

COUNTRY ANALYSIS BRIEFS

Oman

Last Updated: February 2011

Background

Oman is the leading regional non-OPEC oil exporter.

Like most of its neighbors, Oman is dependent upon its oil sector for the majority of its export revenues and budgetary requirements. Oman possesses the largest oil reserves of any non-OPEC country in the Middle East and significant reserves of natural gas, of which it is a leading exporter regionally. Exports of natural gas have diversified the economy away from oil, but Oman will remain highly dependent on its hydrocarbon sectors for the foreseeable future. Oman is pursuing economic diversification, however its industrialization program is itself reliant upon increased volumes of petroleum and natural gas as feedstock. This leaves Oman's efforts to expand its economy largely dependent on the sectors from which it is attempting to diversify.

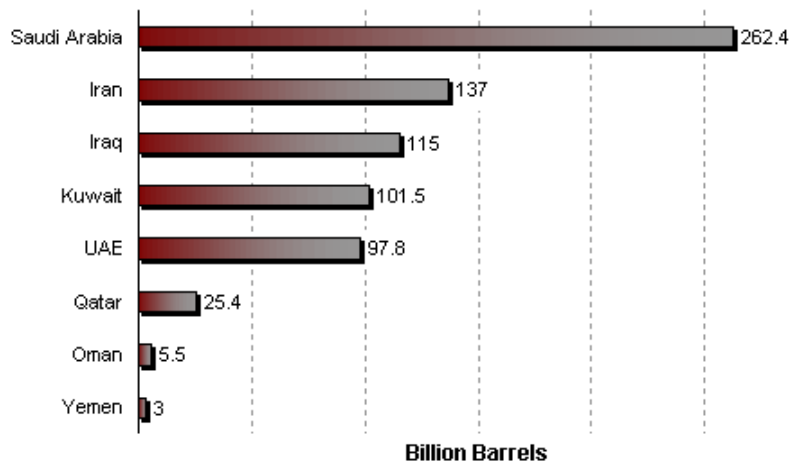


Oil

Oman has thus far implemented a successful program to reverse the decline in production, deploying some of the most sophisticated methods of oil extraction.

According to Oil & Gas Journal, Oman has total proven reserves of 5.5 billion barrels of oil. Oman's reserves are found mainly in the north and central onshore areas, comprised of disparate clusters of smaller fields. This geological composition makes production costs some of the highest in the region. The transition into secondary and tertiary extraction techniques will only increase these costs even further. Oman has thus far implemented a successful program to reverse the decline in production experienced for most of the past decade, deploying some of the most sophisticated methods of oil extraction.

Selected Middle East Proven Oil Reserves, Jan. 1, 2011



Source: Oil & Gas Journal

Sector Organization

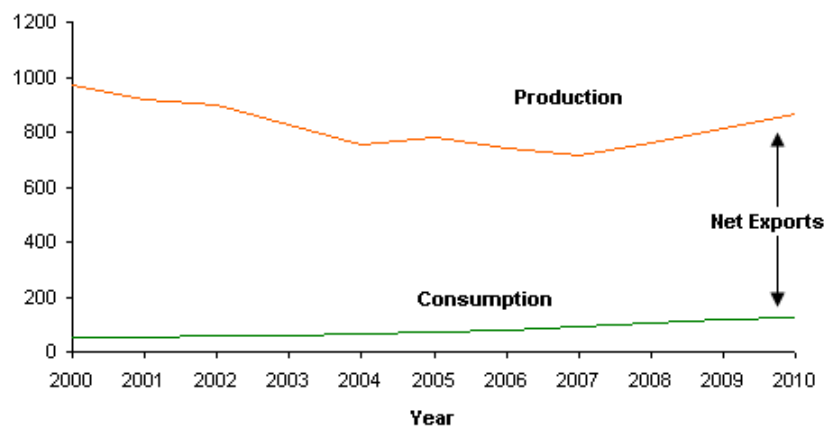
Oman's Ministry of Oil and Gas coordinates the state's role in the country's hydrocarbon sectors. Final approval on policy and investment, however, rests with the sultan of Oman, Qaboos bin Said, who also holds the office of prime minister. The implementation of oil policy is done through an integrated company in which the Sultanate of Oman owns majority stakes. Petroleum Development Oman (PDO) holds for more than 90 percent of Oman's oil reserves and is responsible for 80 percent of its production. Aside from the government's 60 percent share, Shell (34 percent), Total (4 percent), and Portugal's Partex (2 percent) all own stakes in PDO.

