President Asad dismissed his Electricity Minister, Kamel al-Baba, amid growing criticism of the government's failure to solve Syria's chronic electricity shortages. These shortages have been caused by reduced supplies of hydroelectric power, delays in construction of new power plants, and increased electricity consumption.

In September 1993, President Asad declared that a secure supply of electricity was the right of every Syrian. Following this declaration, contracts were awarded for the construction of several new gas turbine power stations. These plants will begin coming on line in late 1994, starting with a 600-MW station being built by Japan's Mitsubishi Heavy Industries at Jandar, near Homs. In addition, eight 125-MW gas turbine plants are being constructed throughout the country by Italy's FiatAvio, and a 630-MW hydroelectric plant is being built by Sichuan Machinery of China at the Tishreen dam on the Euphrates River. Finally, the Saudi Fund for Development has agreed to provide \$200 million in funding towards construction of a 1000-MW steam power plant to be built near Aleppo in northwest Syria.

## **Ukraine**

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### **COUNTRY OVERVIEW**

**President:** Leonid Kuchma  
**Prime Minister:** Vitaly Masol  
**Independence:** December 1, 1991 (from Soviet Union)  
**Population (7/94E):** 52 million  
**Location/Size:** Western edge of former Soviet Union/603,700 sq km (233,090 sq mi), slightly smaller than Texas  
**Major Cities:** Kiev, L'vov, Odessa, Kharkiv, Donetsk  
**Languages:** Ukrainian, Russian, Romanian, Polish, Hungarian  
**Ethnic Groups (1994):** Ukrainian (73%), Russian (22%)  
**Religions:** Ukrainian Orthodox, Ukrainian Catholic  
**Defense (1992):** Army (217,000), Air Force (171,000), Navy (3,000), Paramilitary forces (72,000)

### **ECONOMIC OVERVIEW**

**Currency:** Karbovanet  
**Official Exchange Rate (7/94):** \$1 = 35,000 karbovanets  
**Gross Domestic Product (GDP) (1993E):** \$205.4 billion  
**Real GDP Growth Rate (1993E):** -16%  
**Inflation Rate (1993E):** 45% per month  
**Trade Balance (1993E):** \$1 billion  
**Merchandise Exports (to outside FSU) (1993):** \$3 billion  
**Merchandise Imports (from outside FSU) (1993):** \$2.2 billion  
**Major Export Products:** Coal, electric power, metals, chemicals, machinery, grain  
**Major Import Products:** Oil, gas, transportation equipment, machinery and parts, textiles, chemicals  
**Major Trading Partners:** Russia, Belarus, Moldova, China, Turkmenistan, Poland, Bulgaria, Romania, Germany  
**Total External Debt (1992):** \$415.3 million

### **ENERGY OVERVIEW**

**Energy Minister:** Anatoli Grishenko  
**Proven Oil Reserves (1993E):** 595 million barrels  
**Oil Production (1993):** 88,000 barrels per day (bbl/d)  
**Oil Production Capacity (1994E):** 90,000 bbl/d  
**Oil Consumption (1993E):** 680,000 bbl/d  
**Crude Refining Capacity (1/1/94):** 1,237,000 bbl/d  
**Net Oil Imports (1993E):** 590,000 bbl/d  
**Major Oil Suppliers:** Russia, Iran, Bulgaria, Romania  
**Natural Gas Reserves (1992E):** 35 trillion cubic feet (Tcf)  
**Natural Gas Production (1993):** 0.59 Tcf  
**Natural Gas Imports (1993):** 3.4 Tcf  
**Coal Production (1993):** 115.7 million short tons (mmst)  
**Coal Consumption (1993):** 117.1 mmst  
**Electricity Generation Capacity (1993):** 55.9 gigawatts  
**Electricity Production (1993):** 281 terawatthours

### **ENVIRONMENT OVERVIEW**



**Total Energy Consumption (1992):** 8.75 quadrillion Btu  
**Energy Consumption per Dollar of GDP (1992):** 43,000 Btu

**Energy Consumption per Capita (1992):** 17 million Btu

**Energy-related Carbon Emissions (1992):** 152 million metric tons

**Carbon Emissions per Thousand Dollars of GDP (1992):** 0.74 metric tons

**Carbon Emissions per Capita (1992):** 2.9 metric tons

**Major Environmental Problems:** Radiation contamination from the 1986 Chernobyl accident, acid rain, greenhouse gas emissions

## **OIL and GAS INDUSTRIES**

**Organization:** Ukrneft (national oil company and umbrella organization for other state-owned oil enterprises); Chernomorneftegaz (offshore production association); Ukrneftegaz (state oil and gas production company)

**Major Oil Fields:** Poltava-Province/Dnepro-Donetsk Basin, West Ukrainian/Carpathian Fields, Crimea

**Major Oil Ports (1992 export volumes):** Odessa (245,000 bbl/d), Sevastopol (3,000 bbl/d), Feodosiya (20,000 bbl/d)

**Oil Export Pipelines Crossing Ukraine:** Friendship (Druzhba) (1 million bbl/d), Eastern Products (30,000 bbl/d)

**Major Oil Refineries (1991 throughput):** Lisichansk (460,000 bbl/d), Kremenchug (300,000 bbl/d), Kherson (120,000 bbl/d)

**Major Foreign Oil Company Involvement:** Elf Aquitaine, Gaz de France, Total, HyTEXplor Houston, JP Kenny

**Major Gas Fields:** Poltava Province/Dnepro-Donetsk Basin, West Ukrainian/Carpathian Fields, Arkhangelskoye (NW Crimea) Field, and Sea of Azov

**Gas Export Pipelines Crossing Ukraine (Capacity):** Urengoi (1 Tcf), Northern Lights (0.8 Tcf), Progress (1

Tcf), Shebelinka (0.7 Tcf), Soyuz (1 Tcf), West Ukraine (0.15 Tcf)

**Major Coal Fields:** Donets Basin (Donbas), L'viv-Volhynian (West Ukraine), Dnieper (lignite basin)

**Major Coal Customers:** Russia, Belarus, Moldova, Eastern Europe

**Nuclear Power Plants (Capacity):** Chernobyl (2225 MW), Khmel'nitskiy (950 MW), Rovno (1695 MW), South Ukraine (2850 MW), Zaporozh'ye (4750 MW)

## **GENERAL BACKGROUND**

Ukraine's economic situation deteriorated during 1993 after reforms initiated by President Kravchuk in late 1992 were not fully implemented by the Supreme Council. This failure resulted in a 10,000 percent increase in consumer prices in 1993, a distorted fiscal policy in which 1993 government spending reached 90 percent of gross domestic product and a roughly 34 percent drop in gross national product for the first half of 1994.

In July 1994, Leonid Kuchma defeated incumbent President Leonid Kravchuk by a narrow margin in a run-off election. Shortly after his election, Kuchma issued decrees which centralized his power and augmented his ability to pass economic reforms. In October 1994, Kuchma was able to pass Ukraine's first fully-supported reform package since its independence. The reforms are intended to reduce state subsidies, free prices, rewrite the tax system, and begin privatization.

Kuchma's reform package is the prerequisite for receiving a \$4 billion aid package from the Group of Seven (G-7) and \$730 million from the IMF. Additionally, the United States has offered Ukraine \$700 million, of which half is allocated for speeding Ukraine's nuclear disarmament. In early 1994, Ukraine signed a tri-lateral nuclear disarmament treaty with the United States and Russia and ratified START I unconditionally. As of November 1994, the Supreme Council was reviewing the Nuclear Non-Proliferation Treaty.

In January 1994, Crimea's ethnically-Russian majority elected separatist Yuri Meshkov as president. Meshkov subsequently approved a new constitution which proclaimed Crimea's "equal status" with Ukraine. Ukraine viewed this as equivalent to a declaration of independence and ordered Crimea to

annul the new constitution by November 1994. Crimean lawmakers failed to meet this deadline during a vote in early November 1994. Political tensions also rose within Crimea in late 1994 when Meshkov locked lawmakers out of the parliament building because of perceived policy differences. In addition, the Ukrainian-Russian conflict over ownership of the Black Sea fleet continued after a military incident in March 1994.

## **OIL**

Ukrainian oil production has declined since the 1970s and fallen about eight percent in both 1993 and 1994, respectively. In 1993, domestic production met only 88,000 barrels per day (bbl/d) of Ukraine's consumption requirements of 680,000 bbl/d. To alleviate this shortfall, Ukraine traditionally has imported large quantities of Russian oil, mainly from Siberia. Since Russia reduced subsidies on its oil exports, Ukraine gradually accumulated a large debt for Russian energy supplies, which reached \$1.5 billion in October 1994. Consequently, Russia began to limit oil and gas shipments to Ukraine during 1994.

In order to end its reliance on Russian oil, Ukraine has implemented a national energy program called "Oil Ukraine 2000." In 1993, plans were made to develop oil and gas resources in the Black Sea, and one of Oil Ukraine 2000's major projects is the proposed construction of a \$2.5 billion, 800,000 bbl/d oil terminal near Odessa. This terminal would receive Bulgarian, Romanian, Turkish, and Middle Eastern oil imports through the Black Sea and would bypass Russian supply routes. However, construction plans are meeting resistance from environmentalists and city officials who argue that Ukraine does not have the need nor the means to build such a large installation.

The controversy surrounding the Odessa terminal as well as the present necessity of importing Russian oil has delayed any Ukrainian efforts to diversify its sources of oil imports. In July 1994, Ukraine agreed to send 1,500 technical advisors to Iraq in exchange for up to 100,000 bbl/d of Iraqi crude oil. This plan cannot proceed further, though, until the U.N. sanctions against Iraq are lifted. Also, in mid-1994, Ukraine gave Russia a 30 percent stake in Ukrneftgaz as a partial payment for its energy debt.

In October 1994, Ukraine and Russia negotiated a friendship treaty which will increase Russian oil exports to Ukraine to 400,000 bbl/d.

## **Pipelines**

Ukraine is a key transit route for Russian oil and gas exports to Europe. The Druzhba (Friendship) oil pipeline has a capacity of one million bbl/d. Also, over 90 percent of all Russian gas exports to Europe pass through Ukraine. Russian export routes through Ukraine to European markets have provided the opportunity for Ukraine to siphon off gas destined for Europe in order to meet its own energy needs. While the Ukrainian government denies that this has taken place, Russia developed plans in 1994 to by-pass Ukraine by increasing gas exports to Europe through Poland and Belarus.

## **REFINING**

Ukraine has the second largest potential refinery throughput in the former Soviet Union (FSU), with a total capacity of 1.24 million bbl/d. However, capacity utilization during 1993 was only 34 percent. Most of Ukraine's seven refineries date from before World War II. In December 1993, Ukraine adopted a plan which would either modernize refineries that were economically viable or close or reduce operations in others, such as the Odessa and Drobych refineries.

Ukraine's two largest refineries are Lisichansk and Kremenchug, with capacities of 420,000 bbl/d and 315,000 bbl/d, respectively. While Lisichansk is the newest and largest refinery, it cannot process high sulfur grade crude oils. Kremenchug, which is the most sophisticated, contains all of Ukraine's cracking capacity, half of its hydro-treating capacity, and 35 percent of its reforming capacity. It is used to process heavier Russian crudes from Bashkiria and Tartarstan.

