

Egypt

International energy data and analysis

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[full report](#)

Overview

Egypt is the largest non-OPEC oil producer in Africa and the second-largest dry natural gas producer on the continent. The country also serves as a major transit route for oil shipped from the Persian Gulf to Europe and to the United States.

Egypt is the largest oil producer in Africa outside of the Organization of the Petroleum Exporting Countries (OPEC) and the second-largest natural gas producer on the continent, behind [Algeria](#). Egypt plays a vital role in international energy markets through the operation of the Suez Canal and the Suez-Mediterranean (SUMED) Pipeline.

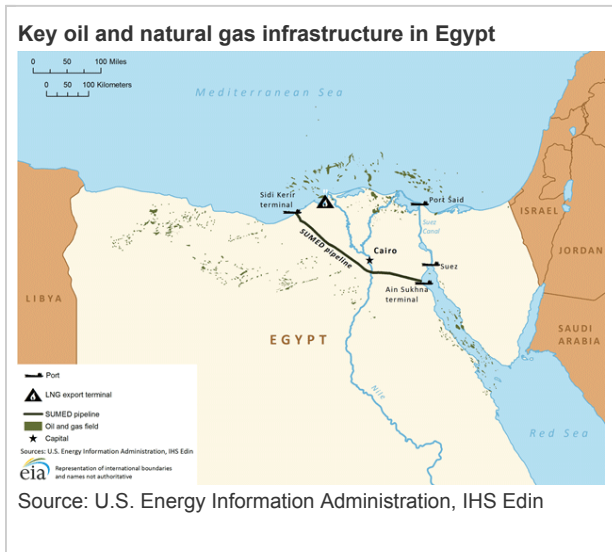
The Suez Canal is an important transit route for oil and liquefied natural gas (LNG) shipments traveling northbound from the Persian Gulf to Europe and to North America and shipments traveling southbound from North Africa and countries along the Mediterranean Sea to Asia. The SUMED Pipeline is the only alternative route nearby the Suez Canal to transport crude oil from the Red Sea to the Mediterranean Sea if ships are unable to navigate through the Suez Canal. Fees collected from the operation of these two transit points are significant sources of revenue for the Egyptian government.

Egypt has the third-largest population in Africa, after [Nigeria](#) and [Ethiopia](#), and the third-highest gross national income (GNI), after Nigeria and [South Africa](#), according to the World Bank.¹ Egypt's economy suffered during and after the 2011 revolution as the country experienced a sharp decline in tourism revenue and foreign direct investment, according to the International Monetary Fund (IMF). Annual gross domestic product (GDP) growth in Egypt dropped from 5.1% in 2010 to 1.8% in 2011 and still remains below the pre-revolution level, averaging 2.1% in 2013.² According to the IMF, financial support from some Persian Gulf countries has helped Egypt meet its domestic energy demand.³

Egypt's economy has not fully recovered since the 2011 revolution. The Egyptian government is in the process of implementing an energy subsidy reform to reduce spending. In the fiscal year (FY) 2013/14 (ending June 30, 2014), Egypt spent 126.3 billion Egyptian pounds (US \$18.2 billion) on oil product subsidies and 13.3 billion Egyptian pounds (US \$1.8 billion) on electricity subsidies. In FY 2014/15, the Egyptian government projects that the cost of oil product subsidies will fall to 70 billion Egyptian pounds (US \$9.2 billion) because of the subsidy reform, which led to an increase in oil product prices in 2014, and because of the fall in global crude oil prices since mid-2014. On the contrary, Egypt's spending on electricity subsidies has increased and is budgeted to cost 27.4 billion Egyptian pounds (US \$3.6 billion) in FY 2014/15.⁴

The high cost of energy subsidies in Egypt has contributed to the country's high budget deficit and the inability of the Egyptian General Petroleum Corporation (EGPC), the country's

national oil company, to pay off its debt to foreign operators. EGPC owes foreign oil and natural gas operators billions of dollars, which has led foreign operators to delay their investments in existing and new oil and natural gas projects.