Given the technical difficulties involved in production, the contract terms for international oil companies (IOCs) have become more favorable than elsewhere in the region, some allowing significant equity stakes in certain projects. Occidental Petroleum has the largest presence of any foreign firm and is the second largest oil-producer in Oman. Other major players with interests in Oman include: Shell, Total, Partex, BP, CNPC, KoGas, and Repsol. In 2010, BG quit Oman because of inadequate findings in exploration at its concession areas.

Production

Oman produced 863,000 barrels per day (bbl/d) of total petroleum liquids in 2010, 860,000 bbl/d of which was crude oil. Average oil production in Oman has increased by over 20 percent for the past three years, from a low of 714,000 bbl/d in 2007. PDO owns a concession which previously encompassed most of the country, Block-6, which has since been broken up and parceled out in successive bidding rounds. Much of the production growth has come from the success of international firms in developing former portions of Block-6. Tethys Oil of Sweden in particular has received encouraging results, hitting oil at various wells in two of its onshore blocks in 2010, which could indicate a higher potential for sustained production levels.

Omani Oil Production and Consumption, 2000-2010*



Source: EIA International Energy Annual

*2010 Consumption Estimate

In 2002, PDO initiated a review of its mature oil fields to determine the feasibility of enhanced oil recovery (EOR) techniques which would help boost production yet again. A massive EOR program was implemented, using varied techniques on a field-by-field basis, according to the geology. The future of Oman's oil sector is now dependent upon these EOR techniques.

Oman's EOR program consists of three different general methods of extracting oil, some of which have never been used on a commercial scale previously. Miscible gas injection, steam (thermal) injection, and polymer flooding are the cornerstone of Oman's efforts to step up production. Miscible gas injection involves pumping gas, often toxic, that dissolves in the oil, facilitating higher flow rates. PDO is using this method at its operations in the Harweel oil field cluster. Thermal EOR methods are being deployed at Mukhaizna, Marmul, Amal-East, Amal-West and Qarn Alam fields. Thermal EOR entails the injection of steam in various ways and durations so as to facilitate the flow of heavier oil to the well. Mukhaizna has already increased production to 50,000 bbl/d, with Occidental expecting that to rise to 150,000 bbl/d by 2012. When reservoirs contain heavier grades of crude, the viscosity of the oil restricts its flow to the well. With such a heavy grade of crude, water injection might not prove effective, as the disparity in viscosity causes the water to pass the oil, instead of pushing it to the well. At projects such as Marmul, with this heavy oil, injecting polymer fluid is more effective when injected into a well.

Production growth will come from the entire spectrum of oil development in Oman. PDO wants to increase recovery rates at Yibal, a mainstay of Omani production, to 55 percent through traditional water-flooding. Finally, the discovery of al-Ghubar South in 2009 is the most promising discovery for Oman in years. Some officials at the Ministry of Oil and Gas reckon that al-Ghubar South could add as much as 1 billion barrels to reserves. Two significant discoveries were also made at Malaan West and Taliah in the Lekhwair cluster in northwest Oman, which will broaden baseline production in the future.