## **NATURAL GAS**

Ukraine experienced severe energy shortages in 1993 and 1994. Russia and Turkmenistan halted or reduced gas supplies several times because of Ukraine's inability to pay for its energy imports. In August 1994, Ukraine agreed to a payment deal which involved selling a stake in its gas enterprises to Russia's Gazprom, but Ukraine continues to oppose Russian ownership of Ukrainian gas pipelines. After

Turkmenistan halted gas deliveries in February 1994, Russia agreed to compensate for the loss by increasing its gas shipments to Ukraine. However, by October 1994, Russian gas supply to Ukraine was 20 percent of normal levels because Ukraine again had fallen behind in payments. A debt repayment schedule with Turkmenistan was arranged in September 1994, and Ukraine contracted to pay \$550 million of its \$700 million debt by the end of 1994. Since Ukraine lacks substantial hard currency reserves, the balance will be paid through a partial barter arrangement with food and industrial products.

### **COAL**

Coal was the source of just under 30 percent of Ukraine's energy requirements in 1993. Ukrainian coal production fell 13 percent and experienced its seventh consecutive yearly decline in 1993. Most of Ukraine's coal mines have passed their peaks and the remaining exploitable seams are deep, inaccessible, and expensive to mine. The coal industry, which employs one million workers, is highly politicized and has relied heavily on high government subsidies in the past. In 1993, the industry covered only 20 percent of its costs, with the remaining 80 percent paid for by the government. These subsidies were reduced in 1994 to cover only 40 percent of the industry's expenses, but even at this

level, the government still injected funds at an annual rate of \$600 million per year. To reduce the cost associated with using coal as an energy source, Ukraine signed a long-term barter contract with Poland in mid-1994. Under the contract, Poland will supply 4.4 million tons of Bogdanka coking coal in exchange for Ukrainian iron ore and semi-smelted iron products.

### **ELECTRIC/NUCLEAR POWER**

While Ukraine has exported electricity to the FSU and former Eastern European countries in the past, these exports have decreased in the last several years because of problems in obtaining fuel and equipment. Chernobyl, Ukraine's largest nuclear power plant, typically supplies seven percent of Ukraine's electrical needs. Since the 1986 accident in which unit 4 of the reactor released massive amounts of radiation, clean-up and maintenance costs have consumed 15 percent of the Ukrainian government's annual budget. In addition, approximately 2.7 million residents claim "victim" status because of the disaster and receive substantial benefits from the government.

In October 1994, Ukraine accepted an international proposal to close Chernobyl. The Ukrainian government originally requested \$14 billion to accomplish this and to find alternative energy sources. In July 1994, the G-7 countries pledged \$800 million toward closing the plant. The G-7 also estimated total costs of between \$1.3 to \$1.8 billion to shut down units 1 and 3, as well as to build an additional sarcophagus around unit 4 (unit 2 was damaged seriously after a 1991 fire).

Closure of units 1 and 2 likely will be preceded by completion of the Zaporozhe-6 nuclear reactor, which will serve as a replacement. As of mid-1994, this new reactor was 95 percent finished. Under the current timetable, the completion of the Rovno and Khelnitski reactors, which are both 70 percent finished, will allow closure of unit 3 by 1996. Financing still remains an issue as of October 1994, but current Ukrainian demands are now in-line with Western estimates of \$1.4 billion without the costs of an additional shelter for unit 4.

# United Arab Emirates

## COUNTRY OVERVIEW

**President (and Ruler of Abu Dhabi):** Zayid bin Sultan al-Nahayan

**Population (1993E):** 3 million

**Location/Size:** Persian Gulf/83,600 sq km (32,300 sq mi), approximately the size of Maine.

**Language:** Arabic, Farsi; English is language of commerce

**Defense:** Army: 40,000; Air Force: 1,500; Navy: 1,500

**Religion:** Muslim, mainly Sunni

**Emirates:** Abu Dhabi, Ajman, Dubai, Fujairah, Ra's al-Khaimah, Sharjah, Umm al-Qaiwain,

## ECONOMIC OVERVIEW

**Monetary Reserves (Non Gold, 10/93 US):** \$5.6 billion

**Gross Domestic Product (1993E):** \$63.8 billion

**Currency:** Dirham (D)

**Exchange Rate (1/94):** US \$1 = D3.67

**Current Account Balance (1993E):** \$2.8 billion

**Import Products:** Industrial goods (28%), machinery (23%), consumer goods (17%), food products (10%)

**Petroleum Export Revenues (1993E):** \$11.4 billion

**Petroleum Export Revenues/Total Export Revenues:** 58%

## ENERGY OVERVIEW

**Petroleum and Mineral Resources Minister (acting Feb. 1994):** Youssef Umair bin Youssef

**Oil Production Capacity (1/1/94):** 2.9 million bbl/d

**Proven Oil Reserves (1/1/94):** 98.1 billion barrels

**Oil Production (1993E):** 2.4 million barrels per day (bbl/d) of which 2.2 million bbl/d is crude.

**OPEC Quota (1Q94):** 2.161 million bbl/d (crude only)

**Domestic Oil Consumption (1993E):** 330,000 bbl/d

**Petroleum Exports (1993E):** 2.1 million bbl/d, of which 15,000 bbl/d is to the U.S.

**Refining Capacity (1/1/93):** 192,500 bbl/d

**Natural Gas Reserves (1/1/94):** 205 trillion cubic feet (Tcf)

**Natural Gas Production (1993E):** 1.2 Tcf

**Natural Gas Consumption (1993E):** 0.9 Tcf

## OIL AND GAS INDUSTRIES

**Organizations:** Abu Dhabi National Oil Co. (ADNOC), Emirates National Oil Co, Abu Dhabi Co. for Onshore Oil Operations (ADCO), Abu Dhabi Marine Operating Co. (ADMA-OPCO), Dubai Petroleum Co. (DPC), Abu Dhabi Gas Company (Adgas), Dubai Gas Company (Dugas), Emirates Petroleum Products Co. (EPPCO), Emirates General Petroleum Corp. (EGPC), International Petroleum Investment Co. (IPIC)

**Major Refineries:** Ruwais (120,000 bbl/d), Umm al-Nar II (73,000 bbl/d)



**Major Gas Processing Plants:** Bab, Bu Hasa, Das Island, Habshan (2), Jebel Ali, Ruwais

**Major Oil Fields:** *Abu Dhabi:* Asab, Bab, Bu Hasa, Zakum  
*Dubai:* Fallah, Fateh, Southwest Fateh, Rashid

*Sharjah:* Mubarak (at Abu Musa, in dispute with Iran)

**Major Gas Fields:** *Abu Dhabi:* Khuff, Zakum

**Major Ports:** *Abu Dhabi:* Das Island, Delma Island, Jebel as Dhanna, Ruwais, Abu al Bukhush, Al Mubarraz, Zirku Island, Port Zayed, Umm al Nar

*Dubai:* Jebel Ali, Fateh, Port Rashid

*Sharjah:* Mubarak

**Major Trading Partners:** Japan, U.S., U.K., Germany

## OIL

The UAE's biggest market for its crude is the Far East, which accounts for over 80 percent of its crude oil exports. Japan alone imports about 1.2 million bbl/d of UAE crude; approximately 27 percent of its total oil imports come from the Emirates. Japan also imports large amounts of liquefied natural gas from the UAE.

Most of UAE's hydrocarbon reserves are located in Abu Dhabi. With some 92 billion barrels of proven crude oil reserves, Abu Dhabi holds about 94 percent of total UAE reserves. Dubai is second, with 4 billion barrels of proven reserves, followed by Sharjah and Ras al Khaimah, with 1.5 billion and 400 million, respectively.

Abu Dhabi is investing more than \$6 billion over the next few years to raise its oil production by more than 30 percent. Dubai, with a much smaller oil and

gas reserve base, is concentrating its efforts on diversifying its economy as oil production continues to decline. Sharjah, the third largest energy exporting emirate, has finally seen its finances boosted by recent natural gas finds and has invested heavily in manufacturing industries.

Despite a push towards achieving a diverse economy, oil still remains the main source of export revenue for the UAE. However, oil revenues have been falling in recent years because of lower oil prices. In 1993, crude oil export revenues fell to \$11.8 billion from \$13.4 billion in 1992. This followed a 15 percent decline between 1990 and 1992, despite increased UAE oil production.

### **Exploration and Development**

Most of the UAE's expansion activity with regards to oil production is occurring in the emirate of Abu Dhabi, which has the largest oil reserves and production capacity of the seven emirates. Abu Dhabi's oil production capacity is currently about 2.2 million bbl/d, of which 1.05 million bbl/d is located offshore and 1.15 million bbl/d onshore. Oil production capacity is now scheduled to be raised to nearly 2.9 million bbl/d by 1995-1996.

Much of this capacity expansion in Abu Dhabi will come from onshore operator ADCO, which plans to raise output by a third to 1.2 million bbl/d by 1996/97. ADCO has already completed the construction of three new oil storage tanks with the capacity of 1 million barrels each at the Jebel as Dhanah terminal in Abu Dhabi, raising storage capacity at the terminal to over 8.3 million barrels. Jebel as Dhanah opened in 1962 as a service center for oil from the Bab, Bu Hasa, Asab, Sahl and Shah fields.

A major increase in production capacity is planned for the Bab field in central Abu Dhabi, from the current 100,000 bbl/d to 250,000 bbl/d. Overall, the project is expected to cost over \$300 million and should be completed by the end of 1995. Another phase will eventually raise capacity at the field to 350,000 bbl/d. In addition, the capacity at Bu Hasa field is being raised by 100,000 bbl/d to 550,000 bbl/d through gas injection. This upgrade is expected to be completed in 1994 at a cost of \$90 million.

A new field, Jarn Yaphour, came on line in December 1993. The development of the field started in September 1991 and cost \$70 million. The field is pumping 10,000 bbl/d of oil as feedstock for the nearby Umm Al-Nar refinery, plus 60 thousand cubic feet per day (Mcf/d) of natural gas. Zadco is developing production capacity at the offshore lower Zakum field. By the end of 1994 capacity should reach 550,000 bbl/d, up from the present 350,000 bbl/d. The field is believed to have a production potential as high as 750,000 bbl/d. In Dubai, recent offshore exploration activity by DPC in its four fields (Fateh, Southwest Fateh, Rashid and Fallah) has not yielded any major finds.

New investments are also planned for UAE's natural gas liquids (NGL) industry. For example, NGL plants at the Bab and Bu Hasa fields are to be upgraded simultaneously to increase the percentage of liquid yielded.

### **REFINING**

Abu Dhabi is the only emirate with refining capability. The two refineries (Ruweis and Umm al-Nar II) are operated by ADNOC.

A \$100 million first phase expansion at the Ruweis refinery entails raising capacity to 250,000-300,000 bbl/d by 1995. The \$1.2 billion second phase, which has not yet received approval from the Supreme Petroleum Council, would include the addition of visbreaking, catalytic reforming, kerosene processing, and vacuum topping units as well as an upgrade of the current hydrocracker unit.

The Umm-al Nar II refinery replaced the original Umm-al Nar refinery in July 1983. Umm al-Nar II processes crude from the Asab and Sahl structures, which are in the Murban Basin.

In Dubai, plans for a methyl tertiary butyl ether (MTBE) plant at Jebel Ali are progressing slowly, and work on the promised refinery there is presently stalled.

### **NATURAL GAS**

The UAE's natural gas reserves, an estimated 205 Tcf, are the fourth largest in the world, behind

Russia's, Iran's and Qatar's. The UAE has allocated over \$1 billion to expand its natural gas and refining sectors over the next few years.

ADNOC has completed a major component of its natural gas expansion project at the offshore Abu al Bukhush field. The field will now produce 320 million cubic feet per day of gas and up to 10,000 bbl/d of condensates. The gas will be used as feedstock for the third liquefied natural gas (LNG) train on Das Island, which is currently under construction by ADGAS. This train, when completed by mid-1994, will raise Das Island's LNG capacity to 5 million tons per year (mmt/y), as compared to the current 2.5 mmt/y from the existing two trains. Additional feedstock will come from the Umm Shaif field.