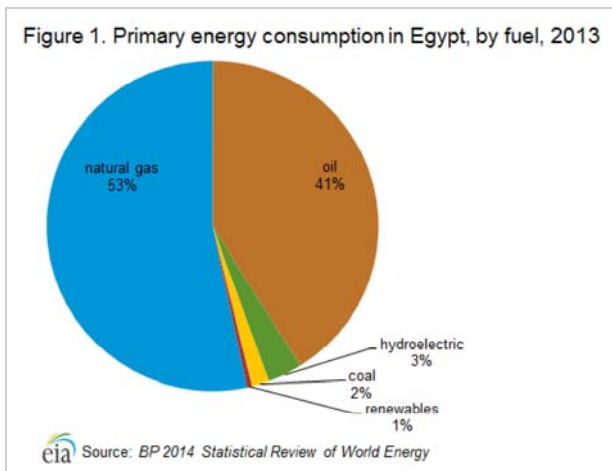


Total primary energy consumption

Egypt is the largest oil and natural gas consumer in Africa, accounting for about 20% of petroleum and other liquids consumption and 40% of dry natural gas consumption in Africa in 2013. Energy subsidies have contributed to rising energy demand and a high budget deficit.

Egypt's total primary energy consumption was 1.7 million barrels per day (b/d) of oil equivalent in 2013, according to the *BP 2014 Statistical Review of World Energy*.⁵ Natural gas and oil are the primary fuels used to meet Egypt's energy needs, accounting for 94% of the country's total energy consumption in 2013 (Figure 1). Oil is mostly used in the transportation sector, while natural gas is used in the power sector and transportation sector in the form of compressed natural gas (CNG) in vehicles.

Egypt is the largest oil and natural gas consumer in Africa, accounting for about 20% of petroleum and other liquids consumption and 40% of dry natural gas consumption in Africa in 2013. The rapid growth of oil and natural gas consumption over the past few decades has been driven by increased industrial output, economic growth, energy-intensive natural gas and oil extraction projects, population growth, an increase in private and commercial vehicle sales, and energy subsidies.



Petroleum and other liquids

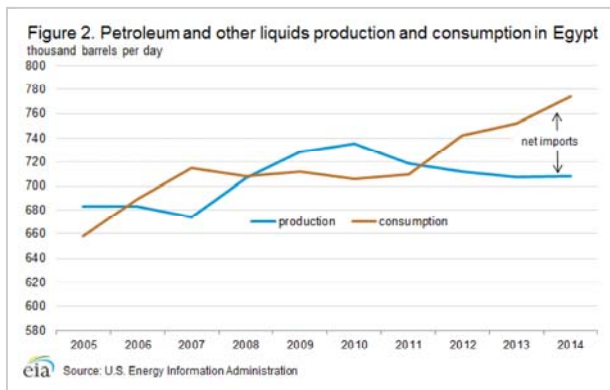
One of Egypt's challenges is to satisfy increasing oil demand amid falling production. Total oil consumption grew by an annual average of 3% over the past 10 years. Egypt's oil consumption currently outpaces its oil production.

According to the *Oil & Gas Journal* (OGJ), Egypt held 4.4 billion barrels of proved oil reserves as of January 1, 2015.⁶ EGPC places Egypt's official oil reserve estimate slightly lower at 4 billion barrels, of which 2.8 billion barrels is crude oil and 1.2 billion barrels is condensate.⁷ New oil discoveries have boosted Egypt's reserve estimate over the past few years. Egypt has maintained a sustained level of exploration activity, and there have been several oil and natural gas discoveries made each year.⁸ In 2013, 86 discoveries of mostly oil were made, according to EGPC.⁹

In 2014, Egypt's petroleum and other liquids production averaged 708,000 b/d, unchanged from the previous year (Figure 2). About half of Egypt's oil production comes from the Western Desert and the remainder comes from the Gulf of Suez, Eastern Desert, Sinai, Mediterranean Sea, Nile Delta, and Upper Egypt.¹⁰ Most of Egypt's production is derived from relatively small fields that are connected to larger regional production systems.

Egypt's oil production declined for more than a decade after reaching a peak of more than 900,000 b/d in the mid-1990s. In 2008, increased output from the Western Desert and offshore areas helped to increase production over the next few years, but production started to decline again shortly after that time. The use of enhanced oil recovery (EOR) techniques at mature fields has eased production declines. Natural gas plant liquids production has increased over the past decade as a result of expanding natural gas production, partially offsetting declines in crude oil production.

One of Egypt's main challenges is to satisfy increasing domestic oil demand amid falling production. Total oil consumption grew by an annual average of 3% over the past 10 years, averaging 775,000 b/d in 2014. Egypt's oil consumption currently outpaces its oil production.



Oil sector management

The Egyptian General Petroleum Corporation (EGPC), the national oil company, is responsible for managing upstream and downstream activities. EGPC's subsidiary, General Petroleum Company, holds several exploration licenses in the Sinai, the Gulf of Suez, and the Western Desert, according to the *Arab Oil and Gas Directory*.¹¹ EGPC owns and operates much of the country's refining capacity as well. International oil companies (IOCs) also play a large role in Egypt's upstream oil sector, holding shares in producing assets in partnership with EGPC. BP, Eni, BG, and Apache are the major oil and natural gas players in Egypt, with the first three primarily invested offshore and Apache in the onshore Western Desert.

