



Country Analysis Brief: Kuwait

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Overview

Table 1. Kuwait's energy overview, 2021

	Crude oil and other			Other			Total
	petroleum liquids	Natural gas	Coal	Nuclear	Hydro	renewables	
Primary energy consumption (quads) 2021	0.6	1.1	<0.1	--	--	<0.1	1.6
Primary energy consumption (percentage)	35.0%	64.8%	<0.2%	--	--	<0.1%	100.0%
Primary energy production (quads) 2021	5.8	0.8	--	--	--	<0.1	6.5
Primary energy production (percentage)	88.0%	12.0%	--	--	--	<0.1%	100.0%
Electricity generation (terawatthours) ^a 2021	27.4	43.8	--	--	--	<0.1	71.2
Electricity generation (percentage)	38.5%	61.5%	--	--	--	<0.1%	100.0%

Data source: U.S. Energy Information Administration, Fitch Solutions

Note: Quads=quadrillion British thermal units

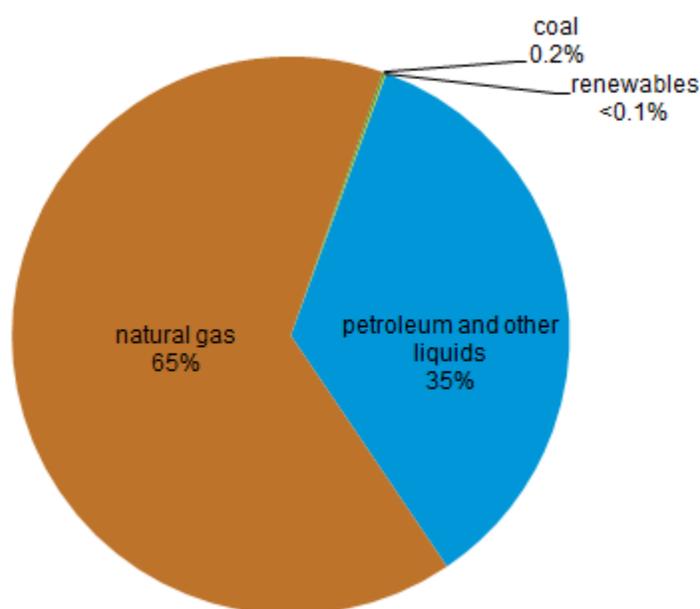
Note: Numbers may not add up because of independent rounding.

^a Crude oil and other petroleum liquids, natural gas, and coal generation proportions from Fitch Solutions, *Kuwait Power Report, Q3 2023*, were used to breakout aggregate fossil fuel generation from EIA's *International Energy Statistics*.

- Kuwait, a long-standing member of OPEC, held 6% of the world's proved oil reserves, including half of the reserves in the Neutral Zone that is shared with Saudi Arabia, in 2022.¹ Kuwait was the third-largest crude oil producer in OPEC and the 10th largest total petroleum liquids producer in the world.²
- Internal political disputes and frequent government turnovers create a high level of uncertainty in energy project investment, which has led to delayed or canceled energy projects over the past decade.³ The ongoing political disputes have prevented reforms necessary for Kuwait to become more energy efficient and to diversify its economy.⁴ The executive branch, which has experienced frequent turnover, has dissolved the legislature several times since Kuwait's parliament was elected in 2020. The most recent suspension occurred in April 2023, less than two months after the legislature was reinstated.⁵ In addition to political stalemates, Kuwait's limits on foreign investment and regulatory hurdles in the oil and natural gas sectors hinder upstream development and limit production increases.⁶
- Crude oil export revenues account for a large part of Kuwait's economy. According to International Monetary Fund estimates, oil and natural gas revenues accounted for an estimated 57% of the government's total revenues in fiscal year 2021 (April 2020–March 2021).⁷ Total petroleum exports accounted for an estimated 78% of the country's total export revenues in 2021.⁸ Much like other OPEC producers, Kuwait saw the value of its net oil exports rise in 2022 after crude oil prices and production rose. In 2022, Kuwait's real value of oil exports totaled \$98 billion, up from \$68 billion (in 2022 dollars) in 2021. However, we expect that oil price decreases and production cuts in 2023 will lower Kuwait's net oil export revenues.⁹
- Kuwait's economy consumed an estimated 1.6 quadrillion British thermal units (quads) of primary energy in 2021, up from 1.5 quads in 2020, after the country began to recover from the