Japan's Tokyo Electric Power Co. (Tepco) has been purchasing 2.4 mmt/y of liquefied gas from Das Island and has signed an agreement in November of 1993 to double that amount to 5 mmt/y for 25 years starting in 1994.

The UAE's successful export partnership with Japan has prompted Thailand to consider similar long-term contracts for LNG purchases. As part of Adnoc's ongoing expansion program, a 40 kilometer (25 mi) pipeline from Zarkwa Island is being built to carry over 50 Mcf/d of associated gas to the Das Island treatment plant.

Sharjah has seen considerable hydrocarbon activity recently. In 1992, Amoco Sharjah announced the discovery of an additional 100 Mcf/d of natural gas and 15,000 bbl/d of condensates at its onshore concession areas (Sajaa and Moveyeid fields).

Sharjah-based Crescent Petroleum is completing a \$140 million gas and condensate investment program at the offshore Mubarak field, including the recent installation of a new \$32 million production platform. Mubarak is within the territorial waters of Abu Musa, an island over which Iran also claims sovereignty. However, Crescent says it has not experienced any problems with Iran.

# Venezuela

## COUNTRY OVERVIEW

**President:** Rafael Caldera

**Population(1993E):** 20 million

**Location/ Size:** South America /912,000 sq km (352,050 sq mi), one-third larger than Texas

**Language:** Spanish, Indian dialects in interior

**Defense:** Army: 34,000; Air Force: 5,000; Navy: 10,000

**Religion:** Roman Catholic 96%, Protestant 2%

**Major Cities:** Caracas, Maracaibo, Valencia, Barquisimeto

**Major Import Products:** Capital and consumer goods, and raw materials

## ECONOMIC OVERVIEW

**Monetary Reserves (1993E):** \$9.6 billion

**Gross Foreign Debt (1993E):** \$30.6 billion

**Gross Domestic Product (1993E):** \$161 billion

**GDP per capita (1993E):** \$2,985

**Currency:** Bolivar

**Exchange Rate (4/94):** US \$1 = 115 bolivars

**Current Account Balance (1993E):** -\$1.8 billion

**Petroleum Export Revenues (1993E):** \$10.7 billion

**Oil Export Revenues / Total Export Revenues:** 75%

## ENERGY OVERVIEW

**Minister of Energy and Mines:** Erwin Jose Arrieta

**Proven Oil Reserves (1/1/94):** 63 billion barrels

**Oil Production Capacity (1993E):** 2.7 million bbl/d

**Oil Production (1993E):** 2.5 million bbl/d, of which 2.3 million bbl/d is crude oil

**OPEC Quota (2Q94):** 2.359 million bbl/d (Crude only)

**Domestic Oil Consumption (1993E):** 450,000 bbl/d

**Domestic Refining Capacity (1/1/94):** 1.2 million bbl/d

**Net Petroleum Exports (1993E):** 2.17 million bbl/d including 1.30 million bbl/d to the United States

**Natural Gas Reserves (1/1/94):** 129 trillion cubic feet

**Orimulsion Reserves (1993):** 272 billion barrels

## OIL INDUSTRY

**President of PDVSA:** Luis Giusti

**Organization:** The nationalized oil industry is governed by the Ministry of Energy and Mines. Petroleos de Venezuela (PDVSA) is the parent company and operates through subsidiaries. Subsidiaries include **Lagoven, Maraven, and Corpoven**. Three other companies, **Bitor, Interven, and Pequiven**, have been formed to manage heavy crude oil marketing, foreign investment and the petrochemical industry, respectively. PDVSA is an international oil company with major refinery, pipeline, and service station networks in Europe and the United States.

**Major Refineries:** Judibana (Amuay) (571,000 bbl/d), Punta

Cardon (286,000 bbl/d), Puerto La Cruz (195,000 bbl/d), El Palito (105,000 bbl/d), San Roque (5,200 bbl/d), El Toren (4,800 bbl/d)

**Oil Terminals:** El Palito, Judibana (Amuay), La Salina, Maracaibo, Puerto La Cruz, Puerto Miranda, Punta Cardon, Punta de Palmas

**Major Oil Fields:** Lagunillas, Bachaquero, Tia Juana, Centro

**Major Customers:** United States, Germany, Canada, Italy



**Downstream Investment:** Europe - PDVSA owns nearly 230,000 bbl/d in refining capacity through **Ruhr Oel** joint venture with Germany's **Veba** and 26,000 bbl/d through its **Nynas** partnership with Finland's **Neste**. United States - PDVSA owns 4% of U.S. refining capacity. Acquired **CITGO**, including its **Lake Charles** refinery (320,000 bbl/d capacity) as well as its network of U.S. service stations, from the bankrupt Southland Corporation in 1985-1987; purchased the **Champlin** refinery (160,000 bbl/d) at **Corpus Christi** in 1985; owns the **Seaview Petroleum Company** and its 84,000 bbl/d refinery; and holds a 50% share in **UNOCAL**'s 153,000 bbl/d **Chicago** refinery. PDVSA also has been active in the **Caribbean** region, leasing the 310,000 bbl/d **Curacao** refinery, and acquiring extensive storage facilities in the **Bahamas** and **Bonaire**. PDVSA has marketing agreements with **BP**, **Mitsubishi**, and most recently, **Florida Power & Light** for Orimulsion, Venezuela's bitumen-based boiler fuel.

## GENERAL BACKGROUND

In a boost to Venezuela's heavy oil industry, the European Union's (EU) Customs Cooperation Council voted in April to classify Orimulsion as a natural bitumen rather than a petroleum product. This decision will help PDVSA subsidiary Bitor achieve its export target of 24-million tons/year by 2004. If Orimulsion had been classified as a petroleum product

in Europe, a \$12/ton tax would have applied and kept it from being a marketable fuel in the EU.

In an action that has received strong criticism from U.S. refiners and the American Petroleum Institute, the Environmental Protection Agency (EPA) proposed to amend a portion of its reformulated gasoline rule. This change will allow Venezuelan refiners to set their own baselines to comply with the new restrictions of the Clean Air Act. In December 1993, the EPA had ruled that foreign refiners must limit the polluting factors of the gasoline they market in the United States to the average 1990 pollution levels of all U.S. refiners. Venezuela objected to this ruling, claiming that it was being held to a stricter standard than American refiners and that it could cost Venezuela \$150 million in lost revenues. Venezuela also accused the United States of using the environment as a form of economic protectionism.

## **OIL**

Venezuela has been producing oil commercially for over 70 years. Most fields have been producing for decades and require the use of enhanced oil recovery (EOR) techniques to maintain production levels. Without EOR, most of the country's fields would average a 22% natural decline in production yearly. Meanwhile, current upstream strategy in the country aims at achieving a minimum crude oil production capacity of 4 million bbl/d by 2002. This requires maintaining output at the rapidly diminishing existing fields, developing and upgrading extra-heavy crudes, exploring and producing on new higher-risk acreage, and upgrading and expansion of refinery capacities.

All of these goals require capital beyond the internal resources of Venezuela. Securing foreign investment, therefore, has become critical to Venezuela's future as an oil-exporting country. After two decades of nationalized oil and gas sectors, Venezuela is engaging in a limited program of "strategic associations," or joint ventures, to obtain the capital and technical expertise needed to achieve its objectives. Venezuela's Congress approved the first major joint ventures in August 1993 (a liquefied natural gas project and two heavy oil projects) while simultaneously lowering the tax rate to 30% on foreign companies doing business with PDVSA or its subsidiaries. This is significantly lower than the 67%

corporate tax rate for PDVSA on its conventional oil and gas operations and is aimed at attracting foreign investment.

## **Exploration and Development**

With growing market acceptance of Orimulsion as a boiler fuel, Bitor has announced plans to raise its production of the fuel to 24 million tons/year by 2004. In order to meet its goal, Bitor plans to build three new 5.2 million ton/year Orimulsion production plants at a cost of \$320 million each. Construction on the first plant is expected to begin in 1995. Meanwhile, Bitor is seeking a joint venture partner to take on some of the costs.

Corpoven announced two oil finds in the fields of Eastern Venezuela near Caripito, which could increase Corpoven's proven and probable reserves by about 2.7 billion barrels of crude and 434 billion cubic feet of gas. Corpoven is also negotiating with several foreign companies on a \$3.16 billion, 20-year project to produce 135,000 bbl/d of refined crudes from the Orinoco heavy oil belt, the largest proven oil reserves in the western hemisphere.

Lagoven's El Furrial 2 exploratory well, also near Caripito, successfully tested at 5,940 bbl/d of medium crude. Estimates for the area's reserves are about 2 billion barrels.

Maraven is busy with its 5-year \$500 million exploration program near Barinas in the Northeastern section of the Venezuelan Andes.

## **Production**

While most of Venezuela's crude production is light or medium weight, most of its proven reserves are heavy or extra heavy. This points to Venezuela's need for advanced refineries to process heavy crude into more marketable products.

Venezuela's Orinoco belt has the world's largest accumulation of extra heavy crude and bitumen, as well as substantial amounts of conventional heavy crude. PDVSA directly markets some of the Orimulsion (70% bitumen and 30% water with a surfactant) as a boiler fuel while upgrading the rest of the extra-heavy, high sulfur crude to a lighter gravity, low sulfur crude through delayed coking and

desulfurization.

### **REFINING**

Venezuela has six major refineries. The El Palito, El Toreno, Puerto La Cruz, and San Roque refineries are operated by Corpoven. The Judibana and the Punta Cardon refineries are operated by Lagoven and Maraven respectively.

A \$330 million methanol plant at Jose was opened on May 3. The plant produces over 16,000 bbl/d of methanol and is run by a joint venture between PDVSA (37.5%), Mitsubishi Corp. (23.75%), Mitsubishi Gas Chemical (23.75%), Venezuela's Emprapas Polar (10%), and the International Finance Corporation (5%). In addition, PDVSA plans to build a 200,000-280,000 bbl/d refinery at Jose near Puerto La Cruz in a joint venture with one or more foreign companies. The refinery will process heavy crude from the Orinoco belt and turn it into a more profitable medium or light crude.

### **NATURAL GAS**

The Cristobal Colon liquefied natural gas (LNG) export project received congressional approval in August 1993. The \$5.6 billion project, a joint venture between PDVSA's Lagoven (33%), Royal Dutch/Shell (30%), Exxon (29%) and Mitsubishi (8%), will be the biggest ever undertaken in Venezuela's petroleum industry. Plans are to export up to 6 million tons/year of LNG to the U.S. Northeast and Europe. Gas will be supplied by four fields in the Caribbean Sea north of the Paria Peninsula in eastern Venezuela. The fields will be connected by two pipelines, one 45-km (28-mile) line and one 32-km (20-mile) line that will

carry the gas to an LNG plant onshore near Mapire. Final cost of the project will depend on whether the group purchases or leases five or six 50,000 dead weight ton LNG carriers.

