

Oman

International energy data and analysis

Last Updated: December 5, 2014 ([Notes](#))

[full report](#)

Overview

Oman is the largest oil and natural gas producer in the Middle East that is not a member of the Organization of the Petroleum Exporting Countries.

Located on the Arabian Peninsula, Oman's proximity to the Arabian Sea, Gulf of Oman, and Persian Gulf grants it access to some of the most important energy corridors in the world, enhancing Oman's position in the global energy supply chain. Oman plans to capitalize on this strategic location by constructing a world-class oil refining and storage complex near Duqm, Oman, which lies outside the Strait of Hormuz (an important [oil transit chokepoint](#)).

Like many countries in the region, Oman is highly dependent on its hydrocarbons sector. In 2012, Oman's hydrocarbons sector accounted for 86% of government revenues, according to the country's Ministry of Finance.¹ Revenues from oil and natural gas accounted for approximately 50% of Oman's gross domestic product in 2013, according to the Central Bank of Oman.² Oman's fiscal breakeven price for oil in 2014 was approximately \$105 per barrel, according to the Ministry of Oil and Gas,³ meaning that Oman's government needs the export price of oil to remain at or above that level to secure sufficient revenues. In 2013, the price for Omani crude averaged \$105.50, 3.7% lower than the previous year.⁴



Petroleum and other liquid fuels

Oman's total oil production reached 945,000 barrels per day in 2013, up 2% from the previous year.

Sector organization

The Ministry of Oil and Gas coordinates the government's role in the Omani hydrocarbon sectors. Final approval on policy and investment, however, rests with the Sultan of Oman. Petroleum Development Oman (PDO) holds most of Oman's oil reserves and is responsible for more than 70% of its crude oil production, according to the PDO website. In addition to the government's 60% ownership stake in PDO, Shell (34%), Total (4%), and Portugal's Partex (2%) also own stakes in PDO.⁵ The Oman Oil Company (OOC) is responsible for energy investments both inside and outside Oman, and is fully government owned. The Oman Oil Refineries and Petroleum Industries Company (ORPIC) controls the country's refining sector and owns both of Oman's operating refineries.

Reserves

According to the *Oil & Gas Journal*, Oman had 5.5 billion barrels of estimated proved oil reserves as of January 2014.⁶ Oman's 5.5 billion barrels of proved oil reserves rank 7th in the Middle East, and 23rd in the world. A report published by the U.S. Geological Survey in 2012 stated that the estimated mean undiscovered energy resources in the South Oman Salt Basin—located in the southern part of the country—totaled more than 370 million barrels of oil, 315 billion cubic feet (Bcf) of natural gas, and more than 40 million barrels of natural gas liquids (NGL).⁷ With rising production levels, a growing petrochemical sector—which relies on liquefied petroleum gases (LPG) and NGL—and additional potential resources, the country is unlikely to significantly alter its dependence on hydrocarbons in the short term.

Consumption

In 2011, oil accounted for 71% of Oman's total primary energy consumption, and natural gas made up the remaining 29%. With the exception of 2009, Oman's petroleum consumption rose steadily over the past decade, reaching 154,000 bbl/d in 2013. Most of Oman's consumption is distillate and residual fuel oil as well as motor gasoline.⁸ With transportation fuel consumption nearly doubling between 2005 and 2013, the country's refinery capacity is no longer able to meet the demand for domestic transportation fuels internally.