effects of the COVID-19 pandemic (Table 1). We expect energy consumption to continue growing in 2022 as the economy strengthens and as higher oil production requires more energy consumption in the oil industry.¹⁰ Natural gas and oil accounted for virtually all of Kuwait's total primary energy consumption, and coal and renewable energy made up a fraction of consumption (Figure 1). The share of natural gas in Kuwait's energy consumption rose from 32% in 2009 to 65% in 2021 because natural gas displaced some oil in the electric power and industrial sectors.¹¹

Figure 1. Kuwait's primary energy consumption by fuel, 2021



Data source: U.S. Energy Information Administration, International Energy Statistics

Petroleum and Other Liquids

- With proved reserves of crude oil estimated at 102 billion barrels at the end of 2022, Kuwait held the fifth-largest reserves in the Middle East and seventh-largest reserves in the world (Figure 3).¹² Kuwait was the fourth-largest crude oil producer in OPEC, and its crude oil and lease condensate production ranked 10th in the world. Kuwait exported most of its crude oil and condensate production in 2022.¹³
- Kuwait, one of the key members of the [OPEC+ agreement](#), raised its crude oil output in 2022 by nearly 300,000 barrels per day (b/d) to 2.7 million b/d, similar to its 2019 average, after the OPEC+ members reversed the significant production cuts made in 2020. Kuwait produced, on average, more than 3.0 million b/d of total petroleum liquids in 2022, of which 2.7 million b/d was crude oil and about 320,000 b/d was non-crude oil liquids (Figure 4).¹⁴
- Saudi Arabia and Kuwait agreed at the end of 2019 to restart production in the Neutral Zone after a five-year shutdown, and as a result, production began in early 2020 at the Wafra and Al-

Khafji fields. In 2022, PNZ oil production rose to an average of 300,000 b/d, and Kuwait and Saudi Arabia equally shared the production and revenues.¹⁵

