

COUNTRY ANALYSIS BRIEFS

Oman

Last Updated: April 2007

Background

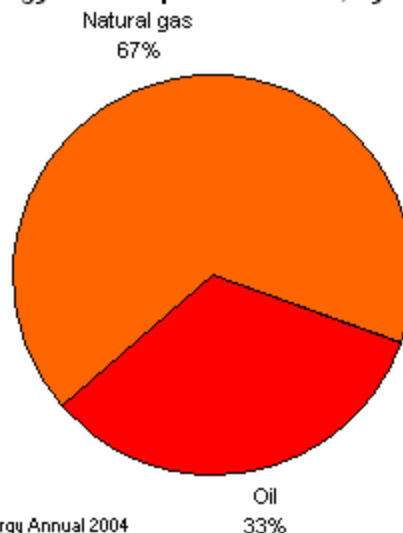
Oman is a significant non-OPEC oil exporter, although production has declined in recent years.

Oman's economy is heavily reliant on oil revenues, which account for about 75 percent of the country's export earnings and 40 percent of its gross domestic product (GDP). During 2006, Oman's real GDP grew at an estimated rate of 4.2 percent, down from 5.7 percent in 2005. The slowdown in economic growth occurred largely as a result of declining oil production in Oman. To help offset these declines, the government has devoted considerable resources to new exploration and production activities, enhanced oil recovery projects, and introduced policies aimed at diversifying the country's economy away from the oil sector. The development of natural gas reserves in Oman is a central part of this effort, and natural gas production is likely to expand considerably during the next several years.

All of Oman's domestic energy consumption is supplied by natural gas and oil, reflecting the country's relative abundance of oil and natural gas reserves.



Total Energy Consumption in Oman, by Type (2004)



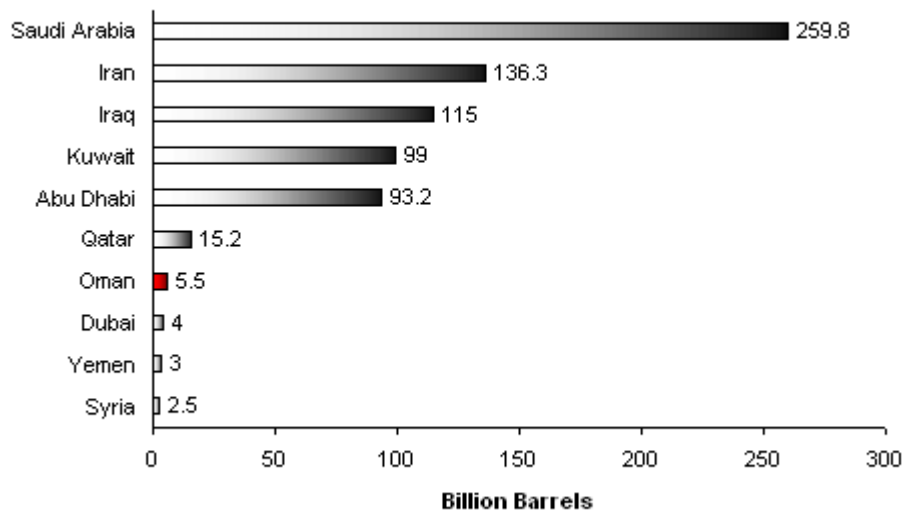
Source: EIA International Energy Annual 2004

Oil

Oman has undertaken enhanced oil recovery projects at the country's mature oil fields to help offset recent declines in oil production.

According to *Oil & Gas Journal (OGJ)*, proven oil reserves in Oman stood at 5.5 billion barrels as of January 2007. Oman's petroleum deposits were discovered in 1962, decades after most of those of its neighbors. Moreover, Oman's oil fields are generally smaller, more widely scattered, less productive, and pose higher production costs than in other Persian Gulf countries. The average well in Oman produces only around 400 barrels per day (bbl/d), about one-tenth the volume per well of those in neighboring countries. To compensate, Oman uses a variety of enhanced oil recovery (EOR) techniques.