# Vietnam

## COUNTRY OVERVIEW

**President:** Le Duc Anh

**Population (1994E):** 73 million

**Location/Size:** Southeast Asia/329,560 sq km (127,210 sq mi), slightly larger than New Mexico

**Language:** Vietnamese, French, Chinese, English, Khmer, tribal languages

**Religion:** Buddhist, Confucian, Taoist, Roman Catholic, indigenous beliefs, Islamic, Protestant

**Ethnic Divisions:** Vietnamese (85-90%), Chinese, Muong, Thai, Meo, Khmer, Man, Cham

**Defense:** Army (900,000), Navy (31,000), Air Force (10,000), Air Defense Force (100,000)

**Major Cities:** Hanoi (capital), Da Nang, Ho Chi Minh City, Vung Tau

**Import Products:** Petroleum products, steel products, railroad equipment, chemicals

**Export Products:** Crude oil, agricultural and handicraft products, coal

**Major Trading Partners:** Japan, Singapore, Thailand, Taiwan, Hong Kong

## ECONOMIC OVERVIEW

**Gross National Product (1993E):** \$72 billion

**GNP Real Growth Rate (1993E):** 7%

**Monetary Reserves (1992):** \$165 million

**Currency:** dong

**Exchange Rate (9/94):** US \$1 = 11,100 dong

**Total Foreign Debt (1990E):** \$16.8 billion

**Petroleum Revenue (1992):** \$1 billion

**Petroleum Revenues/Total Export Revenues (1993E):** 33%

## ENERGY OVERVIEW

**Minister of Energy, Mines, and Coal:** Thai Phung Ne

**Proven Oil Reserves (1/1/94):** 830 million barrels

**Oil Production Capacity (1994E):** 140,000 barrels per day (bbl/d)

**Total Oil Production (1993):** 123,000 bbl/d

**Domestic Oil Consumption (1993):** 85,000 bbl/d

**Net Oil Exports (1993):** 38,000 bbl/d

**Natural Gas Reserves (1/1/94):** 3.7 trillion cubic feet (Tcf)

## OIL INDUSTRY

**Organization:** State-owned oil company, PetroVietnam

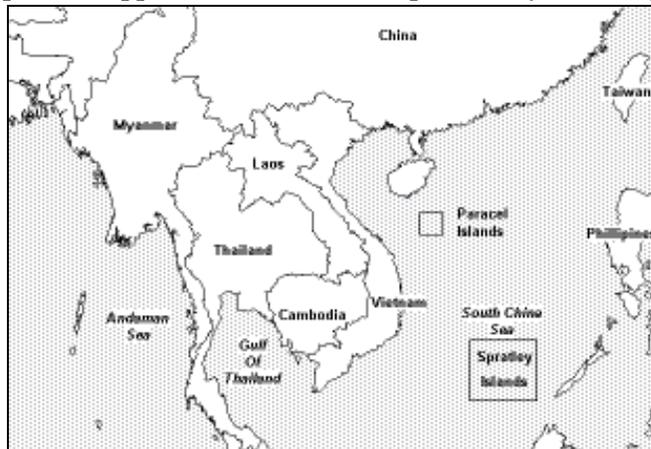
**Major Ports:** Da Nang, Haiphong, Ho Chi Minh City

**Major Fields:** Bach Ho (White Tiger), Dai Hung (Big Bear), Rong (Dragon), Thanh Long (Blue Dragon)

**Major Customers:** Japan, Singapore, Thailand, Russia

## GENERAL BACKGROUND

Vietnamese economic growth was spurred by the initiation of free market reforms in 1986 and by the implementation of the country's first foreign investment law in 1988. Increases in gross domestic product (GDP) have averaged 7.1 percent over the past three years, and the 1994 growth target of 8.5 percent appears achievable, despite heavy flooding



this year which destroyed rice crops in the Mekong and Red River deltas. The Vietnamese government plans to double Vietnam's GDP by the year 2000 and projects a required investment of between \$45 and \$55 billion to attain this goal.

After paying off accumulated arrears of \$142 million to the IMF and the World Bank in October 1993, Vietnam became eligible to receive loans from these institutions. Shortly thereafter, the IMF approved a credit package for Vietnam of \$233 million, and the World Bank agreed to insure up to \$100 million of foreign investments in Vietnam. In June 1994, Vietnam received \$100 million from foreign banks, the country's first commercial loan since economic reforms began.

Foreign investment in Vietnam totals over 980 projects worth \$9.5 billion. Vietnam has signed almost 30 production-sharing contracts with foreign oil and gas companies since 1988. Investment by U.S. companies during the first half of 1994 reached \$142 million and is expected to grow as more companies find niches in Vietnam's emerging markets.

The ongoing dispute between Vietnam and China

over the Spratly Islands in the South China Sea continues to pose an operating risk for foreign oil companies. Vietnam and China, as well as Taiwan, Malaysia, Brunei, and the Philippines claim all or part of the islands. China adopted legislation in 1992 in which it reserves the right to use force to defend its maritime interests. Subsequently, Vietnam endorsed the Association of Southeast Asian Nations' (ASEAN) legislation which calls for the peaceful arbitration of territorial claims, and in June 1994, Vietnam adopted the United Nations Convention on the Law of the Sea, which permits a country to claim land as far as 312 miles from its shore.

In May 1992, U.S.-based Crestone Energy signed a contract with China to conduct exploration in an oil-rich area west of the Spratlys claimed by Vietnam. Likewise, Vietnam has signed contracts with Mobil, Atlantic Richfield (ARCO), and Occidental Petroleum to conduct exploration in adjacent fields which are claimed by China. In December 1993, both Vietnam and China agreed to end their dispute. In August 1994, talks entered a second round after China sent two warships to blockade a Vietnamese drilling platform in the Tu Chinh area. The warships reportedly stopped at least one Vietnamese supply ship.

The United States lifted its 19-year trade embargo against Vietnam in February 1994. This move was foreshadowed by a gradual loosening of restrictions on investment by U.S. companies during 1993. In July 1993, the United States dropped its opposition to loans from international development agencies to Vietnam and in December it allowed U.S. firms to work on contracts financed by those agencies. The United States is discussing the possibility of normalizing relations with Vietnam, and an agreement was reached in June 1994 to establish diplomatic missions in both countries. In addition, Vietnam is hoping to receive Most Favored Nation (MFN) trading status from the United States.

## **OIL**

Virtually all of Vietnam's proven oil reserves exist offshore in four fields located in the South China Sea: Bach Ho (White Tiger), Rong (Dragon), Dai Hung (Big Bear), and Thanh Long (Blue Dragon). Bach Ho is the only field producing oil in commercial

quantities. As Vietnam has little refining capacity, the majority of Bach Ho crude production is sold to Japanese trading houses under fixed-volume contracts. The oil is used exclusively for direct burning in Japanese power stations. To increase the sale price of Bach Ho crude, which has a relatively light gravity of 33° API, Vietnam has begun to sell a larger percentage of its export to independent refiners and marketers for refining and re-sale rather than direct burning. This practice offers the potential to increase Vietnam's oil export revenues, especially as crude from the Thanh Long field, which has a 39° API gravity and is comparable to high quality Malaysian Tapis crude, becomes available for sale.

The Bach Ho field, which began producing in 1986, was discovered by Mobil in 1975, but was developed only after the Vietnam War by Vietsovetro, the Vietnamese-Soviet joint venture. The field is located 80 miles southeast of the port city of Vung Tau in shallow water and contains up to 500 million barrels of recoverable oil reserves. Vietsovetro runs all production at Bach Ho, and its current output of around 120,000 bbl/d is expected to decrease towards the end of the century.

In order to offset the anticipated decline of Bach Ho, Vietnam is making an effort to acquire Western capital and technical expertise necessary to fully develop its oil resources. In July 1994, Vietnam announced that it would be willing to form joint ventures with foreign companies and to share in exploration risks. At an upcoming offering, PetroVietnam is planning to auction two blocks adjacent to Bach Ho which had previously been allocated to Vietsovetro for exploration. This auction has acquired increased importance after two recent discoveries nearby. In June 1994, Mitsubishi Oil found what may be the largest oil field in Southeast Asia. In August, Malaysia's Petronas Carigali found other light, sweet crude reserves in the adjacent Ruby Prospect concession. Two U.S. companies, ARCO and Occidental, began drilling exploratory wells near Bach Ho in the summer of 1994.

The Rong field is located six miles to the southwest of Bach Ho and contains estimated recoverable oil reserves of up to 300 million barrels. Vietsovetro is

developing Rong, and the field is predicted to start production with a 15,000 bbl/d output of 10° API crude by October 1994. In early 1994, disagreements were reported between Vietnam and Russia concerning the connection of Rong's gas fields to a proposed offshore gas transmission network. There were also rumors that Petrovietnam was considering purchasing Russia's stake in the Rong field in order to offer it for re-sale to Western companies with more technological expertise. A similar occurrence took place at Dai Hung, where Australian Broken Hill Proprietary (BHP) acquired blocks which belonged originally to Vietsovpetro.

The Dai Hung field is located in deeper water to the southeast of Bach Ho and Rong. A consortium led by BHP is developing the field and production is expected to begin in October 1994. Dai Hung's exact size has proved elusive because of the field's complex, fragmented structure. Early estimates from three Vietsovpetro test wells indicated that recoverable reserves might be as high as 800 million barrels. After a fourth drilling by BHP in early 1994, estimates were downsized to possibly as high as 500 million barrels, but BHP officials doubt that an exact size will be known before 1995. Total development costs at Dai Hung are expected to reach \$1.9 billion over the lifetime of the project. Initial output of 30,000 bbl/d is expected to increase during the second phase of the project with the utilization of two additional production platforms, including one to provide gas injection. Anticipated production levels are 120,000 bbl/d by 1997 and 230,000 bbl/d by 2000. The natural elements pose a hazard at Dai Hung. In addition to deep water and strong currents, which require the use of a floating semi-submersible platform, Dai Hung is in an area prone to typhoons. As of September 1994, the Dai Hung platform was being outfitted in Singapore to survive these harsh weather conditions. One industry official stated that if the platform is not in place by October, production likely would be delayed for five months due to typhoons.

Blocks in Thanh Long field were awarded in early 1994. A consortium led by Mobil won the exploration contract and holds a 72.5 percent interest in the field. Mobil's presence marks the first return of a U.S. oil company to Vietnam since 1975. Estimates of Thanh

Long's size range from 200 million to as high as one billion barrels. Mobil is using some of its old seismic data from the field, and reports in early September 1994 indicate that the consortium had spudded its first well in Thanh Long.

### **REFINING**

Vietnam's strong economic growth is increasing the country's domestic energy demand. Consumption of refined petrochemical products is expected to triple by 2010. In order to help meet this future demand and also to increase the sale price of its oil, Petrovietnam plans to borrow \$1 billion for various downstream construction projects, including two refineries, a distillation tower, and a lubricants plant. The first refinery will be built at Khanh Hoa in southern Vietnam by a consortium led by Total. It will have a projected capacity of 130,000 bbl/d and become operational by 1999. A second 100,000 bbl/d refinery

is scheduled for construction in the northern part of the country and will come on line one to two years after the first refinery.

### **NATURAL GAS**

In mid-September, British Petroleum announced the discovery of a gas field which may contain between two and three billion cubic feet of gas. A proposed pipeline, which would carry one million cubic meters of gas per day from nearby Bach Ho to the port at Vung Tau, is under study by British Gas, Mitsui, and PetroVietnam as part of a gas utilization project. Currently, Vietsovpetro is flaring off almost 35 billion cubic feet of gas per year because of the lack of a domestic gas market. Under PetroVietnam's development plan, a \$400 million plant at Vung Tao would convert the gas into liquid form for export by tanker and for domestic use by pipeline to Ho Chi Minh City. One additional project to take advantage of Vietnam's abundance of gas resources is the proposed construction near Ho Chi Minh City of a 600-megawatt power plant designed to operate on natural gas.

### **ELECTRIC POWER**

Currently, about 85 percent of Vietnam's cities and over half of its villages are electrified, and Vietnam plans to extend this to the entire country by 2000. The first step toward this goal was taken with the completion of the Hoa Binh hydroelectric dam near Hanoi in May 1994. Hoa Binh is a 1,920-megawatt plant which cost \$500 million and took ten years to build. Its eight turbines will form the basis for a national power grid conveying electricity along a 922-mile transmission line network to supply energy to southern Vietnam. Hoa Binh now generates about 45 percent of the country's electricity requirements. Two other hydroelectric plants, which will cost \$600 million, are planned for construction near Ho Chi Minh City beginning in 1996.