Other large EOR projects include:

- Karim Cluster – a cluster of 18 oil small oil fields all flowing to the Nimr production facility, which is operated by Medco (Indonesia). Currently producing 18,000 bbl/d, PDO is aiming to boost production to around 35,000 bbl/d in the short-term.
- Harweel Cluster – PDO estimates a capacity of 100,000 bbl/d from the current 44,000 bbl/d in the next five years.
- Growth of up to 70,000-80,000 bbl/d from five clusters, such as the Rima Cluster, is expected through various efficiency gains and EOR applications.

Consumption and Exports

In 2009, Oman consumed approximately 115,000 bbl/d of petroleum products. Consumption has increased over the last decade, more than doubling from a level of 52,000 bbl/d in 2000. This has largely been attributable to Oman's industrialization and expanding petrochemical sector, along with better roadways and an expanding vehicle fleet.

Though Oman is a significant net exporter of petroleum, they are not a member of OPEC. As is the case with other exports from the Gulf, Asia provides the main consumer markets for Omani crude, led by China and Japan.

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. Located near the capital, Muscat, both the export terminal at Mina al-Fahal and the Main Oil Line feeding the facilities are run by PDO. Pipelines also feed industrial complexes and petrochemical plants, which form an integral part of economic diversification and Oman's expansion into downstream activities. PDO operates about 1,000 miles of oil pipelines which run throughout the country.

Downstream Activities

In 2010, Oman had a refining capacity of 222,000 bbl/d, split between Oman's two refineries. The Mina al-Fahal refinery was Oman's first, opened in 1982, and has a capacity of 106,000 bbl/d of crude distillation after an expansion in 2007. The Sohar refinery was brought on-stream in 2006, with a refinery capacity of 116,000 bbl/d. The refineries are operated by the Oman Refineries and Petrochemicals Company (ORPC), the result of a 2007 merger between the Oman Refinery Company and the Sohar Refinery Company. ORPC is owned by the Omani Ministry of Finance (75 percent) and Oman Oil Company (OOC) (25 percent). The Sohar refinery is currently tendering contracts for an expansion project, which will bring crude distillation capacity to 190,000 bbl/d by 2013.

Oman continues to pursue the building of a large refinery and petrochemical complex at al-Duqm in southern Oman, which would be geared toward export markets. Under a memorandum of understanding (MoU) signed in July 2009, a joint venture between 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.

Oman requires increased natural gas supplies to meet the growth in its domestic consumption as well as its enhanced oil recovery projects and LNG export obligations.

Natural Gas

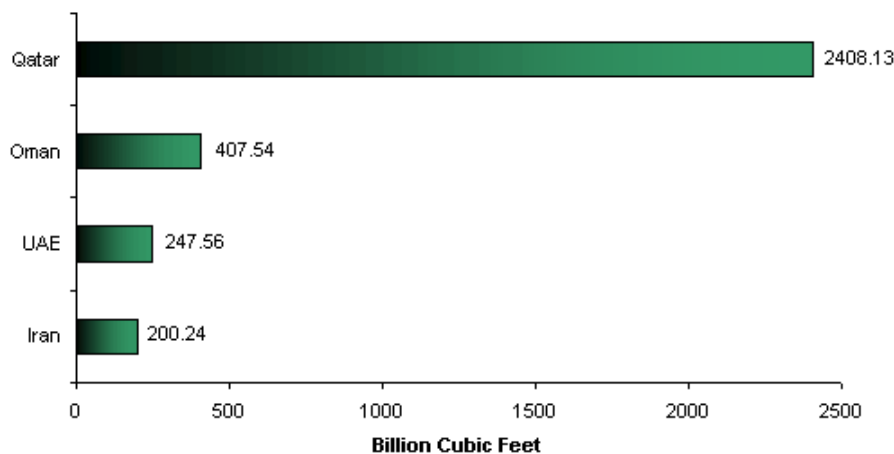
Oman has proven reserves of natural gas amounting to 30 trillion cubic feet (Tcf) as of January 1, 2011, according to *Oil & Gas Journal*. Due to increased domestic consumption, gas reinjection use, and export obligations, Oman requires increasing volumes of natural gas. The Ministry of Oil has announced plans to reassess natural gas reserves, seeking to increase reserves by a trillion cubic feet per year for the next 20 years, through programs akin to the EOR techniques being implemented in the oil sector.