Selected Middle East Proven Oil Reserves, Jan. 1, 2007



Source: Oil & Gas Journal, Jan. 1, 2007

Oman's oil production has declined during the last 6 years. Oman produced an estimated 743,000 bbl/d of total oil liquids in 2006, about 5 percent less than 2005 levels. Of the country's 2006 output, 676,000 bbl/d was crude oil, 61,000 bbl/d was lease condensate, and the remainder consisted of natural gas plant liquids. EIA forecasts that the Oman's oil production will continue to decline in 2007 and 2008, with 2008 output dropping to 690,000 bbl/d, or 7 percent less than 2006 levels.

During 2006, Oman consumed an estimated 64,000 bbl/d of oil, with net exports of 679,000 bbl/d. Oman is not a member of the Organization of the Petroleum Exporting Countries (OPEC), though it is a significant exporter of oil. Most of Oman's crude oil exports go to Asian countries, with China, India, Japan, South Korea, and Thailand the largest importers.

Sector Organization

Petroleum Development Oman (PDO), which is 60 percent owned by the Omani government, accounts for more than 90 percent of the country's oil reserves and 85 percent of production. Aside from the government, the PDO consortium includes Shell (34 percent), Total (4 percent), and Partex (2 percent). While private companies hold equity stakes in PDO, the company is controlled by the state through Oman's oil ministry. Although PDO is the leading oil producer in Oman, several foreign companies are also involved in upstream activities, with Occidental Petroleum holding the largest market share.

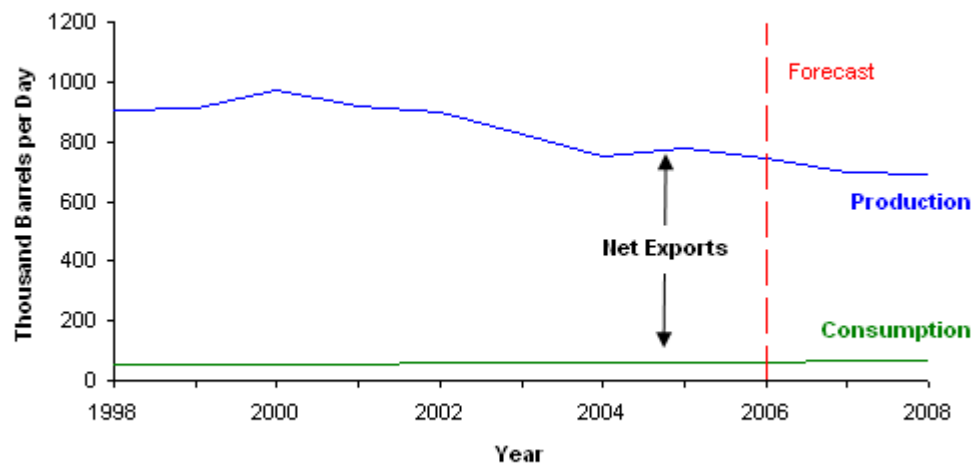
Oman's government manages its investments in the downstream sector through the state-owned Oman Oil Company (OOC). The company was established in 1992 as a government-owned vehicle to pursue energy sector investments domestically and abroad. OOC's operations are financed by funds from the State General Reserve Fund (SGRF), which uses oil revenues to help diversify Oman's economy.

Oman's Ministry of Oil and Gas (MOG) coordinates the state role in the country's hydrocarbons sector, although all energy sector developments must receive approval from the Sultan of Oman.

Exploration and Production

To help offset declining oil output, Oman's Minister of Oil and Gas announced in April 2006 that the country planned to invest \$10 billion in upstream oil and natural gas projects during the next five years. Much of this effort will focus on enhanced oil recovery (EOR) initiatives to improve recovery rates at several of the country's oil fields. Oman also plans to increase exploration and production (E&P) activities, although the natural gas sector will receive much of this investment.