## **Yemen**

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### **COUNTRY OVERVIEW**

**Head of Government:** President Ali Abdullah Saleh

**Population (7/93):** 10.7 million

**Location/Size:** Southwest corner of the Arabian Peninsula/ 527,970 sq km (203,796 sq mi), approximately the size of Wyoming and Colorado

**Language:** Arabic

**Religion:** 99% Muslim (53% Sunni, 46% Shiite)

**Ethnic Divisions:** Arab, Afro-Arab, South Asians, Somalis, Europeans

**Defense:** (North) Army 37,000; Navy 500; Air Force 1,000; (South) Army 24,000; Navy 1,000; Air Force 2,500

**Major Cities:** Sanaa (capital), Aden, Al Hudaydah, Taizz

**Major Import Products:** Textiles, manufactured consumer goods, foodstuffs, sugar, grain, flour, petroleum products

**Major Export Products:** Crude oil, cotton, coffee, hides, vegetables, dried and salted fish

**Major Trading Partners:** United States, Japan, Saudi Arabia, Russia, China, South Korea, Australia, European Union

### **ECONOMIC OVERVIEW**

**External Debt (8/92):** \$7.8 billion

**Gross Domestic Product (1993 exchange rate conversion):** \$9 billion

**Currency:** Rial

**Exchange Rate (6/94):** 1 \$US=12 Rials

**Oil Revenues (1992):** \$400 million

### **ENERGY OVERVIEW**

**Minister of Petroleum & Mineral Resources:** Faisal Othman Bin Shamlan

**Proven Oil Reserves (1/1/94):** 4 billion barrels

**Oil Production Capacity (2Q94E):** 350,000 bbl/d

**Oil Production (2Q94E):** 350,000 bbl/d

**Domestic Oil Consumption (1993E):** 55,000 bbl/d

**Oil Exports (1993E):** 243,000 bbl/d

**Refining Capacity (1/1/94):** 120,000 bbl/d

**Natural Gas Reserves (1/1/94):** 15 trillion cubic feet (Tcf)

### **OIL INDUSTRY**

**Organization:** *Yemen Petroleum Company (YPC)* - production and refining; *Yemen Company for Investment in Oil and Mineral Resources (YCIOMR)* - investment and holding company; *Yemen Refining Company (YRC)* - refining; *General Department of Crude Oil Marketing (GDCOM)* - handles government shares of exports; *Yemen Exploration and Production Company (YEPC)* - contracts

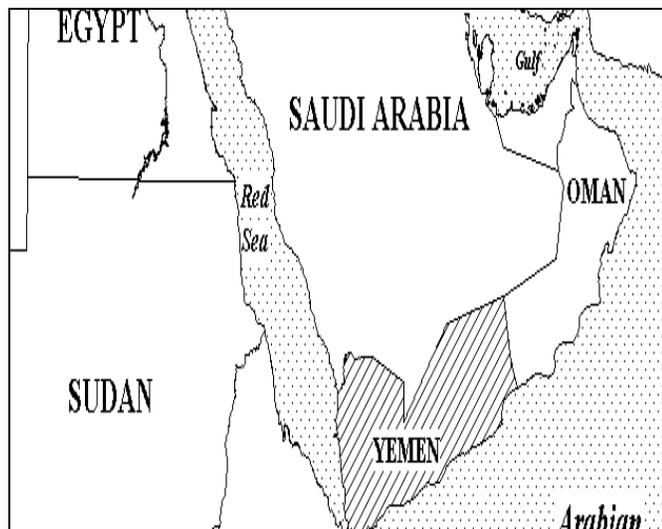
**Major Oil Fields:** Masila, Alif, Marib, Shabwa

**Major Refineries (Capacity):** Aden (110,000 bbl/d), Marib (10,000 bbl/d)

**Major Pipelines:** Marib-Ra's Isa Pipeline (pipeline between the Marib fields and the deep sea port of Ra's Isa on the Red Sea), Shabwa-Rudhum Pipeline (pipeline linking the Shabwa fields to the Rudhum terminal on the Gulf of Aden at Hisn an Nushaymah)

**Major Ports:** Aden, Ra's Isa, Hisn an Nushaymah

**Major Customers:** Europe, Far East



### **GENERAL BACKGROUND**

The union of former North and South Yemen, which took place in May 1990, has been uneasy due largely to political and ideological differences between the conservative tribal North and the socialist South. In February 1994, President Ali Abdullah Saleh, a northerner, and Vice President Ali Salem Al-Beidh, a southerner, failed to reconcile these differences in political talks.

On May 5, 1994, civil war broke out between southern Yemen and northern Yemen, with air attacks from both sides and widespread fighting throughout the country. President Saleh declared a 30-day state of emergency. By mid-June, northern Yemen had advanced on Aden, capital of South Yemen and site of Yemen's largest refinery, but was not able to secure the city. As of late June, oil flows had not been significantly affected. Both Hunt Oil and Canadian Occidental (CanOxy), Yemen's two largest oil producers, evacuated all non-essential personnel and civilians but essential personnel maintained production.

The eighth round of Saudi-Yemeni border talks, which had been scheduled for April 1994, were postponed at the request of the Yemeni government. The postponement was due largely to internal political crisis in Yemen. The two sides agreed to discuss a new date for the resumption of talks. Border talks between Yemen and Saudi Arabia began in September 1992, marking the first such talks between the two countries since 1974.

The border dispute between Yemen and Saudi Arabia flared in March 1992, when the Saudi Ministry of Foreign Affairs sent six letters to international oil companies who were carrying out exploration activities in the disputed areas of North Yemen. It is understood that while the atmosphere at the talks would enable oil companies operating in the disputed areas to continue their work, a final settlement of the border issue remains a long-term prospect.

Saudi Arabia and Yemen have experienced a strained relationship since 1990, when Yemen opposed Saudi Arabia's call for military aid to counter Iraq's invasion of Kuwait and abstained on the United Nation's resolution imposing sanctions on Iraq. During the war, Saudi Arabia expelled one million Yemeni workers, depriving Yemen of hundreds of millions of dollars in remittances.

### **OIL**

Oil in commercial quantities was first discovered in northern Yemen by the Dallas-based Hunt Oil Company in 1984, with crude exports commencing in 1987. Yemen Hunt, operating in North Yemen, is still the country's major crude oil producer, accounting for around 200,000 bbl/d of 40° API crude oil output.

In 1994, seven international oil companies faced decisions on retaining or rejecting ten exploration concessions in Yemen. Although foreign companies signed a range of production-sharing agreements in new areas of Yemen following unification in 1990, oil has been proven in only 5 of more than 40 blocks.

One of the more successful blocks is Masila, which began producing 35° API crude oil in July 1993.

The Masila block consists of the Heijah, Sunah, Camaal, North Camaal, Tawila, Haru, Heimar, North Heimar, South Heimar and Naziah fields. CanOxy, operator of the block, increased oil output in November from 55,000 bbl/d to 120,000 bbl/d, raising Yemen's total oil output to approximately 350,000 bbl/d. CanOxy has a 52% interest in the block, and its partners are US Shell subsidiary Pecten Yemen (20%), Occidental Inc. of the US (18%) and the Lebanese Consolidated Contractors Company (10%). Total reserves for the Masila block, which is located in southern Yemen, are estimated at 546 million barrels, of which 317 million barrels are considered proven and 229 million barrels are considered probable.

In September 1993, work on Total's East Shabwa discovery, which is adjacent to CanOxy's Masila block, was brought to a standstill by a tribal raid. The French company had been on schedule to bring production of about 40,000 bbl/d onstream by mid-1994. Other foreign oil companies (Hunt, Royal/Dutch Shell, Arco) operating in Yemen also have experienced such raids. Most observers attribute such difficulties to the country's economic and political problems. One of the world's poorest countries, Yemen suffers from inflation of nearly 200% annually and a 36% unemployment rate.

### **REFINING**

Yemen has two refineries - a 110,000 bbl/d plant in Aden and a 10,000 bbl/d refinery in Marib. Yemen plans to begin renovation and expansion of its aging refinery in Aden, which was built in 1954. The work will include construction of 16 storage tanks for crude oil and refined products and refurbishment of seven existing tanks. Expansion possibilities include construction of pipelines and gas processing facilities, and facilities to process heavier products, such as residual fuel oil and distillate.

The Marib refinery, which was inaugurated in 1986, has a distillation unit and a reforming unit. Marib was designed to process locally-produced crude from the Alif field. Yemen is conducting a feasibility study for the construction of another refinery or the possible upgrading of the Marib plant to double its capacity to 20,000 bbl/d.

### **NATURAL GAS**

The Yemeni government is currently in the process of developing a 5-million-ton-per-year liquefied natural gas (LNG) project. Natural gas reserves required for the LNG project were discovered by Hunt and Exxon in the Marib area. The Marib gas reserves are subject to a production-sharing agreement between Hunt-Exxon and the government of Yemen. In addition, a group of South Korean companies led by Yukong Ltd. holds a 24.5% interest in the Marib area. Investment in the LNG project totals about \$5.4 billion, of which \$3 billion is to be provided by the Hunt-Exxon-Yukong consortium.

## Appendix: Energy Chronology 1994

The following chronology lists international events of significance to world energy markets in 1994. Sources include: *Baltimore Sun (BS)*; *Cambridge Energy Research Associates (CERA)*; *Chicago Tribune (CT)*; *Dallas Morning News (DMN)*; *Dow Jones (DJ)*; *Energy Compass (EC)*; *Energy Market Consultants (EMC)*; *Financial Times (FT)*; *Greenwire (GW)*; *Herold's Oil Headliner (HOH)*; *New York Times (NYT)*; *Reuters (R)*; *Wall Street Journal (WSJ)*; *Washington Post (WP)*; and *Washington Times (WT)*.