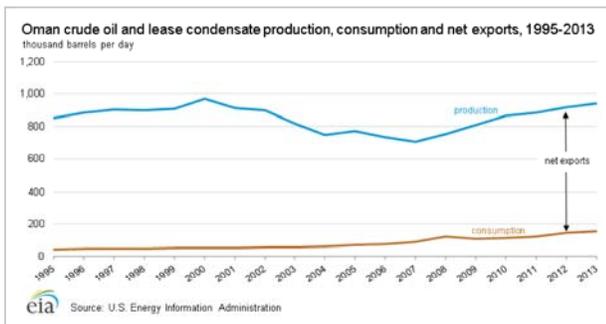
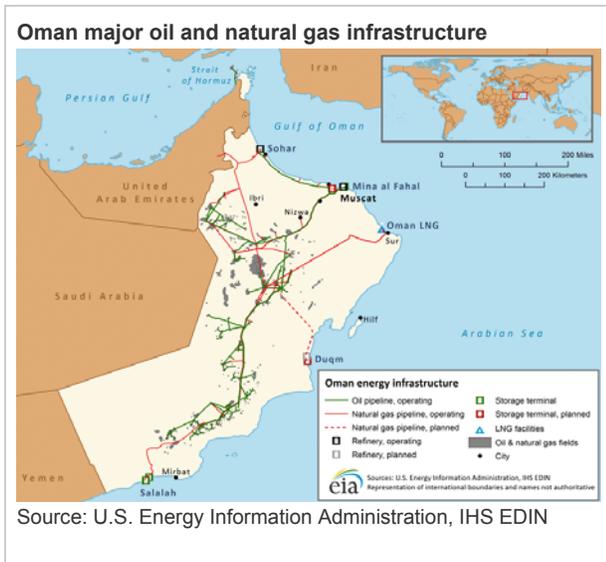
Exploration and production

Enhanced oil recovery techniques helped Oman's oil production rebound from a multi-year decline in the early 2000s.

Occidental Petroleum has the largest presence of any foreign firm and is Oman's largest independent oil producer. Other major players with interests in Oman include Shell, Total, Partex, BP, CNPC, KoGas, and Repsol.⁹ By the end of 2013, there were exploration and production activities in all 31 of Oman's exploration blocks, according to the Ministry of Oil and Gas.¹⁰ The Oman Bid Round 2014 will offer up five exploration blocks (three onshore and two offshore) to tender in the future.¹¹ Nearly all of Oman's oil production comes from the Oman Basin, which spans most of the country.

Oman's crude oil and lease condensate production ranks 7th in the Middle East and 20th in the world. Oman is the largest oil producer in the Middle East that is not a member of the Organization of Petroleum Exporting Countries (OPEC). Oman's average annual crude oil production and lease condensate peaked in 2000 at 970,000 barrels per day (bbl/d), but dropped to 710,000 bbl/d in 2007. Oman successfully reversed that decline, and annual crude oil and lease condensate production rose each of the next five years, averaging 945,000 bbl/d in 2013. Improved Enhanced Oil Recovery (EOR) techniques helped drive this production turnaround, although the country also experienced some additional production gains as a result of recent discoveries. Oman's government aims to keep production near its current level for at least the next five years by continuing to apply EOR techniques and the cost management associated with it.¹²

Several recent developments could contribute to future oil production growth in Oman. Some of the notable new developments include Circle Oil's announcement of Block 52 (offshore) with its 7 billion barrels of oil in place¹³ and Occidental Petroleum's Block 53, located at the Mukhaizna field, which could produce roughly 44 million of barrels of oil each year.¹⁴ Occidental Petroleum implemented one of the world's largest to date steam flood projects in Oman in 2005.



Enhanced oil recovery (EOR)

The continued viability of developing Oman's oil and natural gas resources relies heavily on extraction technologies. Several enhanced oil recovery techniques are already used in Oman, including polymer, miscible, and steam injection techniques.¹⁵ Because of the relatively high cost of production in the country, Oman's government offers incentives to international oil companies for exploration and development activities in the country's difficult-

to-recover hydrocarbons. The government enlists foreign companies in new exploration and production projects, offering generous terms for developing fields that require the sophisticated technology and expertise of the private sector. Given the technical difficulties involved in oil production, the contract terms for international oil companies (IOCs) have become more favorable in Oman than in other countries in the region, some allowing significant equity stakes in certain projects.¹⁶

To increase oil production, enhanced oil recovery techniques, such as steam injection and miscible injection, have been the key driver of Oman's oil production. Block 6, operated by PDO, is the center of current EOR operations, with the Marmul field (polymer), Harweel field (miscible), Qarn Alam field (steam), and Amal–West (solar), using all four of the EOR techniques within the same block.¹⁷ Solar EOR at Alam–West in southern Oman is the first solar EOR project in the Middle East, completed by GlassPoint Solar in 2012 and commissioned in early 2013. Backed by a US \$53 million equity investment, including funding from Oman's State General Reserve Fund (SGRF), GlassPoint Solar's project involves the production of emissions–free steam that feeds directly into the thermal EOR operations currently in existence. This process reduces the need for using natural gas in EOR projects.¹⁸ This project serves as an operational starting point for larger steam–powered EOR projects in the future.