Oman's Oil Production and Consumption, 1998-2008*



Source: EIA International Energy Annual 2004;
Short-Term Energy Outlook (March 2007)

*2006 is estimate

Enhanced Oil Recovery Projects

There are numerous EOR projects in the pipeline that are expected to increase recovery rates at several of Oman's oil fields. The largest of these efforts is at Occidental Petroleum's onshore Mukhaizna field, which the company acquired from PDO in 2005. Occidental plans to invest \$3 billion to increase output from 10,000 bbl/d to 50,000 bbl/d in 2008, and then to a peak of 150,000 bbl/d by 2012. PDO is also engaged in several EOR schemes, most notably at the Harweel field, where it hopes to increase output from 18,000 bbl/d to 70,000 bbl/d by the end of 2009. Other planned EOR projects by PDO are Qarn Alam, Marmul, and Fahud.

Oman's long-term oil output targets rely heavily upon the success of these and other planned EOR projects. The Mukhaizna development plan involves a relatively new EOR process that seeks to use steam flooding to help recover heavy, viscous oil reserves that are not easy to recover using conventional methods. Not only is this costly, the technique uses large amounts of water, which is relatively expensive and scarce in the Persian Gulf. In addition, EOR schemes use substantial natural gas as a feedstock. This has led Oman to redirect some of its natural gas supplies that it had designated for export to use at EOR projects around the country.

Pipelines and Export Terminals

Oman's pipeline system is mostly focused on delivering crude oil to the country's only oil export terminal at Mina al-Fahal, near the capital Muscat. PDO operates the Mina al-Fahal facility, as well as the Main Oil Line that runs to the export terminal. PDO operates approximately 1,000 miles of oil pipelines throughout the country, according to industry sources.

Downstream Activities

According to *OGJ*, Oman had 85,000 bbl/d of refining capacity at one plant, the state-owned Oman Refinery Company's (ORC) facility at Mina al-Fahal. ORC is currently upgrading the refinery to boost its capacity to 107,000 bbl/d, which the company expects to complete in 2007. In October 2006, operations reportedly started at a second refinery near Sohar, owned by the Sohar Refinery Company (SRC), which is 80 percent-owned by Oman's Ministry of Finance and 20 percent-owned by OOC. The SRC plant is expected to reach peak capacity of 116,000 bbl/d in 2007. When initially designed, the SRC envisioned sending about 80 percent of the refinery's output to export markets, although the company has reconsidered this as domestic demand for petroleum products in Oman has risen.

Oman is currently considering building a large refinery and petrochemical complex at Al Duqm in southern Oman, which would be geared toward export markets. The government received bids for the complex's front-end engineering and design (FEED) contract in February, and is expected to award the contract in mid-2007. Under current plans, a joint venture of the Omani government and international investors would build a 200,000–300,000-bbl/d refinery, a crude oil export terminal, and several large petrochemical facilities. If the government proceeds with this plan, construction is expected to get underway at the end of 2008, with commercial production scheduled for 2012.

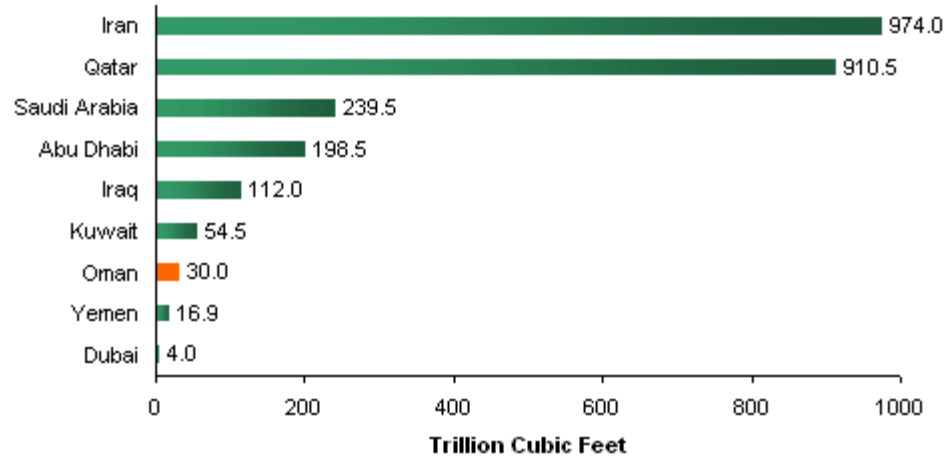
Natural Gas

Oman exports significant amounts of liquefied natural gas, although the country faces increasing domestic natural gas requirements.