Refined oil products

Egypt has the largest oil refining capacity in Africa, although it operates well below capacity. The country's refining output declined by 28% from 2009 to 2013, despite growing domestic oil consumption. As a result, Egypt must import petroleum products to make up for the shortfall.

Estimates of Egypt's oil refining capacity differ among publications. The *Arab Oil and Gas Directory* estimates that Egypt's refining capacity is 704,000 b/d, while OGJ estimates that it is higher at 726,250 b/d (Table 1).¹² Nevertheless, both estimates still qualify Egypt as the largest oil refining capacity holder in Africa. Egypt's refineries mostly process domestically produced crude oil, and refined products are mostly sold to local markets. The refineries are operated by EGPC subsidiaries.

Egypt's refining capacity is expected to increase in late 2015 or in 2016 when a new 85,000 b/d refinery begins operations.¹³ Construction of the refinery is underway, and it is being developed by the Egyptian Refining Corporation (ERC), a public-private partnership financed by Qalaa Holdings (formerly Citadel Capitol) and EGPC. A second refinery project that has made much less progress is a proposed 300,000 b/d refinery. EGPC signed a memorandum of understanding with a Chinese consortium in May 2010 to develop this facility.¹⁴

Table 1. Egypt's crude oil refineries

Refinery operator	Location	Nameplate capacity (barrels per day)
Cairo Petroleum Refining Co.	Mostorod (Cairo)	142,000
Alexandria Petroleum Co.	Alexandria (El-Mex)	115,000
El-Nasr Petroleum Co.	El Suez	100,000
Middle East Oil Refinery	Alexandria (Sidi Kerir)	100,000
Ameriya Petroleum Refining Co.	Alexandria	75,000
Suez Petroleum Processing Co.	El Suez	68,000
Assiut Petroleum Refining Co.	Assiut	50,000
Cairo Petroleum Refining Co.	Tanta	54,000
Total		704,000

Source: Arab Oil & Gas Directory, Egyptian General Petroleum Company

According to data from OPEC's Annual Statistical Bulletin, Egypt's refined petroleum output averaged 445,000 b/d in 2013, suggesting that refinery utilization was about 63%.¹⁵ Egypt's refining output declined by 28% from 2009 to 2013. Facts Global Energy attributes this decline to Egypt's policy that permits foreign oil producers to export more crude oil as repayment of EGPC's financial debt. As a result, Egypt's crude oil exports have not declined over the past few years, despite declining production. In turn, there is a lower volume of domestic crude oil available for the domestic refineries, and Egypt must make up for the difference by importing petroleum products and/or crude oil.¹⁶ Egypt imported about 145,000 b/d of petroleum products in 2014, according to Global Trade Information Services. Egypt also exported about 60,000 b/d of petroleum products that same year.¹⁷

Natural gas

Egypt's dry natural gas production declined by 5% from 2012 to 2013. Substantial natural gas discoveries in the deepwater Mediterranean Sea and in other areas have been undeveloped because the price that Egypt's government was willing to pay foreign operators for the natural gas was too low, making some investment projects commercially unviable. However, in recent years Egypt has signed deals to pay foreign operators a higher price for the natural gas they produce.

According to OGJ estimates as of January 1, 2015, Egypt holds 77 trillion cubic feet (Tcf) of proved natural gas reserves, an increase from the 2010 estimate of almost 59 Tcf and the fourth-largest amount in Africa, after Nigeria, [Algeria](#), and [Mozambique](#).¹⁸ New discoveries have been made almost every year, particularly in the deepwater Mediterranean Sea, the Nile Delta, and the Western Desert.

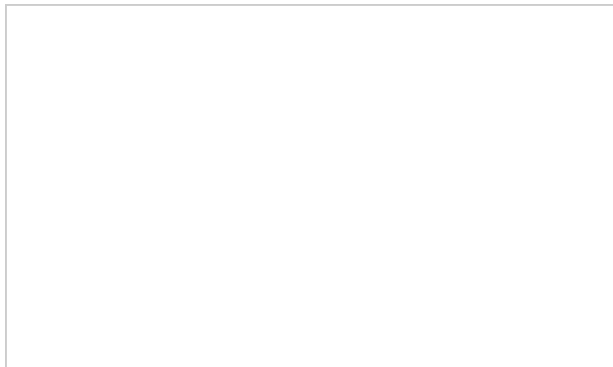
Despite new discoveries, Egypt's dry natural gas production declined by 5% from 2012 to 2013 (Figure 3). Egypt produced 2.0 Tcf of dry natural gas in 2013, of which almost 1.9 Tcf was domestically consumed and more than 0.1 Tcf was exported. Egypt has been diverting natural gas supply away from exports to the domestic market to meet demand. As a result, Egypt's total natural gas exports have declined substantially by an annual average of almost 30% from 2010 to 2013 as rising domestic demand, particularly in the electricity sector, competes with exports.