Processing and refining

Oman is not a major refined petroleum product exporter, although there are plans to expand the country's refining capabilities in the next few years. Oman aims to capitalize on its strategic location on the Arabian Peninsula by expanding its refining and storage sectors. Plans to develop a major bunkering and storage terminal are moving forward, and the facility's location outside the Strait of Hormuz could make it an attractive option for international crude oil shippers.

Oman has two operating refineries, Mina al Fahal and Sohar, with a combined nameplate capacity of 222,000 bbl/d. Steps are underway to upgrade the facility at Sohar as part of the ORPIC-led Sohar Refinery Improvement Project (SRIP). Sohar's capacity is expected to expand to 198,000 bbl/d from 116,400 bbl/d in the coming years.¹⁹ Oman aims to construct a refinery near Duqm with a capacity of 230,000 bbl/d²⁰ as well as a 200-million-barrel crude oil storage terminal in the same area. The storage terminal would be one of the world's largest refineries, and its location outside the Strait of Hormuz would make it strategically important.

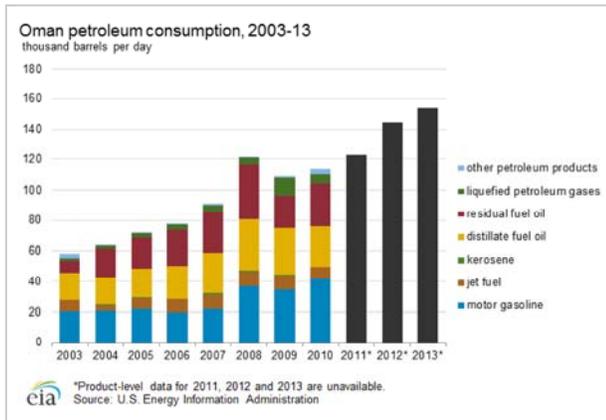
Oman does not have any international oil pipelines, although there are plans to expand the country's domestic pipeline infrastructure. Plans include building a pipeline that connects the planned storage terminal at Duqm with the existing export infrastructure in the center of the country.²¹ Another proposal is the Muscat Sohar Pipeline Project (MSPP).²² MSPP, if built, would connect Oman's two operating refineries by a 280 km pipeline to reduce tanker traffic between the two coastal facilities.²³ The project's later phases include plans to construct new storage facilities, with the goal of enabling Oman to hold up to 30 days of oil reserves.²⁴

Imports and exports

*Oman is an important oil exporter, particularly to Asian markets. In 2013, more than 97% of the country's oil exports went to countries in Asia, of which nearly 60% went to China.*²⁵

Oman's only export crude stream is the Oman blend, which is a medium-light and sour (high sulfur) crude. Oman is an important crude oil exporter, particularly to Asian markets. In 2013, Oman exported an estimated 833,400 bbl/d of crude oil and condensate, of which nearly 60% went to [China](#).

Oman does not currently import any crude oil, but it does import refined petroleum products for use in the domestic market. In 2013, Oman imported almost 130,000 bbl/d of refined petroleum products, most of which was gasoil, naphtha, and gasoline.



2013 Oman crude oil and condensate exports, by country

Country	Amount (thousand bbl/d)
China	495
Japan	80
Taiwan	75
Thailand	47
India	44
Singapore	37
South Korea	14
Sri Lanka	13
Oman Oil Refineries and Petroleum Industries (ORPIC) and Other	28
Total	833

Source: Oman Ministry of Oil and Gas

Natural gas

Oman recently combined the Oman LNG and Qalhat LNG companies to streamline the country's LNG sector. The new company, also called Oman LNG, controls the country's 10.4 million tons (approximately 500 billion cubic feet (Bcf)) per year of export capacity.