According to *OGJ*, Oman's proven natural gas reserves stood at 30 trillion cubic feet (Tcf) as of January 2007. Expanding natural gas production has become a chief focus of Oman's strategy to diversify its economy away from the oil sector. Rising natural gas production over the last several years has resulted in the expansion of natural gas-based industries, such as petrochemicals, power generation, and the use of natural gas as a feedstock for enhanced oil recovery projects. However, despite the recent rise in production, additional natural gas reserves have not been located as quickly as the government had hoped. Some industry sources have speculated that, given the country's long-term liquefied natural gas (LNG) export obligations, natural gas supplies may be overcommitted in Oman.

Natural gas production in Oman stood at 607 billion cubic feet (Bcf) in 2004, up more than three-fold since 1999. Oman consumed 239 Bcf of natural gas in 2004, with LNG exports of 324 Bcf. Nearly two-thirds of Oman's LNG exports went to South Korea, while the remainder went to Japan, Taiwan, Spain, France, and the United States. Oman also pipes some natural gas exports to the United Arab Emirates (UAE), although it has plans to import natural gas in the future.

Selected Middle East Proven Natural Gas Reserves, Jan. 1, 2007



Source: Oil & Gas Journal, Jan. 1, 2007

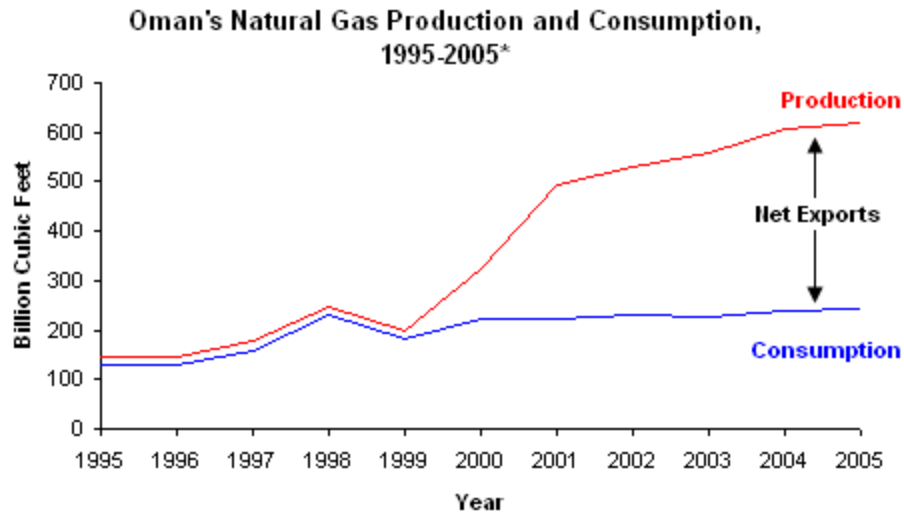
Sector Organization

State-owned companies dominate Oman's natural gas sector. However, the government has increasingly enlisted foreign companies in new exploration and production projects, especially in the more geologically complex natural gas reservoirs, where BG and BP were recently awarded Production Sharing Contracts (PSCs). PDO remains the leading player in the upstream natural gas sector, while other foreign companies such as Indago Petroleum, Occidental Petroleum, and Thailand's PTTEP also have a share of the upstream market.

The Oman Oil Company (OOC) directs state investment in downstream projects through such subsidiaries as the Oman Gas Company (OGC), which operates the country's natural gas transmission and distribution lines. LNG activities are primarily carried out by the Oman Liquefied Natural Gas Company (OLNGC), a consortium led by the central government (51 percent equity), Shell (30 percent), and several other foreign companies. OLNGC owns two of Oman's LNG production trains and has a 40 percent stake in the third LNG facility.

Exploration and Production

Natural gas production has risen significantly since 1999, although increases in production have tapered off during the last two years. The Omani government has intensified its efforts to locate additional natural gas supplies to help meet rising domestic natural gas requirements as well as the country's LNG export commitments.