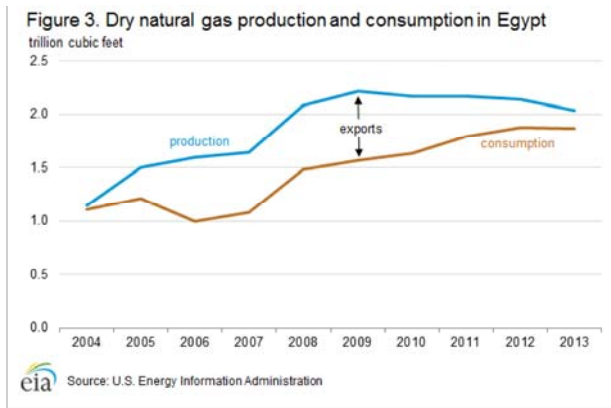
Egypt began importing LNG in 2015 to satisfy its natural gas consumption, which increased by an annual average of 7% over the past decade (2004 to 2013). In May 2014, Egyptian Natural Gas Holding Company (EGAS), the country's national gas company, signed a letter of intent with Hoegh LNG of Norway to use one of its Floating Storage and Regasification Units (FSRUs) for five years to allow Egypt to import LNG. In April 2015, the FSRU arrived off the Red Sea coast at the Ain Sukhna port, along with its first LNG cargo. Egypt has signed deals to import LNG cargos from Russia's Gazprom and Algeria's Sonatrach, along with trading companies Trafigura, Vitol, and Noble.¹⁹

Much of the natural gas consumed in Egypt is used to fuel electric power plants. The Egyptian government encourages households, businesses, and the industrial sector to consider natural gas as a substitute for petroleum products and coal. In January 2008, the World Bank approved loans for the Natural Gas Connections Project, which aims to switch consumption of liquefied petroleum gas (LPG) to natural gas through investment in new connections and to further expand natural gas use in densely populated, low-income areas.²⁰ The share of natural gas consumed in the transportation sector also increased after the development of compressed natural gas (CNG) infrastructure and vehicles.

The price that Egypt has typically paid foreign operators for natural gas that they produce in Egypt was \$2.65 per million British thermal units (Btu). The price has presented a major obstacle for foreign operators wanting to develop natural gas projects in Egypt because it made some of the projects economically unviable. As a result, substantial gas discoveries in the deepwater Mediterranean Sea and in other areas in Egypt have remained undeveloped.²¹ However, in recent years, EGAS has signed deals to pay foreign operators a higher price for the natural gas, ranging from \$3.95 to \$5.88 per million Btu, to attract more foreign investors.²² The price is negotiated on a case-by-case basis and takes into account the cost to explore and develop a project.

Another impediment to increasing natural gas output is the substantial debt that Egypt owes foreign operators. Some of those operators have reduced their drilling activity and delayed project investments that could help reverse Egypt's declining production.²³





Sector organization

EGAS oversees the development, production, and marketing of natural gas. EGAS is also responsible for organizing international exploration bid rounds and awarding natural gas exploration licenses. EGAS and/or EGPC participate with international companies to develop and operate natural gas fields. The Egyptian Natural Gas Company (GASCO) operates many of the gas processing plants.

Foreign companies operating in Egypt's natural gas sector must direct all or a portion of their current production to the domestic market, and the government has demanded that new discoveries be earmarked for the domestic market. Major foreign players in Egypt's upstream natural gas sector include Eni, BG Group, BP, Shell, and Apache.

Natural gas exports

Egypt's natural gas exports declined after 2009 because of increasing domestic consumption and declining production. Egypt's government has been diverting natural gas supplies away from exports to the domestic market. The country began to import LNG in 2015.

Dry natural gas exports, which began in 2003, increased rapidly with the completion of the first stage of the Arab Gas Pipeline (AGP) linking Egypt to Jordan, along with the startup of LNG production in 2004. However, in recent years Egypt's natural gas exports have declined substantially, falling by an annual average of almost 30% from 2010 to 2013. In 2011 and 2012, sabotage attacks repeatedly disrupted gas exports through the AGP, substantially curtailing the amount of natural gas sent to [Jordan](#) and [Israel](#). In 2012, Egypt halted natural gas exports to Israel by canceling its long-term supply contract to Israel because of a payment dispute.²⁴ The move also underlined Egypt's need to divert natural gas supply away from exports to its local market to meet demand.