Sector organization

PDO has an even greater presence in the natural gas sector than it does in the oil sector, accounting for nearly all of Oman's natural gas supply along with smaller contributions from Occidental Petroleum, Oman's largest independent oil producer, and Thailand's PTTEP. 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%) and OOC (20%). Oman Liquefied Natural Gas (OLNG)—owned by a consortium including the government, Shell, and Total—operates all liquefied natural gas (LNG) activities in Oman through its three liquefaction trains in Qalhat near Sur.²⁶

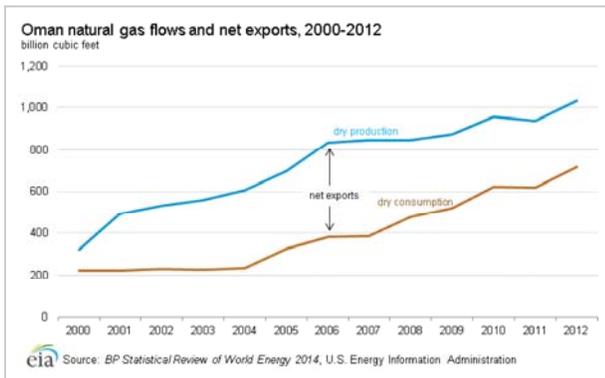
Exploration and production

Oman's potential for natural gas production growth may be substantial, supported by promising developments in several new projects.

Oman held 30 trillion cubic feet (Tcf) of proved natural gas reserves as of January 2014, according to the *Oil & Gas Journal*.²⁷ In 2012, the country was the 5th largest dry natural gas producer in the Middle East and the 26th largest producer worldwide. Oman's natural gas sector grew in importance over the past two decades, largely the result of the opening of the country's two LNG facilities, in 2000 and 2005.²⁸ Prior to 2000, Oman produced small quantities of dry natural gas, averaging just 154 billion cubic feet (Bcf) per year between 1990 and 1999. In 2013, Oman produced 1.1 Tcf of dry natural gas, exporting almost 410 Bcf in the form of LNG and consuming the remainder in the domestic market.²⁹

The opening of the Oman LNG facility in 2000 helped spur Oman's dry natural gas production, which grew by more than 80% between 2004 and 2013. Official figures indicate that Oman's gross natural gas production grew to more than 1.3 Tcf in 2013, which is 3% higher than the previous year.³⁰ The government expects gross natural gas production to reach close to 1.5 Tcf by the end of 2014.³¹ Nearly 82% of the country's production in 2013 came from nonassociated natural gas fields, according to government figures.³²

The greatest growth potential for Oman's natural gas production is in the Khazzan-Makarem field in BP's Block 61. The field is a tight gas formation, and BP suggests the field has between 15 Tcf and 20 Tcf of recoverable natural gas resources, and up to 100 Tcf of natural gas in place.³³ However, ahead of the Block 61 project, Oman is set to bring onstream the Abul Tabul gas field in Block 60, as well as a number of other projects, to help meet short-term demand in the country. In 2013, Abul Tabul increased production to 90 MMcf of natural gas per day and 6,000 bbl/d of condensates.³⁴



Imports and exports

Oman currently exports liquid natural gas (LNG) from two liquefaction facilities, although rising domestic demand for natural gas could limit the volumes available for export in the future.

Imports

Oman has just one international natural gas pipeline—the Dolphin Pipeline—that runs from Qatar to Oman through the United Arab Emirates. Oman is not a major importer of natural gas, although the country does import approximately 51 Bcf per year from Qatar through the Dolphin Pipeline, according to a 2013 report by the Middle East Economic Survey.³⁵ The imports through the Dolphin Pipeline are necessary to meet the rising level of domestic consumption. However, Oman's Ministry of Oil and Gas is looking to phase out imports from the Dolphin Pipeline as soon as more domestic gas can be produced.³⁶ Rising natural gas consumption prompted the Oman LNG company to announce that it would divert all its currently exported volumes of natural gas away from foreign markets and toward domestic consumers by 2024.