Source: EIA International Energy Annual 2004;
CEDIGAZ Natural Gas in the World 2005

*2005 is estimate

In February 2007, PTTEP started commercial production at the Shams field in Block 44 at an initial rate of 50 million cubic feet per day (MMcf/d). The company hopes to increase production at the site in the future if additional reserves are located. PDO is currently working on several exploration and production (E&P) projects, and hopes to increase natural gas production significantly over the next decade. PDO is currently building a new natural gas processing plant to pump supplies from its Kauther field project. The processing station will have the capacity to produce 700 MMcf/d, although the Kauther field will most likely produce at a rate between 500 – 550 MMcf/d, according to company estimates. The Kauther project will significantly enhance Oman's natural gas production capacity, with much of the supplies feeding enhanced oil recovery projects.

Whether or not Oman is able to significantly increase natural gas production in the future hinges on the successful development of "tight" natural gas reservoirs, which are geologically complex structures considered much more difficult to access than conventional natural gas reserves. The Khazzan/Makarem tight natural gas fields were originally discovered in 1993, but have remained undeveloped. In January 2007, BP signed a Production Sharing Contract (PSC) for Khazzan/Makarem, and will carry out appraisal work over the next three years to judge the fields' potential. BP representatives have stated that the two fields could potentially yield between 20 and 30 Tcf. Another tight natural gas project with large potential is the Abu Butabul field, for which BG signed a PSC in 2006. BG says that the field holds probable natural gas reserves of 5 - 8 Tcf, although advanced seismic and drilling tests are not expected to be completed until mid-2007. These projects have the potential to significantly expand natural gas resources in Oman, although each field poses technical challenges and may prove costly to develop.

Pipelines

Domestic System

Oman's domestic natural gas pipeline system is controlled by the Oman Gas Company, although OGC has contracted the management of the network to a consortium of private companies. Oman's natural gas network spans about 1,100 miles, bringing supplies from production centers to the country's LNG terminals, power plants, and other domestic end users.

International Connections

Oman is part of the Dolphin Project, which aims to connect the natural gas networks of Qatar, the United Arab Emirates (UAE), and Oman. The Dolphin Project will eventually send supplies from natural gas-rich Qatar to the UAE and Oman, which facing rising domestic natural gas demand. While Oman will import natural gas from the Dolphin Project in the future, it currently exports about 175 MMcf/d of piped natural gas to the UAE via two pipelines. However, one line, which sends about 135 MMcf/d to a power plant in the UAE, will be reversed starting in 2008 when Qatari natural gas through the Dolphin line is available. Oman has contracted to buy 200 MMcf/d of natural gas from Qatar beginning in 2008, most of which will be used as feedstock at Occidental's enhanced oil recovery project at the Mukhaizna field (see the [Qatar](#) and [UAE](#)

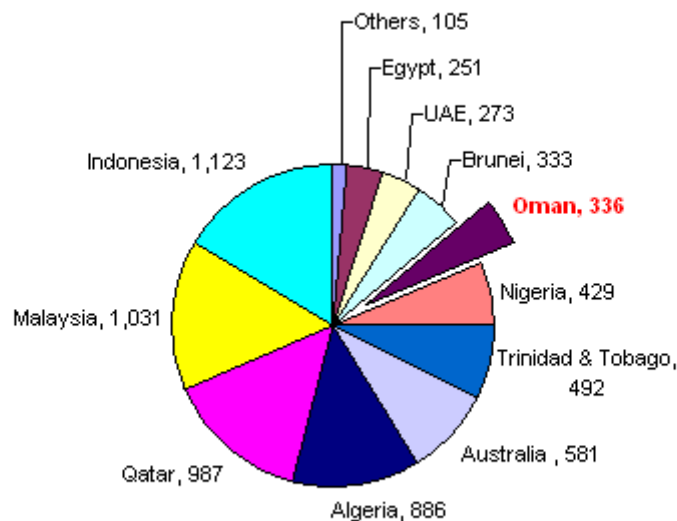
[Country Analysis Briefs](#) for more information).

Oman has also discussed the possibility of importing natural gas from Iran, although there are currently no firm plans to build such a pipeline (see the [Iran Country Analysis Brief](#) for more information).