- Jan. 1** The North American Free Trade Agreement (NAFTA) between the United States, Canada, and Mexico takes effect. Coinciding with NAFTA's implementation is the first organized guerrilla activity in Mexico since the 1970's, which is staged by the previously unknown Zapatista Army of National Liberation. (WSJ)
- Jan. 2** Guerrillas of the National Liberation Army bomb a section of Colombia's main, 500-mile Cano-Limon oil pipeline, spilling oil and suspending operation of the pipeline. The 230,000 barrels per day (b/d) pipeline was attacked 39 times in 1993. (DJ)
- Jan. 3** Guerrillas believed to be members of the separatist Front for the Liberation of the Enclave of Cabinda (FLEC) attack the camp of Chevron oil workers in Angola. Chevron is the principal operator of the Cabinda Gulf Oil Company. (DJ)
- Jan. 11** Algeria's Islamic movement stages a deadly attack on a provincial governor, killing the official and 18 others. More than 2,000 people are estimated to have been killed since Algeria's electoral process was suspended 2 years ago. This includes 24 foreigners killed in an anti-foreign campaign begun in September 1993. (CERA)
- Jan. 13** Iraq again refuses a one-time oil sale of \$1.6 billion for humanitarian supplies, holding out for the total lifting of the United Nations (U.N.) oil embargo. (DJ)
- Jan. 14** Ukrainian President Leonid Kravchuk signs an agreement with the United States and Russia to dismantle all of Ukraine's 1,800 nuclear warheads. Separately, Presidents Bill Clinton and Boris Yeltsin agree to stop aiming long-range nuclear missiles at each other's territory. (DJ)
- Jan. 18** The U.S. Department of Energy announces that a joint government-industry effort has developed an energy gathering material that could halve the cost of solar power. (WP)
- Jan. 18** The U.N. Security Council extends economic sanctions against Iraq for another 60 days. (DJ)
- Jan. 18** An earthquake measuring 6.5 on the Richter scale strikes Southern California. Several refineries--including Texaco (100,000 b/d), Unocal (125,000 b/d), Mobil (140,000 b/d), and Chevron (235,000 b/d)--are shut down because of power outages. (HOH)
- Jan. 20** A week long cold spell in the Midwest, Northeast and parts of the South strains energy supplies. Several utility companies ask local businesses and governments to shut down for

at least one day to reduce their load. (*WP*)

**Jan. 24** Russia opens the first auction of a natural gas producer in its privatization program. Russian investors may use privatization vouchers to bid for a 6% stake in Norilskgazprom, a mid-sized gas company. (*WSJ*)

- Jan. 30** Algeria's army-backed leadership appoints Defense Minister Liamine Zeroual as President to serve a 3-year transition term. Algeria has been ruled by an unelected council since January 1992, when election results were canceled due to fears of a fundamentalist victory. *(WP)*
- Jan. 31** Venezuela's President-elect Rafael Caldera names Erwin Jose Arrieta Valera as the country's new oil minister, replacing Alirio Parra (who has held the post since 1992). *(DJ)*
- Feb. 1** Iranian President Hashemi Rafsanjani is the target of an unsuccessful assassination attempt as he addresses a crowd marking the 15th anniversary of the Islamic Revolution. *(DJ)*
- Feb. 2** Rafael Caldera is inaugurated as the new president of Venezuela. *(DJ)*
- Feb. 3** President Clinton orders an end to the U.S. trade embargo against Vietnam. *(NYT)*
- Feb. 3** The privatization of France's state oil company, Societe Nationale Elf Aquitaine, gets underway with a week-long public share offering. *(DJ)*
- Feb. 3** Ukraine's Parliament removes conditions on its approval of the START 1 treaty and the related Lisbon Protocol, under which its nuclear weapons are to be surrendered to Russia for dismantling, but refuses to join the Nuclear Non-Proliferation Treaty. *(DJ)*
- Feb. 6** Chinese Premier Li Peng officially opens the first of two 900-megawatt nuclear reactors at the Daya Bay plant, the country's largest nuclear plant. *(DJ)*
- Feb. 14** President Clinton pledges a tripling of foreign aid to Kazakhstan (to \$311 million) to help efforts at political reform, assist in the dismantling of nuclear weapons, and provide critical underpinning for dozens of American companies involved in the former Soviet republic's oil boom. *(NYT)*
- Feb. 15** The International Atomic Energy Agency (IAEA) reports that all plutonium or highly enriched uranium that could be used to manufacture nuclear weapons has been removed from Iraq. *(DJ)*
- Feb. 15** North Korea agrees to U.N.-supported demands that it open part of its nuclear program to international inspection. *(DJ)*
- Feb. 16** Foothills Pipe Lines Ltd. curtails 90 percent of its natural gas shipments from Canada to the United States following a rupture in a key pipeline. *(DJ)*
- Feb. 21** Researchers at the national meeting of the American Association for the Advancement of Science report that ozone-depleting chlorofluorocarbons, or CFCs, increased at a rate of 4 percent annually through the 1980s, but the rate has now slowed to about 2 percent. *(DMN)*
- Feb. 23** An official of Russia's State Property Committee reports plans to auction 28.7 percent of Gazprom, the country's giant natural gas production and distribution company, to a limited

- group of Russian investors in March and April. *(DJ)*
- Feb. 24** Angola's petroleum minister Albina Assis confirms that Angola's government has offered autonomy to its oil-rich Cabinda enclave in a bid to win the region's secessionist guerrillas to its side in the war against UNITA rebels. *(DJ)*
- Feb. 25** North Korea agrees to international inspections of its nuclear facilities by March 1. *(WP)*
- Feb. 25** About 20,000 Australian coal miners go on strike protesting cuts in prices of coal shipped to Japanese steel mills. Australia is the world's biggest coal exporter. *(DJ)*
- Feb. 28** Kazakhstan's State Property Committee announces plans to offer 38 of its largest state-owned companies--including oil producers and refiners--to foreign investors in 1994. *(DJ)*
- Mar. 2** Following through on an earlier threat, Gazprom begins cutting back on natural gas shipments to Ukraine and Belarus. Gazprom claims it is owed 1.2 trillion rubles by Ukraine, and 500 billion rubles by Belarus, in back payments for natural gas supplies since 1993. *(DJ)*
- Mar. 3** IAEA experts resume inspections of North Korean nuclear facilities, nearly a year after North Korea announced its withdrawal from the Nuclear Non-Proliferation Treaty. *(WP)*
- Mar. 5** In accordance with a denuclearization treaty signed in January by the U.S., Russian, and Ukrainian Presidents, Ukraine begins moving about 60 nuclear warheads for disposal by Russia. *(WP)*
- Mar. 6** Ukrainian President Leonid Kravchuk warns that cutbacks in Russian natural gas shipments could interfere with Ukraine's decision to give up its nuclear arsenal. Kravchuk also says that Ukraine has no money to pay for Russian gas supplies. *(DJ)*
- Mar. 8** President Clinton signs an executive order directing federal agencies to reduce their energy consumption 30 percent from 1985 levels by the year 2005. *(WP)*
- Mar. 13** A Russian oil tanker collides with another ship in the Bosphorus Straits linking the Black Sea and the Mediterranean, setting the tanker on fire and closing the waterway. The Bosphorus is the export route for around 1 MMBD of Russian oil exports, mainly to Europe. *(DJ)*
- Mar. 15** President Clinton extends the moratorium on U.S. nuclear weapons testing for a year, through September 1995. *(DJ)*
- Mar. 16** Russia and the United States agree for the first time to allow mutual inspections of storage facilities for plutonium triggers from dismantled nuclear warheads. Russia also agrees to phase out its production of weapons-grade plutonium from 3 remaining weapons reactors at Tomsk and Krasnoyarsk. *(DJ)*

- Mar. 16** In response to North Korea's interference with the work of international nuclear inspectors, the United States cancels high-level talks with North Korea and steps up planning for military exercises with South Korea. *(NYT)*
- Mar. 18** The U.N. Security Council votes to maintain sanctions on Iraq. *(DJ)*
- Mar. 21** President Clinton orders a battalion of Patriot missiles to South Korea, and reiterates the U.S. commitment to defend South Korea in the event of an attack by North Korea. *(WP)*
- Mar. 23** Mexican Presidential candidate Luis Donaldo Colosio is assassinated during a campaign appearance in Tijuana. *(WP)*
- April 9** Ukraine agrees to close down remaining nuclear reactors at Chernobyl, site of the world's worst nuclear power plant disaster, which took place in 1986. The United States agrees to assist Ukraine in replacing the lost electric generating capacity. *(NYT)*
- April 11** Algeria's Prime Minister, Redha Malek, submits his resignation to President Liamine Zeroual. President Zeroual immediately names Mokdad Sifi to form a new government. *(DJ)*
- April 12** Russia's natural gas company, Gazprom, and the Ukrainian government agree on a schedule for repaying Ukraine's \$600 million debt for Russian gas. *(DJ)*
- April 13** Abdul Mohsen al Madaaj, a university professor, is named oil minister in Kuwait's new cabinet. He replaces Ali Ahmed al-Baghli, who had served as Kuwait's oil minister since October 1992. *(DJ)*
- April 14** Mexico is invited to join the Organization for Economic Cooperation and Development (OECD), becoming the first developing nation to join the OECD and its first new member in 21 years. Mexico's membership, expected to be formalized within a few weeks, will bring the OECD total to 25 countries. *(DJ)*
- April 15** Algeria names petroleum executive Amar Makhoulfi as its new energy minister. *(DJ)*
- April 15** Presidents Boris Yeltsin of Russia and Leonid Kravchuk of Ukraine sign an agreement giving Russia 80-85% of the ships in the Black Sea Fleet. The two former Soviet Republics have argued over control of the fleet since the collapse of the Soviet Union in 1991. *(DJ)*
- April 19** Mobil Corp. signs a production sharing contract to explore for oil off the southern coast of Vietnam, becoming the first American company to drill in Vietnamese waters since the end of the Vietnam War in 1975. *(DJ)*
- April 20** The International Monetary Fund approves a \$1.5 billion credit to Russia from its Systemic Transformation Facility (STF) program to support further economic reforms in the former Soviet Union. *(DJ)*
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- April 20** California's Public Utilities Commission approves a proposal that would partially deregulate the State's electric industries and allow market forces to set the price of electricity. A final policy is expected to be adopted by August, following a comment period. *(DJ)*
- April 20** The U.S. Department of Energy signs a "memorandum of understanding" with utility companies committing them by the year 2000 to reduce to 1990 levels their emissions of carbon dioxide and other chemicals believed to contribute to global warming. *(WSJ)*
- April 22** South Korean Prime Minister Lee Hoi-Chang resigns and is replaced by Lee Young-duk. *(DJ)*
- April 25** Officials at Corpoven, an affiliate of Venezuela's state oil company, report that a labor dispute has forced a complete shutdown of its 75,000 b/d Oritupano field. *(DJ)*
- April 30** The IAEA announces that North Korea has rejected demands for a detailed inspection of spent nuclear-reactor fuel, which could be used to produce a nuclear weapon. *(WP)*
- May 3** The U.S. Supreme Court rules that cities must follow federal hazardous waste rules when disposing of ash from municipal waste-to-energy plants. It is feared that the ruling could harm the economic viability of such plants. *(WSJ)*
- May 4** Israel and the Palestine Liberation Organization sign an historic accord giving the Palestinians limited self-rule in the Gaza Strip and the West Bank town of Jericho. *(DJ)*
- May 4** Azerbaijan, which produced 208,000 b/d of oil in 1993, joins NATO's Partnership for Peace program. The program provides the means by which the former Eastern Bloc countries may pursue post-Cold War military and political cooperation with western allies. *(DJ)*
- May 5** After months of growing tensions, civil war breaks out between northern and southern Yemen. Yemen exports about 250,000 b/d of oil of its production of 320,000 b/d. *(EMC)*
- May 6** Fire breaks out at Russia's Beloyarsk nuclear plant - the world's second largest fast breeder reactor. No radiation leaks or injuries are reported. *(DJ)*
- May 9** The U.N. committee responsible for compensating victims of Iraq's invasion of Kuwait says Turkish-Iraqi plans to drain and refine around 12 million barrels of crude oil from the Iraq-Turkey pipeline would violate relevant U.N. Security Council resolutions. *(DJ)*
- May 12** China denounces Vietnam's recent contract with U.S. oil company Mobil as a violation of Beijing's sovereignty in the South China Sea, but pledges to settle all disputes peacefully. *(FT)*
- May 13** In a 9-to-4 vote, the board of the Washington Public Power Supply System (WPPSS) votes to terminate two unfinished nuclear plants following a decade of political, financial, and legal battles. *(NYT)*