Oman reinjected 22% of its gross natural gas production (37 million cubic meters, or 1.3 Tcf) in oil extraction in 2013, according to the Oman Ministry of Oil and Gas.³⁷ With the continuing rise of Oman's natural gas demand (tripling over the past decade), Oman plans to divert all of the natural gas used in its liquefaction export plants to the domestic market by 2024 to help satisfy demand.³⁸

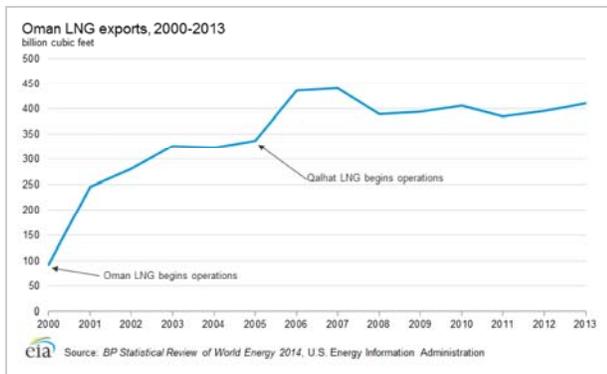
Exports

Oman is a member of the Gas Exporting Countries Forum (GECF) and exports natural gas as LNG through its two liquefaction facilities near Sur, in the Gulf of Oman.³⁹ In 2013, Oman exported approximately 410 Bcf of natural gas, which is roughly 63% of the country's total

capacity.⁴⁰ Nearly all of Oman's natural gas exports go to [Japan](#) and [South Korea](#), although in 2013 a small amount went to Spain.⁴¹

The process to combine Oman LNG and Qalhat LNG companies into a single entity under the Oman LNG banner began in September 2013. Combining these companies gave Oman LNG control of all three of the country's LNG trains, with a combined capacity of 10.4 million tons per year (approximately 500 Bcf).⁴²

In August 2013, Oman signed a memorandum of understanding with Iran on a natural gas import contract. If realized, it will be a \$60 billion, 25-year supply deal beginning in 2015, and will connect the two countries through a pipeline under the Gulf of Oman. However, the gas deal is stalled until further negotiations.



Electricity

Oman's electricity sector relies heavily on the country's domestic natural gas resources to fuel electricity generation in Oman.

The Authority for Electricity Regulation, Oman regulates the country's electricity and associated water sectors. Its primary functions include implementing general policy from the state; licensing; compliance; and coordination between the various ministries, organizations, and stakeholders in the sector. The Oman Power and Water Procurement Company is the planning body for power supplies in Oman, and the Oman Electricity Transmission Company is in charge of the country's transmission networks.

Oman's electricity sector has two major networks, the Main Interconnected System (MIS) and the Salalah system. The larger of the two, the MIS, covers most of the northern area of Oman. The Salalah portion of Oman's grid covers areas in the south. Areas outside both networks get electricity from the Rural Areas Electricity Company (RAECO), primarily through the use of diesel generators.⁴³ According to International Energy Agency (IEA) data, roughly 97% of the country has access to electricity.⁴⁴

Oman's electrification generation more than doubled between 2001 and 2011, from 9.2 billion kilowatthours to approximately 20 billion kilowatthours. Electricity consumption over the same period grew at a similar rate, rising by nearly 10 billion kilowatthours. Oman generates electricity primarily from natural gas, although there is some diesel/distillate generation as well.

Oman is a part of the Gulf Cooperation Council's (GCC) grid interconnection system, which allows for electricity transfers between the six connected countries ([Kuwait](#), [Saudi Arabia](#), [Qatar](#), [Bahrain](#), the United Arab Emirates, and Oman). Oman and the United Arab Emirates established their connection in October 2011.⁴⁵

Oman has a nascent renewable energy sector, with several projects making progress in 2013. In its 2012 Annual Report, Oman's Rural Areas Electricity Company detailed five renewable electricity projects, of which three are solar and two are wind.⁴⁶ In fourth-quarter 2013, RAECO agreed to the Al-Mazyunah power purchase agreement to construct a 303 kW capacity solar plant.⁴⁷ The expected benefits of this project, especially on fuel savings, are great. The combined capacity of the five projects is more than 6 megawatts, but none of the proposed facilities are ready to begin operations.⁴⁸ While Oman does not currently have a nuclear energy program, the country joined the International Atomic Energy Agency in 2009. Currently, there are no plans to construct any nuclear generating facilities.