Pipeline exports

The Arab Gas Pipeline (AGP) originates in Egypt and connects to Jordan, [Syria](#), and [Lebanon](#). In 2008, a leg extension of the AGP was built that runs under water from the starting point in al-Arish in Egypt to Ashkelon in Israel. The AGP had been sabotaged more than a dozen times between 2011 and 2012, which resulted in natural gas supply disruptions to Jordan and Israel. Total exports via the AGP dropped to 32 billion cubic feet (Bcf) in 2012, of which the majority was sent to Jordan, with a smaller amount delivered to Israel before exports were terminated. In 2013, pipeline exports increased slightly to 42 Bcf, according to Cedigaz. This level is a substantial decrease from the natural gas volumes transported via AGP before the revolution, which totaled 193 Bcf in 2010 (Table 2).²⁵

Liquefied natural gas (LNG)

Egypt has two LNG plants with a combined capacity of 610 Bcf per year (or 12.7 million tons per year).²⁶ The Spanish-Egyptian Gas Company (Segas) LNG plant in Damietta started production in late-2004. The plant is owned by Union Fenosa Gas (80%), a joint venture

between Spain's Gas Natural and Italy's Eni, along with Egypt's national companies EGPC and EGAS (10% each). The LNG plant has one train with a capacity of 264 Bcf (5.5 million tons) per year.²⁷ The Segas/Damietta LNG plant has not exported LNG since 2012 because of a lack of natural gas supplies. The Egyptian government redirected natural gas supplies to the domestic market to mitigate fuel shortages and power outages, particularly during the summer months.²⁸ Gas Natural and Eni filed an international arbitration case against EGAS for not abiding by their feed gas contract.²⁹

Egypt's second LNG plant, and the only one currently operating, is located at Idku and is operated by Egyptian LNG, a joint venture among BG, Petronas, GDF Suez, EGPC, and EGAS. The Idku plant has two trains, each with a capacity of 173 Bcf (3.6 million tons) per year.³⁰

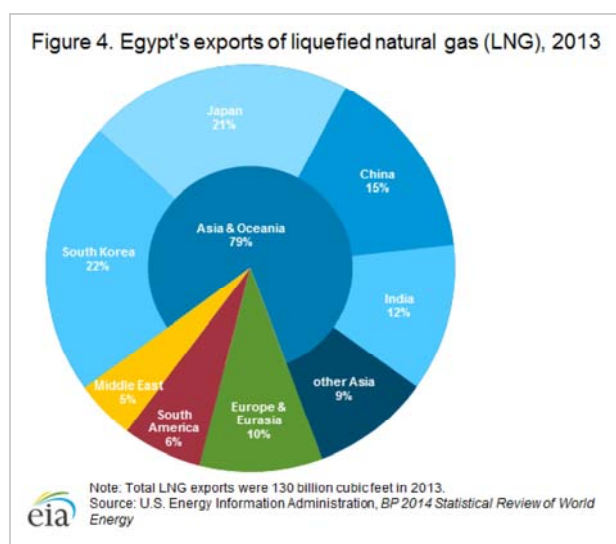
In 2013, Egypt exported 130 Bcf of LNG from the Idku LNG plant (Table 2). Most of Egypt's LNG was exported to Asia (79%), with South Korea being the primary destination, followed by Japan, China, India, and Taiwan, according to the *BP 2014 Statistical Review of World Energy* (Figure 4).³¹ Europe was the second-largest regional destination of Egypt's LNG exports in 2013. Europe previously had been the leading export destination for Egypt's LNG, but Europe's LNG imports from Egypt have fallen in recent years. This drop reflects the overall decrease in Europe's LNG imports since 2012 and increased competition for LNG on the global market.

Table 2. Egypt's natural gas exports

(billion cubic feet)

	2008	2009	2010	2011	2012	2013
Total exports	598	647	535	371	267	172
LNG exports	497	452	343	307	235	130
Pipeline exports	101	194	193	64	32	42

Source: U.S. Energy Information Administration, *BP Statistical Review of World Energy*, and Cedigaz



Suez Canal/SUMED Pipeline

The Suez Canal and SUMED Pipeline are strategic routes for Persian Gulf oil and natural gas shipments to Europe and North America. These two routes combined accounted for about 9% of the world's seaborne oil trade in 2014.