- May 15** Thirteen years after signing a peace treaty, Israel and Egypt agree to their first major joint venture, a \$1 billion oil refinery to be built in the Egyptian port city of Alexandria. *(DJ)*
- May 20** Crimea's regional parliament votes to approve a constitution which Ukraine's national government fears will lead to secession. Tensions have increased in recent weeks between Ukraine and Russia over the status of Crimea, which contains a large Russian minority. *(DJ)*
- May 24** Northern Yemeni forces seize the southern Yemeni city of Ataq, capital of oil-rich Shabwah province. *(WP)*
- May 27** Kazakhstan joins NATO's Partnership for Peace program. *(NYT)*
- May 30** An experimental fusion reactor at the Princeton Plasma Physics Laboratory produces a 9 million watt burst (0.25 seconds) of fusion power, a new world record. *(NYT)*
- June 2** The IAEA reports it can no longer verify the status of North Korea's nuclear program. The United States announces plans to seek economic sanctions. *(DJ)*
- June 2** The U.S. Environmental Protection Agency issues the first federal exhaust-emission standards ever for tractors, forklifts, and other diesel-powered nonroad vehicles. *(WSJ)*
- June 4** British Gas and Atlantic Richfield begin drilling their first exploratory gas and oil well in a South China Sea block awarded by Vietnam but partially claimed by China. *(WSJ)*
- June 8** Russia signs an agreement with the OECD that will facilitate Russia's integration into the world economy by providing OECD assistance in the design and implementation of market-oriented reforms. *(DJ)*

- June 9** Brazil inaugurates the world's largest deep-sea production platform. According to the state oil company, Petrobras, the \$272 million platform in the Marlim oil field off Brazil's southeast coast has a production capacity of 100,000 b/d of oil and 4.2 billion cubic meters/day (148 million cubic feet/day) of natural gas. *(DJ)*
- June 13** North Korea announces it is withdrawing from the IAEA and will not accept further inspections of its nuclear program. *(DJ)*
- June 15** At its mid-year ministerial conference, the Organization of Petroleum Exporting Countries (OPEC) reaffirms its current production ceiling of 24.52 million b/d through the end of 1994. *(DJ)*
- June 19** Ernesto Samper, an economist, is elected president of Colombia. *(DJ)*
- June 20** Regulatory agencies from 20 States file a lawsuit in the U.S. Court of Appeals demanding that the Department of Energy provide a disposal facility for high-level radioactive wastes from nuclear power plants. *(GW)*
- June 22** Russia joins the North Atlantic Treaty Organization's (NATO) Partnership for Peace Program. *(DJ)*
- June 22** President Clinton suspends U.S. efforts to impose U.N. sanctions on North Korea and announces he is willing to resume high-level talks because North Korea agreed 1) not to reprocess spent plutonium removed from an experimental reactor; 2) not to refuel the reactor; and 3) to allow international inspectors to maintain safeguards against nuclear proliferation. The announcement follows a mission to North Korea by former President Jimmy Carter. *(DJ)*
- June 24** Russian President Boris Yeltsin signs a partnership accord with the European Union. Under the agreement, Russia will be considered an "economy in transition" and trade quotas will be replaced by tariffs. *(DJ)*
- June 29** The World Bank announces a \$500 million loan to Russia to support oil production rehabilitation by three oil producer associations in Western Siberia. World Bank support to Russia in all sectors of the economy now totals \$1.5 billion in fiscal year 1994. *(DJ)*
- June 30** The U.S. Environmental Protection Agency announces that, effective January 1, 1995, 15% of the gasoline sold in the most polluted U.S. cities must contain additives, such as grain alcohol, that are derived from corn or other renewable sources. The share rises to 30% in 1996. *(WP)*
- July 1** Oil production from the 180,000 b/d Marib oil concession in north Yemen is halted following an air raid in Yemen's eight week-old civil war. *(DJ)*
- July 3** An idle Iraq-Turkey pipeline catches fire after Kurdish guerrillas bomb it. This is the fourth

- attack on the pipeline in four months. *(DJ)*
- July 4** Nigeria's powerful oil workers' union, the National Union of Petroleum and Natural Gas Workers, halts work in a pro-democracy strike. The union is demanding that the military government release Moshood Abiola, the apparent winner of the June 12, 1993 presidential election, from jail. *(R)*
- July 5** Workers at Brazil's state oil company, Petrobras, strike in demand of a 50% pay increase, closing 8 of the company's 10 refineries and halting 70% of production. *(DJ)*
- July 6** Texaco Corporation announces plans to sell about half of its 600 producing fields in the United States and cut 2,500 jobs as part of its broad move to reduce costs. *(NYT)*
- July 8** North Korea's longtime ruler, Kim Il Sung, dies of a heart attack at the age of 82. *(DJ)*
- July 8** Yemen's 65-day-old civil war ends as Northern troops seize Aden, the southern capital. *(DJ)*
- July 11** Nigeria's largest refinery, the 125,000 b/d Warri refinery, closes due to the oil worker's strike. Members of the Petroleum and Natural Gas Senior Staff Association join the strike in Nigeria. Also, Chevron closes its Jislike oil field due to the workers' strike. *(DJ)*
- July 13** U.S. business leaders, in a delegation to India headed by Secretary of Energy Hazel O'Leary, sign 11 agreements with Indian companies for setting up joint ventures ranging from manufacture of solar panels to transferring technology for producing environmentally-clean energy. *(DJ)*
- July 13** Rolf Ekeus, chief of the U.N. Special Commission which oversaw the destruction of Iraq's weapons of mass destruction, informs UN officials that a weapons monitoring program should be in place by September, and will need about 6 months to begin functioning well. *(DJ)*
- July 19** Talks between Kazakhstan, Oman, and Russia break down and threaten to stall the \$1.3 billion Caspian Oil Pipeline project, which is slated to link the Tengiz oil field in Kazakhstan to the Russian Black Sea port of Novorossiysk. *(DJ)*
- July 21** The continuing strike in Nigeria causes Texaco Inc. to cut back its 60,000 b/d Nigerian production by about 10,000-15,000 b/d. *(DJ)*
- July 24** UN arms inspectors set up 50 monitoring cameras and scores of sensors across Iraq in a unique operation to forestall attempts by Baghdad to acquire long-range missiles. The system should be operational by September. *(DJ)*
- July 24** Yemen's 120,000 b/d Aden refinery resumes operations after being inoperable since June 1 due to civil war. Most of the damage had been in the piping and the storage tanks. *(DJ)*

- July 26** Exxon and 3,500 native Alaskans reach a \$20 million settlement of claims stemming from losses incurred as a result of the 1989 Exxon Valdez oil spill. *(WP)*
- July 28** Military authorities of Armenia, Azerbaijan, and Nagorno-Karabakh sign a pledge to observe a cease-fire in the disputed enclave of Nagorno-Karabakh. *(DJ)*
- Aug. 5** The Nigerian Labour Congress calls off a general strike in order to allow the military government to negotiate with union leaders. Oil workers remain on their month-long strike, which has cut Nigeria's oil exports by roughly 25 percent. *(DJ)*
- Aug. 5** In Algeria, several European nations take various measures, including an embassy closure, to ensure the safety of their citizens after five French government and military personnel are killed by Islamic radicals on August 3. *(NYT)*
- Aug. 6** A former Saudi Arabian diplomat claims that his country secretly attempted to buy nuclear reactors from China in an effort to acquire nuclear weapons technology. *(NYT)*
- Aug. 9** The United States resumes talks with North Korea concerning North Korea's nuclear program. North Korea asks for a modern, South Korean light-water reactor as "appropriate compensation" for canceling its construction of two nuclear reactors. *(DJ)*
- Aug. 11** A federal jury awards \$286.8 million to 10,000 Alaskan fishermen who filed suit against Exxon because of damages from the Exxon Valdez oil spill in 1989. *(WP)*
- Aug. 12** Chevron announces an increase from 30,000 b/d to 50,000 b/d in oil exports from its Tengiz oil field in Kazakhstan. *(WSJ)*
- Aug. 12** German police seize weapons-grade enriched uranium suspected to have been smuggled from a Russian nuclear power plant. This is the second such seizure this year. *(WP)*
- Aug. 15** Vietnam and China hold talks regarding border issues and oil-drilling rights in the Spratly Islands and in other disputed areas of the South China Sea. *(WT)*
- Aug. 15** Nigeria's oil output for July is estimated to have decreased 500,000 b/d from June's output of 1.94 million b/d due to the continuing oil workers' strike. *(DJ)*
- Aug. 16** Tenneco Gas is selected to work on a 2000-mile, \$2 billion pipeline project to transport natural gas from Bolivia to Brazil. *(DJ)*
- Aug. 20** Eleven former high-ranking army commanders, state governors, and legislators are arrested in Nigeria after rumors of a possible coup attempt against the incumbent military dictatorship. Riots also break out in several cities. *(DJ)*
- Aug. 21** Oman and India begin talks regarding the construction of a \$5 billion, 900-mile, underwater

- pipeline which would supply India with two billion cubic feet per day of natural gas. *(DJ)*
- Aug. 23** Iran and Turkmenistan sign an agreement to build a \$7 billion pipeline which will carry Turkmen gas through Iran and Turkey to markets in Europe. *(FT)*
- Aug. 30** British Petroleum announces a major natural gas discovery (reserves estimated at 5 tcf) near the large Cusiana oil field in Colombia. *(NYT)*
- Aug. 31** A fire breaks out at a Russian nuclear power plant in the former secret city of Chelyabinsk-65. Initial reports vary concerning the amount of radiation released. *(DJ)*
- Sept. 1** The Argentine government announces mass privatization plans which will include the sale of three nuclear power plants and the country's largest petrochemicals plant. *(CT)*
- Sept. 6** In Nigeria, more than 100,000 oil workers end their two-month long strike which has cut oil production by 29 percent, according to Nigerian Oil Minister Umar Baba. *(WSJ)*
- Sept. 8** In Angola, UNITA rebels accept a U. N. brokered peace agreement which involves a power-sharing arrangement with the Angolan government. *(DJ)*
- Sept. 9** Iraq and Russia sign a \$10-billion trade agreement related to oil and industrial projects which will take effect after the U. N. Security Council lifts its four-year old trade embargo against Iraq. *(DJ)*
- Sept. 15** British Petroleum (BP) announces that it recently discovered two large offshore natural gas fields in Vietnam with estimated recoverable reserves of over two trillion cubic feet (tcf) gas. This find follows another BP discovery last month of a five tcf gas field in Colombia. *(DJ)*
- Sept. 15** In Brazil, a consortium of Broken Hill Proprietary, Tenneco Gas, and British Gas sign \$900 million worth of natural gas projects. Last month, Tenneco won a contract to build a 2,100-mile long pipeline connecting Bolivian gas fields to Brazil's San Paulo state. *(NYT)*
- Sept. 17** Exxon Corporation is ordered by a federal court jury to pay \$5 billion to Alaskan fisherman and residents who suffered damages from the 1989 Exxon Valdez oil spill. This represents the largest punitive award ever against a corporation. *(WSJ)*
- Sept. 19** In Russia, President Boris Yeltsin signs a decree which moves up the original 1996 sale date of the government's 40 percent stake in the state-owned gas monopoly, Gazprom. *(DJ)*
- Sept. 20** A consortium of Western companies led by Amoco and British Petroleum sign a \$9 billion, 30-year contract with Azerbaijan to drill for oil in the Caspian Sea. The targeted Azeri and Chirag fields have estimated proven reserves of at least three billion barrels. The Russian Ministry of Foreign Affairs issues a statement which says that it "shall not officially