- Nine of the OPEC+ participants, including Kuwait, volunteered to cut crude oil production by nearly 1.7 million b/d from May through December 2023. Kuwait pledged to cut its production by 128,000 b/d during this time, which lowered its monthly production target to below 2.6 million b/d.¹⁶ We forecast that Kuwait's overall 2023 oil production will decline slightly compared with the 2022 averages because of this voluntary reduction.¹⁷ In June 2023, OPEC+ agreed to extend crude oil production cuts through 2024, and Kuwait will continue its voluntary production cuts through 2024 which would leave production estimates at below 2.6 million b/d.¹⁸
- The fields in the southeast, mainly from the legacy Burgan field (Figure 2), account for most of Kuwait's oil production and exports, which consist of a medium, sour crude oil grade (higher sulfur content). Kuwait added two grades from the northern region to its portfolio of crude oil export grades starting in 2018. Kuwait began exporting its super light oil grade from the Jurassic oil and natural gas field in mid-2018 and its heavy crude oil grade from the south Ratqa and Umm Naqa fields in early 2020.¹⁹
- Kuwait's crude oil production capacity, including the Neutral Zone, declined after 2017 from nearly 3.2 million b/d to below 2.8 million b/d in 2020 because of insufficient investment, cost increases, regulatory hurdles, and political challenges to project approvals.²⁰ Most of the declines occurred in the large, mature Burgan field in the southeastern region of Kuwait.²¹ To counteract some of the high declines in oil production from its aging fields, Kuwait Oil Company is using enhanced oil recovery (EOR) and constructing gathering centers.²² Despite its technical and financial challenges in the upstream oil sector, Kuwait targets 4 million b/d of crude oil production capacity by 2035.²³
- Kuwait has launched almost 300,000 b/d in additional oil projects since 2018 and has announced several new oil and natural gas projects to bolster its oil production by 2040 (Table 2). Key projects, located in northern Kuwait, include associated light oil from the Jurassic natural gas field projects coming online by 2024 and heavy oil additions at the Lower Fars phase 2 project slated to be online before 2040.
- After reaching a high of more than 520,000 b/d in 2009, Kuwait's oil consumption has gradually declined since then as natural gas has displaced some oil use. Kuwait's oil consumption reached 365,000 b/d in 2022, up from nearly 290,000 in 2020 (Figure 4).²⁴ Kuwait uses a significant amount of fuel oil in its electric power sector, although the higher supply of natural gas over the past decade has replaced some of the fuel oil and direct crude oil burn for electricity generation.²⁵
- As of May 2023, Kuwait had the capacity to process 1.2 million b/d of crude oil from its three refineries (Table 3).²⁶ In late 2021, Kuwait's national oil company (KPC) completed its Clean Fuels Project, which upgraded the Mina Al-Ahmadi and Mina Abdullah refineries to be able to process petroleum products with low levels of sulfur and nitrogen oxide and to reduce overall carbon emissions.²⁷ Kuwait commissioned the sizeable Al Zour refinery, one of the Middle East's largest refineries, in November 2022 and brought online the plant's second crude oil distillation unit in March 2023.²⁸ KPC expects to make the last unit operational in the second half of 2023, which will raise Kuwait's total refining capacity to 1.4 million b/d.²⁹ Kuwait's higher refining capacity is likely to divert some of its crude oil cargo exports to domestic use and result in higher oil product exports in 2023 and beyond. The Al Zour refinery produces significant amounts of low

sulfur fuel oil, which Kuwait plans to use for its power plants when international natural gas prices are high.³⁰

Table 2. Kuwait's oil and natural gas projects

Project name	Additional oil production capacity (thousand b/d)	Additional natural gas production capacity (Bcf)	Announced start date	Notes
Jurassic natural gas field Phase 2	120	114	2018	Installation of three early production facilities (EPFs)
Jurassic EPF-50 expansion	N/A	13	2018	Expansion of the original facility supporting the 2010 Jurassic Gas Project
Lower Fars heavy oil project Phase 1	60	N/A	2020	South Ratqa field in northern Kuwait
GC-31 gathering facility	100	23	2021	Gathering center located in northern Kuwait
Khafji oil field in the Neutral Zone	N/A	9	2021	Natural gas pipeline from the offshore field installed
Khafji oil field in the Neutral Zone Phase 2	N/A	6	2023	Second phase of the pipeline completed
Wafra oil field in the Neutral Zone	N/A	15	2022	Natural gas first captured from Wafra to be used for field operations and Kuwait's power grid
Jurassic natural gas field—EPF 3 expansion	10	38	2024	
Jurassic natural gas field Phase 3—EPF 4 and 5	100	110	2024	
Burgan GC-32 gathering facility	120	30	TBA	Project to increase Burgan oil field capacity; operated by Petrofac; under construction
Umm Niqa heavy oil field expansion	30	N/A	2030	
Lower Fars heavy oil project Phase 2	210	N/A	2040	South Ratqa field in northern Kuwait; project not yet sanctioned

Durra natural gas field	42	183	TBA	Kuwait and Saudi Arabia agreed to co-develop the field in 2022. Oil and natural gas production are Kuwait's shares only
Total	792	541		

Data source: *Middle East Economic Survey*, Fitch Solutions, Rystad Energy, Reuters, Kuwait Oil Company.