Suez Canal

The Suez Canal is located in Egypt and connects the Red Sea and Gulf of Suez with the Mediterranean Sea. In 2014, oil (crude oil and refined products) and LNG accounted for 17% and 7% of total Suez cargoes, respectively, measured by net metric tonnage. The Suez Canal is unable to handle Ultra Large Crude Carriers (ULCC) and fully laden Very Large Crude Carriers (VLCC) class crude oil tankers. The Suezmax was the largest ship capable of navigating through the canal until 2010 when the Suez Canal Authority extended the canal depth to 66 feet. This extension allowed more than 60% of all tankers to use the Suez Canal, according to the Suez Canal Authority.³²

In 2014, nearly 3.7 million b/d of oil (crude oil and refined products) transited the Suez Canal in directions, 500,000 b/d more than in 2013 and the largest amount ever shipped through the Suez Canal, according to the Suez Canal Authority (Table 3).³³ Increased crude oil exports from Iraq to Europe contributed to higher northbound traffic, while record-level exports of crude oil and petroleum products (particularly distillate fuel oil) from Russia to Asia contributed the most to higher southbound traffic.

The majority of oil transiting the Suez Canal was sent northbound (2.1 million b/d) toward European and North American markets, and the remainder was sent southbound (1.6 million b/d), mainly toward Asian markets. Oil exports from Persian Gulf countries (Saudi Arabia, Iraq, Kuwait, United Arab Emirates, Iran, Oman, Qatar, and Bahrain) accounted for 83% of Suez Canal northbound oil flows. The largest importers of northbound oil flows through the Suez Canal in 2014 were European countries (more than 70%) and the United States (17%). Oil exports from European countries made up more than 55% of Suez southbound oil flows, followed by Russia (20%), and North Africa (Algeria and Libya combined made up 11%). The largest importers of Suez southbound oil flows were Asian countries (75%).³⁴

Total traffic through the Suez Canal fell in 2009, and total oil flows dropped to 1.8 million b/d, their lowest level in recent years. The decrease in oil flows during that time reflected the collapse in world oil market demand that began in the fourth quarter of 2008, followed by OPEC production cuts (primarily from the Persian Gulf), which resulted in a sharp fall in regional oil trade starting in early 2009. Egypt's 2011 revolution did not have any noticeable effect on oil transit flows through the Suez Canal. Over the past few years, oil flows through the Suez Canal have substantially increased, recovering from previous lower levels during the global economic downturn.

SUMED Pipeline

The 200-mile long SUMED Pipeline, or Suez-Mediterranean Pipeline, transports crude oil through Egypt from the Red Sea to the Mediterranean Sea. The crude oil flows through two parallel pipelines that are 42 inches in diameter, with a total pipeline capacity of 2.34 million b/d. Oil flows north starting at the Ain Sukhna terminal along the Red Sea coast to its end point at the Sidi Kerir terminal on the Mediterranean Sea. SUMED is owned by the Arab Petroleum Pipeline Co., a joint venture between the Egyptian General Petroleum Corporation (50%), Saudi Aramco (15%), Abu Dhabi's International Petroleum Investment Company (15%), multiple Kuwaiti companies (15%), and Qatar Petroleum (5%).³⁵

The SUMED Pipeline is the only alternative route to transport crude oil from the Red Sea to the Mediterranean Sea if ships are unable to navigate through the Suez Canal. Closure of the Suez Canal and the SUMED Pipeline would necessitate diverting oil tankers around the

southern tip of Africa (the Cape of Good Hope) adding approximately 2,700 miles to transit from Saudi Arabia to the United States, increasing both costs and shipping time, according to the U.S. Department of Transportation.³⁶ According to the International Energy Agency (IEA), shipping around Africa would add 15 days of transit to Europe and 8-10 days to the United States.³⁷

Fully laden VLCCs going toward the Suez Canal also use the SUMED Pipeline for lightering. Lightering occurs when a vessel needs to reduce its weight and draft by offloading cargo to enter a restrictive waterway, such as a canal. The Suez Canal is not deep enough for a fully-laden VLCC and, therefore, a portion of the crude is offloaded at the SUMED Pipeline at the Ain Sukhna terminal. The now partially-laden VLCC goes through the Suez Canal and picks up the offloaded crude at the other end of the pipeline at the Sidi Kerir terminal.

In 2014, 1.5 million b/d of crude oil was transported through the SUMED Pipeline to the Mediterranean Sea, which was then loaded onto tankers for seaborne trade (Table 3).³⁸ Flows via SUMED increased by 200,000 b/d compared with the 2013 level because of increased crude oil exports from the Persian Gulf to Europe.