Liquefied Natural Gas

During 2005, Oman exported 6.9 million metric tons (MMt, or about 336 Bcf) of LNG. Of this total, 4.3 MMt (209 Bcf) went to South Korea, 1.2 MMt (58 Bcf) to Spain, 1.1 MMt (54 Bcf) to Japan, and small amounts of LNG went to France, India, Taiwan, and the United States. Oman has three LNG production trains with total annual liquefaction capacity of about 10 MMt (485 Bcf). OLNCG operates two production trains with a combined capacity of 6.6 MMt (322 Bcf). The newest LNG plant was built by Qalhat LNG, a consortium that includes the Omani government (52 percent), OLNCG (40 percent), and Spain's Union Fenosa Gas (8 percent). The Qalhat LNG unit started commercial operations in early 2006 and has a capacity of 3.3 MMt (161 Bcf). Industry sources report that upwards of 30 percent of Oman's liquefaction capacity currently sits idle, as the country has been reluctant to sign additional LNG supply deals in light of increasing domestic natural gas requirements.

Global LNG Exports, by Origin, 2005 (Bcf)



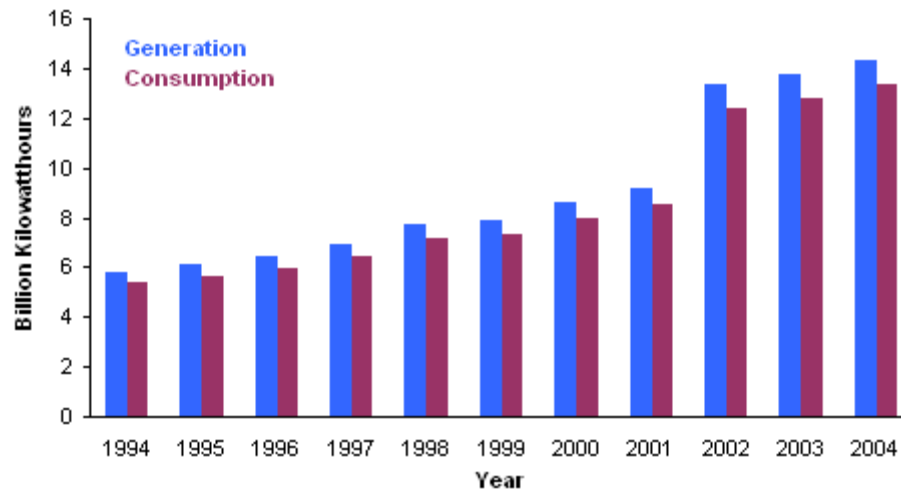
Source: EIA Natural Gas Monthly (Aug. 2006); IEA Natural Gas Information 2006

Electricity

Oman has set out to privatize much of its electricity sector.

In 2004, Oman had 3.3 gigawatts (GW) of installed electric generating capacity, all of which came from conventional thermal sources. During 2004, Oman generated 14.3 billion kilowatthours (Bkwh) of electricity while consuming 13.3 Bkwh. Oman hopes to expand electric generating capacity in the future to support rising domestic demand and industrial growth. The government has set a goal to privatize all state-owned companies in the power sector by 2009, and the country has courted international investors to finance new independent power projects (IPP) to help raise generation capacity. Oman's Ministry of Housing, Electricity, and Water (MHEW) has primary regulatory authority in the power sector and is responsible for electricity distribution throughout the country.

Oman's Electricity Generation and Consumption, 1994-2004



Source: EIA International Energy Annual 2004

Profile

Country Overview

Chief of State	Sultan Qaboos bin Said al Said
Location	Middle East, bordering the Arabian Sea, Gulf of Oman, and Persian Gulf, between Yemen and UAE
Population (July 2006E)	3,102,299 (note: includes 577,293 non-nationals)