- recognize" the Caspian Sea oil deal, which Azerbaijan signed the previous day because Russia was not involved in the negotiations. *(DJ)*
- Sept. 20** The Saudi Arabian government arrests hundreds of Islamic fundamentalists in an effort to deter the spread of Islamic extremism in the country. Most of the arrests take place in the northwestern university city of Buraydah. *(DJ)*
- Sept. 22** At the annual meeting of the IAEA in Vienna, Austria, 40 countries sign the Convention on Nuclear Safety. The convention will create an international regulatory and legislative framework for the operation of nuclear power plants. *(DJ)*
- Sept. 25** U.S. Energy Secretary Hazel R. O'Leary, accompanied by 50 U.S. corporate executives, concludes four days of talks in Pakistan aimed at strengthening ties between the two countries. Over \$4 billion worth of energy-related agreements are signed. *(WSJ)*
- Sept. 27** More than 50,000 Brazilian oil workers begin a strike which stops drilling operations and suspends all gasoline exports, including 50,000 b/d to the United States. The workers are striking for a 110 percent pay raise. *(DJ)*
- Sept. 30** Two freighters carrying highly enriched uranium from European nuclear reactors arrive at the Department of Energy's radioactive storage site in Savannah River, Georgia. *(WP)*
- Oct. 3** In Azerbaijan, President Heydar Aliyev declares a state of emergency after a coup attempt led by Prime Minister Surat Huseynov and the Special Police Force. *(DJ)*
- Oct. 6** Venezuelan officials state their government's intent to sell Planta Centro de Venezuela, the largest thermal electric plant in Latin America, for an anticipated \$800 million by the end of November 1994. *(DJ)*
- Oct. 6** Brazilian oil workers return to work after a week-long strike which stopped Brazil's production in the 500,000 b/d Campos Basin and halted its gasoline exports. *(DJ)*
- Oct. 10** U.S. troops begin arriving in Kuwait to reinforce the Kuwaiti border following a sudden Iraqi military build-up in which over 60,000 soldiers and heavy armor move to within 20 miles of the Kuwaiti border. *(DJ)*
- Oct. 13** British Gas and Amoco announce plans to proceed with a \$1.5 billion liquefied natural gas project in the offshore fields near Trinidad. Approximately half of the projected 400 million cubic feet of gas produced is planned for export to the United States. *(DJ)*
- Oct. 13** Indonesia's state oil-company, Pertamina, announces an agreement to extend contracts to supply liquified natural gas (LNG) to Japan. Pertamina will supply Japan with 12 million tons of LNG through 2009. *(DJ)*
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- Oct. 13** The five nations bordering the Caspian Sea (Turkmenistan, Kazakhstan, Iran, Azerbaijan, and Russia) sign an accord which stresses mutual cooperation and development with respect to the Sea's natural resources. The agreement comes after Azerbaijan signed a \$9 billion Caspian Sea oil development contract with Western companies in September 1994. *(DJ)*
- Oct. 14** Energy ministers from Algeria, Morocco, Spain, and Portugal attend a groundbreaking ceremony for construction of the \$2.5 billion Trans-Maghreb natural gas pipeline. When completed, the pipeline will supply Europe with 350 billion cubic feet of gas per year. *(EC)*
- Oct. 16** In Vietnam, Broken Hill Proprietary begins production in the offshore Dai Hung oil field. The field is estimated to hold up to 500 million barrels of recoverable reserves. *(DJ)*
- Oct. 18** The Nigerian National Petroleum Corporation announces that Nigerian oil production reached its previous OPEC quota level of 1.865 million b/d in mid-September following the conclusion of an oil workers strike in July and August 1994. *(DJ)*
- Oct. 18** A reactor at the Ukrainian Chernobyl nuclear power plant leaks an unspecified amount of radioactive water. *(DJ)*
- Oct. 21** An accord is signed between the United States and North Korea which provides a 10-year timetable for North Korea to dismantle its nuclear program. Also, under the accord the United States will provide North Korea with \$4 billion in economic assistance. *(NYT)*
- Oct. 21** Colonial Pipeline Company's main pipeline, which transports gasoline from the U.S. Gulf Coast to markets in the northeast, breaks during flooding and spills an estimated 400,000 gallons of gasoline. *(WSJ)*
- Oct. 25** In the northern Komi region of Russia, press reports state that a dam holding oil from a September 1994 pipeline rupture burst on October 1 following heavy rains, spilling between 100,000 to 2.2 million barrels of oil. *(NYT)*
- Oct. 27** In Turkmenistan, President Saparmurat Niyazov and Iranian President Rafsanjani celebrate the start of a \$7 billion, 1000-mile natural gas pipeline project which will carry Turkmeni gas through Iran to Turkey. *(WT)*
- Oct. 31** In Ecuador, Gustavo Galindo is appointed the new Minister of Energy and Mines. The former minister, Francisco Acosta, was impeached on October 21 due to accusations that he compromised Ecuador's best interests during negotiations with foreign oil companies. *(DJ)*
- Nov. 2** In Egypt, more than 200 people are killed in the southern village of Durunka as fuel tanks at a military complex explode during heavy floods. *(NYT)*
- Nov. 2** In Algiers, at least 14 people are killed during a shootout between police and Islamic militants advocating the overthrow of the Algerian government. The gun battle took place during the midst of police negotiations to obtain the release of hostages. *(WP)*

- Nov. 7** Iran fires four Scud missiles and launches air attacks on the Mujahedin Khalq Organization (MKO) base at Ashraf, 50 miles into Iraqi territory. This action follows two car bombings in southern Tehran on November 6. Iran accuses the MKO of recently attempting to sabotage Iranian pipelines in the Mousian oil-producing region. *(WP)*
- Nov. 8** The World Bank approves a \$110 million loan to clean up pollution in rivers, toxic waste dumps, and industrial sites in Russia. *(NYT)*
- Nov. 10** Iraq officially recognizes Kuwait and its territorial integrity. This announcement follows the October 1994 build-up and subsequent withdrawal of Iraqi troops on the Kuwaiti border. Four days later, the U.N. Security Council renews its commercial sanctions against Iraq during the Council's regular 60-day review. *(WSJ)*
- Nov. 13** Three hijackers who commandeered an Air Algeria passenger plane surrender after forcing the plane to fly to Mallorca, Spain. The hijackers had demanded that the Algerian government release political prisoners and hold national elections. *(WT)*
- Nov. 16** Exxon signs a \$40 billion agreement with Indonesia to develop the giant Natuna natural gas field. Estimated recoverable reserves are 45 tcf. *(WSJ)*
- Nov. 17** The Ukrainian parliament ratifies the nuclear Non-Proliferation Treaty. Shortly thereafter, Ukraine is pledged \$200 million in aid from U.S. President Clinton. *(FT)*
- Nov. 20** The Angolan Government and the UNITA rebel group sign a peace treaty which ends the 19-year civil war. The signing was preceded by government offensives in the northern oil town of Soyo and in Huambo, which is the site of UNITA's headquarters. *(NYT)* *(Editor's note: Angola exports about 300,000 b/d of oil to the United States)*
- Nov. 21** In Canada, Quebec decides to postpone indefinitely its \$9.6 billion, 3,100 megawatt Great Whale hydroelectric project. The project was a source of environmental controversy because the Great Whale River and its watershed would have been dammed. *(FT)*

- Nov. 22** OPEC leaders agree to maintain the Organization's current output ceiling of 24.52 million b/d through 1995. The decision was made over objections from Kuwait, Libya, and Gabon. *(FT)*
- Nov. 23** In Brazil, Petrobras' oil workers begin striking to demand a 108 percent pay increase. A similar strike was staged in September 1994, but it ultimately did not resolve workers' demands. In an apparent effort to shore-up oil stocks, the Brazilian government announces a 15 percent tax on all petroleum and chemical exports as well as a concurrent lowering of import tariffs on those commodities. *(FT)*
- Nov. 23** Approximately 1,320 pounds of highly enriched uranium 235 arrives in the United States after being flown from Kazakhstan as part of a transfer agreement between the two countries. *(BS)*
- Nov. 25** Egypt Gas forms a \$150 million joint venture with Amoco and Italian ENI to build a 150-mile gas pipeline from Port Sa'id to Israel. Construction could begin next year. *(FT)*
- Nov. 25** The Japanese Government announces that it has stockpiled almost 24,000 pounds of plutonium for use in its nuclear power industry. *(WT)*
- Nov. 26** Russia's state-owned gas monopoly, Gazprom, announces that it will sell nine percent of its shares to foreign investors by the end of 1994. *(NYT)*
- Nov. 30** Apache Corporation agrees to purchase over 300 of Texaco's oil and gas fields in the United States. The deal is worth a reported \$600 million. *(WSJ)*
- Dec. 2** Azerbaijan's parliament passes a law which "guarantees the implementation" of the \$9 billion Caspian Sea oil deal signed with a consortium of Western companies in September 1994. A month earlier, Russia's Energy Minister had declared his country's "obligation" to take part in all energy projects in the Commonwealth of Independent States. *(DJ)*
- Dec. 6** France restarts its \$6 billion Superphenix fast-breeder reactor after four years of repairs. The controversial reactor, which generates electricity and produces plutonium fuel, was shut down two weeks later because of argon gas leaks. *(WP)*
- Dec. 7** The United States delivers a letter to the U.N. Security Council regarding "evidence of Iranian complicity in the smuggling of Iraqi petroleum through Persian Gulf ports in violation of U.N. Security Council resolutions prohibiting such trade." *(WP)*
- Dec. 11** Russia sends an estimated 40,000 troops into the break-away republic of Chechnya to restore order and disarm "illegal armed groups." Azerbaijan's primary oil export pipeline to the Russian port of Novorossiysk runs through Chechnya. The republic also contains a gas processing plant and two oil refineries with a combined capacity of 430,000 b/d. *(DJ)*
- Dec. 12** Yemen's Interior Minister Yehya al-Mutawakil states that his country's border troops skirmished with Saudi Arabian forces for four days during the week of December 5. The

conflict was sparked by Yemen's accusation that Saudi Arabia had built roads and border posts in Yemeni territory. Saudi Arabia said construction took place on its land. The area in question is part of a long-running border dispute between the two countries. *(DJ)*

- Dec. 12** Turkey closes the Dardanelles Straits temporarily after a collision between a Greek Cypriot oil tanker and a Greek freighter. No casualties or oil spills were reported. In 1994, Turkey established new navigation regulations and installed a radar system to help prevent accidents in the 1.6 million b/d oil shipping corridor. *(DJ)*
- Dec. 14** In Nigeria, a large petroleum products depot in the city of Enugu is destroyed by fire. The distribution facility supplied gasoline, kerosene, and other products to eastern Nigeria. The country's military government suspects sabotage by pro-democratic activists. *(DJ)*
- Dec. 20** The British government approves the Britannia gas field's \$2.5 billion development. Britannia is the country's largest undeveloped gas field and is located offshore of Aberdeen, Scotland. Production is expected to begin in 1998 after the construction of a 120-mile pipeline to bring the gas onshore. Conoco is the largest partner in the development team. *(FT)*
- Dec. 20** A currency crisis erupts in Mexico after Finance Secretary Jaime Serra Puche announces that the government no longer has the foreign reserves necessary to keep the peso traded in a band pegged to the U.S. dollar. *(WSJ)*
- Dec. 22** The Chinese government announces the start of construction on the world's largest hydroelectric power project. The \$17-billion Three Gorges Dam project will involve the relocation of one million people and is slated for completion in 2009. *(NYT)*
- Dec. 24** In Algeria, four Islamic militants hijack a French Airbus A300 and kill three of the 239 passengers and crew. The Armed Islamic Group, which later claimed responsibility for the hijacking, has engaged the Algerian government in a 3-year civil war in which over 11,000 people have died. *(DJ)*
- Dec. 25** Gustavo Galindo, Ecuador's Energy Minister, is killed in a car accident. Galo Abril, who is named as his successor, becomes Ecuador's fifth Energy Minister since 1992. *(DJ)*
- Dec. 29** Peruvian Indians file a \$1 billion class action lawsuit against Texaco, charging that the company dumped millions of gallons of oil from its Ecuadorean production operations into a river which flows into Peru. In early 1994, Texaco settled another suit with the Ecuadorean government, which alleged environmental damage in the Amazon Basin. *(WSJ)*