Total oil flows via SUMED and the Suez Canal were 5.2 million b/d in 2014, 700,000 b/d higher compared with 2013. Total oil flows via the Suez Canal and SUMED pipeline accounted for about 9% of total seaborne traded oil in 2014.

Table 3. Suez Canal and SUMED pipeline flows of oil and liquefied natural gas (LNG)

million barrels per day	2009	2010	2011	2012	2013	2014
Total oil flows via the Suez Canal and SUMED pipeline	3.0	3.1	3.8	4.5	4.5	5.2
Suez Canal total flows						
crude oil	0.6	0.7	0.7	1.4	1.5	1.7
refined products	1.3	1.3	1.4	1.6	1.7	2.0
total oil	1.8	2.0	2.2	3.0	3.2	3.7
LNG (*Tcf per year)	0.8	1.6	2.1	1.5	1.2	1.2
Suez northbound flows						
crude oil	0.3	0.4	0.5	0.9	1.1	1.4
refined products	0.7	0.7	0.9	0.8	0.7	0.8
total oil	1.0	1.2	1.4	1.7	1.9	2.1
LNG (Tcf per year)	0.8	1.5	1.8	1.2	1.0	0.9
Suez southbound flows						
crude oil	0.3	0.3	0.2	0.5	0.4	0.4
refined products	0.6	0.5	0.6	0.8	1.0	1.2
total oil	0.9	0.8	0.8	1.3	1.3	1.6
LNG (Tcf per year)	0.1	0.1	0.2	0.3	0.2	0.3
SUMED pipeline crude oil flows	1.2	1.1	1.7	1.5	1.3	1.5

Notes: Totals may not exactly match corresponding values as a result of independent rounding. Tcf = Trillion cubic feet.

Source: U.S. Energy Information Administration analysis based on Lloyd's List Intelligence, Suez Canal Authority (with EIA conversions).

Liquefied natural gas (LNG)

LNG flows through the Suez Canal in both directions were 1.2 Tcf in 2014, accounting for 10% of total LNG traded worldwide.

LNG flows through the Suez Canal in both directions were 1.2 Tcf in 2014, accounting for about 10% of total LNG traded worldwide. Southbound LNG transit mostly originates in Algeria and Spain (as re-exports) and is largely destined for Asian markets. Northbound transit is mostly from Qatar mainly destined for European markets. The rapid growth in LNG flows through the Suez Canal after 2008 represents the use of multiple LNG trains in Qatar in 2009-10.

LNG flows through the Suez Canal in both directions have declined from their peak of almost 2.1 Tcf in 2011. The decrease mostly reflects the fall in northbound LNG flows and is consistent with LNG import data for the United States and Europe, which show that total LNG imports into both areas decreased, particularly from Qatar. U.S. LNG imports from Qatar fell from 91 billion cubic feet in 2011 to zero in 2014. The changes reflect growing domestic natural gas production in the United States, a decrease in LNG demand in some European countries, and strong competition for LNG in the global market. As a result, total Suez LNG flows as a share of total LNG traded worldwide fell to 10% in 2014, compared with 18% in 2011.

Electricity

Egypt experiences frequent electricity blackouts because of rising demand, natural gas supply shortages, aging infrastructure, and inadequate generation and transmission capacity. Ongoing political and social unrest in Egypt has slowed the government's plans to expand power generation capacity by 30 gigawatts by 2020.

Egypt's generating capacity, as of May 2015, was 31.45 gigawatts (GW), slightly higher than the expected peak demand in 2015 of 30 GW, according to the Middle East Economic Survey (MEES).³⁹ About 70% of Egypt's electricity is fueled by natural gas, with the remainder being fueled by petroleum and renewable energy (mostly hydroelectricity).⁴⁰ Egypt struggles with natural gas shortages, particularly during the summer months and typically imports fuel oil and diesel fuel to cover the shortfall. Rising power demand, natural gas supply shortages, aging infrastructure, and inadequate generation and transmission capacity have led to frequent blackouts in Egypt.

Ongoing political and social unrest in Egypt has impeded the government's plan to expand power generation capacity by 30 GW by 2020. As a result, Egyptian electricity consumption is increasing much faster than capacity expansions. Private sector organizations and international organizations are providing funds toward brownfield and greenfield projects. The new projects being constructed reflect Egypt's plan to diversify its energy generation mix and include power plants that will be fueled by coal, solar, and wind.