Given domestic consumption and the long-term liquefied natural gas (LNG) export contracts, the country has too little feedstock for electricity generation at seasonal peak times. This shortfall has resulted in service interruptions that have slowed industrialization and economic diversification programs, as well as economic growth generally. A regional power grid is being constructed between all Gulf Cooperation Council (GCC) members, of which Oman is one. This will create the possibility to import electricity, especially from neighboring UAE and its planned nuclear plants, and lessen the strain on domestic natural gas supplies used as feedstock. This prospect will only emerge in the medium-term however, largely after 2017 when UAE's nuclear plants begin to come on-line.

Sector Organization

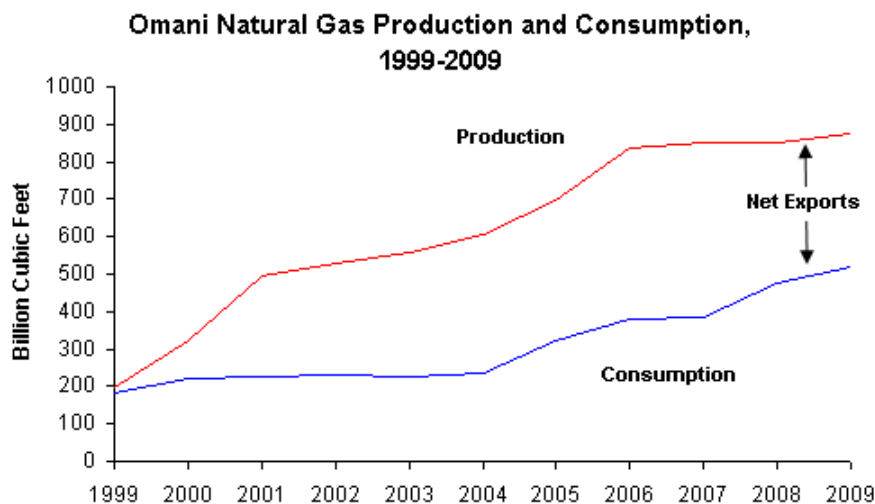
Petroleum Development Oman (PDO) has an even greater presence in the natural gas sector than in the oil sector. The government enlists foreign companies in new exploration and production projects, requiring the sophisticated technology and expertise of the private sector. Developing gas projects with foreign firms such as Occidental, BP, and Petronas will determine Oman's future production. The Oman Gas Company (OGC) directs the country's natural gas transmission and distribution systems. The OGC is a joint venture between the Omani Ministry of Oil and Gas (80 percent) and OOC (20 percent). The Oman Liquefied Natural Gas Company (OLNGC), owned by a consortium including the government and Shell, operates all LNG activities in the sultanate.

Top Middle East Natural Gas Exporters, 2009



Production

Oman produced a total of 875 billion cubic feet (Bcf), about 2.4 billion cubic feet per day (Bcf/d) in 2010. Much of the remaining natural gas reserves are locked in geological formations that are smaller and more difficult to access. For example, the concession of the Khazzan and Makarem natural gas fields operated by BP highlight the technical difficulties facing development of natural gas in Oman. BP has recently increased its estimation for these fields to between 50 and 100 Tcf of reserves in-place, of which only 10 Tcf are recoverable.



Source: EIA

Consumption

Natural gas consumption rose rapidly over the past decade, seeing a 135 percent increase from 1999 to a total of 520 Bcf in 2009. This increase is largely attributable to economic expansion and population growth, while re-injection of natural gas to increase oil production takes up a rising proportion of domestic production. A lack of natural gas resources has impeded progress in economic diversification, especially in the industrial sector. Although Oman is a net exporter of oil and natural gas, it also imports small volumes of natural gas. The Dolphin pipeline provides Oman's only natural gas imports, providing approximately 200 million cubic feet per day (Mcf/d).