Economic Overview

Minister of Commerce and Industry	Maqbool bin Ali Sultan
Currency/Exchange Rate (April 6, 2007)	1 USD = 0.385 Omani Rial (OMR)
Inflation Rate (2006E)	3.2%
Gross Domestic Product (2006E)	\$38.8 billion
Real GDP Growth Rate (2006E)	4.2%
Exports (2006E)	\$23.5 billion
Exports - Commodities	petroleum, reexports, fish, metals, textiles
Exports - Partners (2005E)	China 21.6%, South Korea 19.4%, Japan 14.2%, Thailand 12.6%, UAE 7.1%, Taiwan 4.1%
Imports (2006E)	\$13.0 billion
Imports - Commodities	machinery and transport equipment, manufactured goods, food, livestock, lubricants
Imports - Partners (2005E)	UAE 22.4%, Japan 15.8%, UK 7.7%, US 6.7%, Germany 5.8%, India 4.2%

Energy Overview

Minister of Oil and Gas	Muhammad bin Hamad bin Sayf al-Rumhi
Proven Oil Reserves (January 1, 2007E)	5.5 billion barrels
Oil Production (2006E)	743,000 barrels per day, of which 91% was crude oil.
Oil Consumption (2006E)	64,000 barrels per day

Crude Oil Distillation Capacity (January 1, 2007E)	85,000 barrels per day
Proven Natural Gas Reserves (January 1, 2007E)	30 trillion cubic feet
Natural Gas Production (2004E)	607 billion cubic feet
Natural Gas Consumption (2004E)	239 billion cubic feet
Recoverable Coal Reserves (2004E)	None
Coal Production (2004E)	None
Coal Consumption (2004E)	None
Electricity Installed Capacity (2004E)	3.3 gigawatts
Electricity Production (2004E)	14.3 billion kilowatt hours
Electricity Consumption (2004E)	13.3 billion kilowatt hours
Total Energy Consumption (2004E)	0.4 quadrillion Btus*, of which Natural Gas (67%), Oil (33%)
Total Per Capita Energy Consumption (2004E)	128.7 million Btus
Energy Intensity (2004E)	12,332 Btu per \$2000-PPP**

Environmental Overview

Energy-Related Carbon Dioxide Emissions (2004E)	23.3 million metric tons, of which Natural Gas (63%), Oil (37%)
Per-Capita, Energy-Related Carbon Dioxide Emissions (2004E)	8.0 metric tons
Carbon Dioxide Intensity (2004E)	0.8 Metric tons per thousand \$2000-PPP**
Environmental Issues	rising soil salinity; beach pollution from oil spills; very limited natural fresh water resources
Major Environmental Agreements	Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, Ship Pollution, Whaling

Oil and Gas Industry

Organization	Petroleum Development Oman (PDO) controls all oil and natural gas resources. PDO is a partnership between the Omani government (60%), Royal Dutch/Shell (34%), Total (4%), and Partex (2%). Oman Oil Company (OOC) is the investment arm of the Ministry of Petroleum.
Major Oil/Gas Ports	Mina al-Fahal
Selected Foreign Company Involvement	BG, BP, CNPC, Indago Petroleum, Occidental Petroleum, Partex, PTTEP, Shell, Total
Major Oil Fields	Yibal, Qarn Alam, Athel-Marmul, Bahja-Rima-Jalmud, Nimr, Karim Cluster, Harweel Cluster, Mukhaizna, Safah
Major Refineries (capacity)	Mina al-Fahal (85,000 bbl/d)

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.
 **GDP figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

Links

U.S. Government

[CIA World Factbook - Oman](#)

[State Department Background Note – Oman](#)

[State Department Consular Information Sheet - Oman](#)
[U.S. Embassy in Muscat, Oman](#)

Foreign Government Agencies

[Oman Embassy in the U.S.](#)
[Ministry of Commerce and Industry](#)
[Ministry of Housing, Electricity, and Water](#)
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Oil and Natural Gas

[Dolphin Energy](#)
[Occidental Petroleum in Oman](#)
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[Oman Refinery Company](#)
[Petroleum Development Oman](#)
[Shell Oman Marketing Company](#)
[Sohar Refinery Company](#)

Sources

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APS Review of Gas Market Trends
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CEDIGAZ
CIA World Factbook
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Platts Commodity News
Platts Oilgram News
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