Notes

- Data presented in the text are the most recent available as of December 5, 2014.
 - Data are EIA estimates unless otherwise noted.
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Endnotes

¹Oman Ministry of Oil and Gas, <http://www.mog.gov.om/english/tabid/54/Default.aspx>

²Central Bank of Oman, "Annual Report 2013," (June, 2014), page 6.

³Oman Ministry of Oil and Gas, <http://www.mog.gov.om/english/tabid/54/Default.aspx>

⁴Oman Ministry of Oil and Gas, "Energy for Oman Today and Tomorrow: Annual Report 2013" (2013).

⁵Petroleum Development Oman.; Energy Intelligence, "International Crude Oil Market Handbook 2011," (September 1, 2011).

⁶*Oil & Gas Journal*, "Worldwide look at reserves and production" (January 1, 2014).

⁷U.S. Geological Survey, "Assessment of Undiscovered Conventional Oil and Gas Resources of the Arabian Peninsula and Zagros Fold Belt, 2012," (September 2012), page 3.

⁸*Oil & Gas Journal*, "Worldwide look at reserves and production" (January 1, 2014).

⁹Petroleum Development Oman, <http://www.pdo.co.om/Pages/Home.aspx>

Note: Occidental Petroleum Oman's operations are located primarily at the Mukhaizna Field in south-central Oman, and blocks 9,27, and 62 in northern Oman. Oxy has been working in Oman for over 30 years and has increased the country's production and reserves greatly. In 2013, the average gross daily oil production at Mukhaizna was 123,000 bbl/d, over 15 times higher than production levels in 2005, when Oxy assumed operation of the field.

¹⁰Oman Ministry of Oil and Gas, "Annual Report 2013: Energy for Oman Today & Tomorrow," (2013), page 9.

¹¹Ministry of Oil and Gas, "Oman Bid Round 2014."

¹²Oman Ministry of Oil and Gas, <http://www.mog.gov.om/english/tabid/54/Default.aspx>

Note: For more details on which blocks produce how much: <http://www.mog.gov.om/Portals/0/pdf/MOG-Book-2013-eng.pdf>

¹³Oil & Gas News, "Sultanate places its bet on a successful exploration plan,"

http://www.oilandgasnews.com/Article/37467/Sultanate_places_its_bet_on_a_successful_exploration_plan

¹⁴Mubadala, "Mukhaizna" (Accessed September 18, 2014), <http://www.mubadala.com/en/what-we-do/oil-and-gas/mukhaizna-block-53>

¹⁵Petroleum Development Oman, <http://www.pdo.co.om/Pages/Home.aspx>

Note: Oman drilled 33 exploratory wells in 2013 with 16 companies operating in the concession blocks in the country. According to Arabian Oil and Gas Journal, EOR techniques account for 180,000 to 200,000 bbl/d of the country's annual oil production of around 940,000 bbl/d. It is argued that EOR techniques come at the expense of roughly \$10-12 per barrel of oil. <http://www.arabianoilandgas.com/article-12918-eor-costly-for-oman-oil-production/>

¹⁶IMF, "GCC Countries: From Oil Dependence to Diversification," (2003).

¹⁷Middle East Economic Survey, "Oman Taps Shell for 30,000 B/D Crude Output Boost" (September 5, 2014), page 7. Middle East Economic Survey, "Oman Targeting Steady Crude Output Through 2018"(March 7, 2014), page 4.

¹⁸GlassPoint Solar, "Petroleum Development Oman and GlassPoint Commission the Middle East's First Solar EOR Project" (May 21, 2013).

Note: GlassPoint Solar is setting out to make solar thermal EOR techniques economical for Oman, and with gas consumption rising from its use in EOR techniques, solar thermal techniques cuts the gas use down to only 23% of the operation. Oman is the pilot project for this type

of EOR and PDO is discussing the next phase and making this installation 100x larger than the current one.