Pipelines

Oman's natural gas pipeline system is operated by the Oman Gas Company (OGC), a joint venture between the Sultanate of Oman, with an 80 percent equity holding, and Oman Oil Company (OOC) which owns the remaining 20 percent. The pipeline system consists of 1,250 miles of pipeline, transporting natural gas supplies from production facilities primarily to gas-powered electric plants, participants in the petrochemical and industrial sectors, as well as to the Oman and Qalhat LNG projects.

Exports

The Oman and Qalhat LNG projects are the main source of natural gas exports from Oman, totaling 1.285 Bcf/d. The gas for these projects is sourced from the Saih Rawl and Saih Nihayda gas fields. The LNG exported from these projects is destined for Asian markets, principally China, South Korea and Japan.

Imports

Dolphin Pipeline

Given the shortfalls in natural gas production, in 2007 Oman had to begin importing natural gas. The Dolphin Pipeline system, which transports 2 billion cubic feet per day (Bcf/d) of natural gas from Qatar to neighboring UAE and eventually to Oman by way of the Fujairah - al-Ain pipeline, provides increasing natural gas supplies, around 200 Mcf/d, for use as feedstock in electricity generation.

Before sanctions were implemented on Iran, Oman was also in talks with Iran over a pipeline which would bring 1Bcf/d of natural gas from Iran's Kish gas field, with the possibility of increasing capacity to 3Bcf/d. This natural gas pipeline would terminate at the Qalhat LNG plant for liquefaction and export. This would free domestic production to be connected to the domestic grid.

Profile

Energy Overview

Minister of Oil and Gas	Muhammad bin Hamad bin Sayf al-Rumhi
Proven Oil Reserves (January 1, 2011E)	5.5 billion barrels
Oil Production (2010E)	863,000 barrels per day, of which 860,000 bbl/d was crude oil.

Oil Consumption (2009E)	115,000 barrels per day
Crude Oil Distillation Capacity (January 1, 2011E)	85,000 barrels per day (Oil and Gas Journal); 222,000 barrels per day (Oman Refineries and Petrochemicals Company website)
Proven Natural Gas Reserves (January 1, 2011E)	30 trillion cubic feet
Natural Gas Production 2009	875 billion cubic feet
Natural Gas Consumption 2009	520 billion cubic feet
Recoverable Coal Reserves (2009)	None
Coal Production (2009)	None
Coal Consumption (2009)	None
Electricity Installed Capacity (2008)	3.99 gigawatts
Electricity Production (2008)	17.63 billion kilowatt hours
Electricity Consumption (2008)	13.25 billion kilowatt hours
Total Energy Consumption (2008)	0.71 quadrillion Btus*, of which Natural Gas (70.1%), Oil (29.9%)
Total Per Capita Energy Consumption (2008)	249.78 million Btus

Oil and Gas Industry

Organization	Petroleum Development Oman (PDO) controls most 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	BP, Royal Dutch Shell, CNPC, Occidental Petroleum, Partex, PTTEP, Tethys, 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 (106,000 bbl/d); Sohar (116,000 bbl/d)

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power.

**GDP figures from Global Insight estimates based on purchasing power parity (PPP) exchange rates.

Links

EIA Links

[EIA – Oman Country Energy Profile](#)

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 Ministry in the U.S.](#)

[Ministry of Oil and Gas](#)

[Ministry of National Economy](#)

[Ministry of Information](#)

[Dolphin Energy](#)

[Occidental Petroleum in Oman](#)

[Oman LNG](#)

[Oman Oil Company](#)

[Oman Gas Company](#)

[Oman Refineries & Petrochemicals Company LLC](#)

[Petroleum Development Oman](#)
[Qalhat LNG](#)
[Shell Oman Marketing Company](#)

Sources

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