Egypt's renewable energy sector is still relatively undeveloped despite its vast solar and wind resources. The country is targeting a boost in its renewable energy usage and has proposed that renewable energy account for 20% of its power generation capacity by 2020, of which 12% would be wind, 6% hydro, and 2% solar.⁴¹ The government is also pursuing plans to expand power generation from new fossil fuel sources. Egypt recently signed deals for the construction of coal-fired power plants, which if built would be the first in the country. One plant, with a generating capacity of 2,640 megawatts (MW), is planned to be built in South Sinai's Oyoum Moussa area. The second, with a generating capacity possibly up to 3,000 MW, is planned to be built near Hamrawein Port on the Red Sea coast.⁴²

Egypt is also planning to expand its power system interconnection with countries in the Middle East and Africa. Egypt and Saudi Arabia signed a \$1.6 billion deal to connect the two countries with a 3,000 MW electricity cable. This project will indirectly expand each country's electricity capacity by pulling from each other's supplies during peak demand times. According to Business Monitor International (BMI) Research, peak demand times are at different times of the day in each country. Peak demand times are between noon and

midnight in Saudi Arabia and after sunset in Egypt. The connection will provide both Saudi Arabia and Egypt with an extra power source to mitigate peak demand shortfalls. The project's construction is expected to begin in 2015 with completion three years later.⁴³

Egypt's electric transmission grid is already connected to Jordan, Syria, Iraq, Turkey, and Libya, according to BMI. Egypt is also a part of the Nile Basin Initiative and has tentative plans to interlink its transmission grid with nearby African countries within the organization.⁴⁴

Renewable Energy Sources

Hydroelectricity

Hydropower is Egypt's third-largest energy source after natural gas and oil. In 2013, Egypt generated 13.7 billion kilowatt-hours (KWh) of hydroelectricity, accounting for about 9% of Egypt's total power generation.⁴⁵ Most of the country's hydroelectricity comes from the Aswan High Dam and the Aswan Reservoir Dams across the Nile River. However, the vast majority of the Nile River's hydropower potential has already been exploited. As a result, Egypt's New and Renewable Energy Authority (NREA) is actively pursuing other types of renewable projects, primarily solar and wind power, to diversify the country's energy mix.

Ethiopia's plans to build the 6,000 MW Grand Renaissance Dam on the Blue Nile River have prompted concerns about water shortage to Egypt's Aswan High Dam, along with affecting water supply for farming, drinking water, and other industries dependent on the Nile River as a water source in Egypt. In March 2015, Ethiopia, Egypt, and Sudan signed an agreement regarding the Nile River with the understanding that Ethiopia's planned dam will not significantly reduce the water flow to the two countries. Ethiopia's dam is planned to be built by 2017, costing more than \$4 billion, and will be the largest hydropower plant in Africa.⁴⁶

Solar

Egypt's first solar-thermal power plant, located in Kuraymat just south of Cairo, has the capacity to generate 140 MW of solar-thermal energy. The plant has been operational since June 2011, according to the U.S. National Renewable Energy Laboratory (NREL).⁴⁷ The plant uses concentrated solar power (CSP) with back-up natural gas-fired generators. The World Bank and the Japan International Cooperation Agency helped finance the construction of the solar-thermal plant. Egypt is planning to build a 140 MW solar power plant along the Red Sea coast and a 100 MW plant in Kom Ombo.⁴⁸ The country plans to increase solar generation capacity by 3,500 MW by 2027.⁴⁹

Wind

According to NREA, Egypt has abundant wind power resources, especially in the Gulf of Suez and Nile Valley. Egypt generates wind power mainly from the 545 MW Zafarana wind farm and the 5 MW Hurgada wind farm. The Zafarana wind farm, Egypt's largest nonhydro renewable project, is located on the western coast of the Gulf of Suez. The wind farm houses a number of wind projects that were developed in several stages and financed in cooperation with development banks from Germany, Denmark, Spain, and Japan. The government plans to expand wind capacity over the coming years as part of a plan to increase wind generation to 7.2 GW by 2020.⁵⁰

Nuclear

Egypt does not have a commercial nuclear power plant. According to the Nuclear Threat Initiative, Egypt's civil nuclear program is in the research and development phase. The country operates two small [research reactors](#), which are much less powerful than a commercial nuclear power reactor.⁵¹ Egypt has proposed plans in the past to build a nuclear power plant at El Dabaa on the Mediterranean Coast, about 100 miles west of Alexandria, but the project has repeatedly been delayed. In early 2015, Russia and Egypt signed a preliminary deal to work together to build the plant at El Dabaa. Although plans are still

preliminary, the proposed nuclear facility is scheduled to be built by 2020, with four reactors producing 1,200 MW each.⁵²

Notes

- Data presented in the text are the most recent available as of June 2, 2015.
 - Data are EIA estimates unless otherwise noted.
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Endnotes

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