¹⁹Oman Oil Refineries and Petroleum Industries Company, <http://www.orpic.om/>

²⁰Middle East Economic Survey, "DRPIC Tenders Duqm Refinery Site Prep" (August 22, 2014), page 7.

Note: Duqm is being developed by the Oman Oil Company in partnership with Abu Dhabi-based international Petroleum Investment Company, creating a joint venture company called the Duqm Refinery and Petrochemical Industries Company.

²¹International Petroleum Investment Company, <http://www.ipic.ae/english>

²²Oman Oil Refineries and Petroleum Industries Company, <http://www.orpic.om/>

²³Oman Oil Refineries and Petroleum Industries Company, <http://www.orpic.om/>

²⁴Middle East Economic Survey, "Oman Plans Muscat-Sohar Pipeline" (February 22, 2013), page 9.

²⁵Oman Ministry of Oil and Gas, <http://www.mog.gov.om/english/tabid/54/Default.aspx>

²⁶Oman LNG, <http://www.omanlng.com/en/Pages/HOME.aspx>

Note: Oman's LNG liquefaction plant is located on the coast at Qalhat near Sur and its head office is in Muscat. Oman LNG's claims its activities contribute to helping the Omani government diversify the economy.

²⁷*Oil & Gas Journal*, "Worldwide Look at Reserves and Production" (January 1, 2014).

²⁸Oman Ministry of Oil and Gas, <http://www.mog.gov.om/english/tabid/54/Default.aspx>

²⁹BP Statistical Review of World Energy, 2014

³⁰Oman Ministry of Oil and Gas, <http://www.mog.gov.om/english/tabid/54/Default.aspx>

³¹Middle East Economic Survey, "Abul Tabul Commissioning to Kick Start Oman Gas Boost" (August 1, 2014), page 4.

³²Oman Ministry of Oil and Gas, <http://www.mog.gov.om/english/tabid/54/Default.aspx>

³³Middle East Economic Survey, "Oman, BP Sign Final Khazzan Tight Gas Deal" (December 20, 2013), page 7.

³⁴Middle East Economic Survey, "Abul Tabul Commissioning To Kick Start Oman Gas Boost" (August 1, 2014), page 4.

³⁵Middle East Economic Survey, "Omani Gas, Power Sector At the Crossroads" (February 1, 2013), page 13.

Note: The Dolphin gas pipeline was conceived in 1999 to produce, process and transport to Qatar to the UAE and Oman. This pipeline is the largest energy-related venture ever taken in the region, and is the first of its kind for the Gulf Cooperation Council (GCC) countries.

³⁶Oman Ministry of Oil and Gas, <http://www.mog.gov.om/english/tabid/54/Default.aspx>

³⁷National Centre for Statistics and Information, (accessed September 22, 2014), http://www.ncsi.gov.om/NCSI_website/N_Default.aspx

³⁸Middle East Economic Survey, "Analysis: Changes Ahead for Gulf LNG Importers and Producers" (June 14, 2013), page 8.

³⁹Economist Intelligence Unit, <http://www.economist.com/topics/economist-intelligence-unit>

⁴⁰BP Statistical Review of World Energy, 2014

⁴¹BP Statistical Review of World Energy, 2014

⁴²Oman LNG, <http://www.omanlng.com/en/Pages/HOME.aspx>

⁴³Oman Power and Water Procurement Company. <http://www.omanpwp.com/Default.aspx>

⁴⁴International Energy Agency, <http://www.iea.org/>

⁴⁵Cigre, "GCC Interconnection Grid: Operational Studies for the GCC Interconnection with United Arab Emirates (UAE)" (2012), page 1.

⁴⁶Rural Areas Electricity Company, "Delivering Electricity to Rural Oman: Annual Report 2012" (2012).

⁴⁷Rural Areas Electricity Company, "Delivering Electricity to Rural Oman: Annual Report 2013" (2013).

⁴⁸Rural Areas Electricity Company, "Delivering Electricity to Rural Oman: Annual Report 2012" (2012).