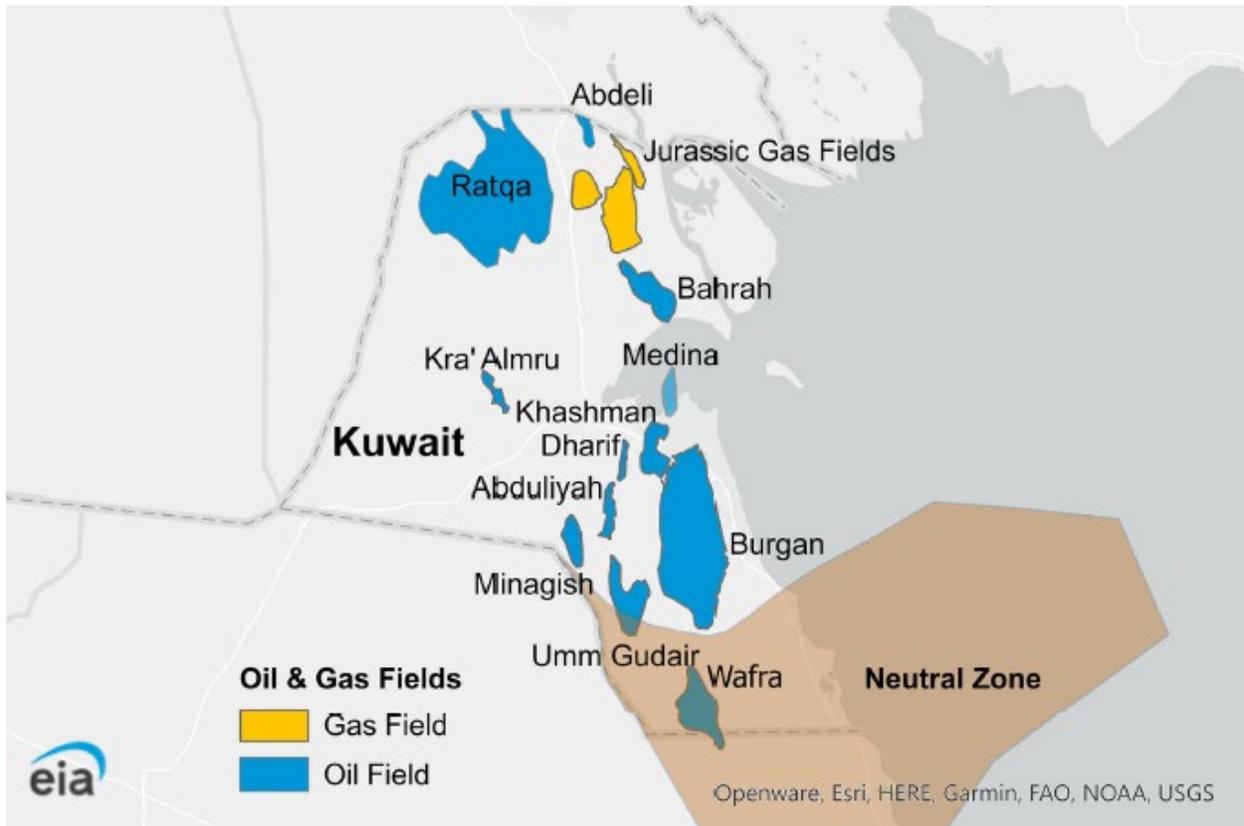
Note: b/d=barrels per day, Bcf=billion cubic feet, N/A=not applicable, TBA=to be announced.

Table 3. Kuwait's oil refining capacity, 2023

Refinery	Owners	Capacity (thousand barrels per day [b/d])	Notes
Crude oil and condensate refineries			
Mina Abdullah	Kuwait National Petroleum Corporation	454	Clean Fuels Project upgrade for refinery completed September 2021
Mina Al-Ahmadi	Kuwait National Petroleum Corporation	346	Clean Fuels Project upgrade for refinery completed August 2020
Al Zour Unit 1	Kuwait Integrated Petroleum Industries Company	205	Became operational in November 2022 with 205,000 b/d of capacity
Al Zour Unit 2	Kuwait Integrated Petroleum Industries Company	205	Became operational in March 2023 with 205,000 b/d of capacity
Al Zour Unit 3	Kuwait Integrated Petroleum Industries Company	205	Expected online in the second half of 2023
Total		1,415	

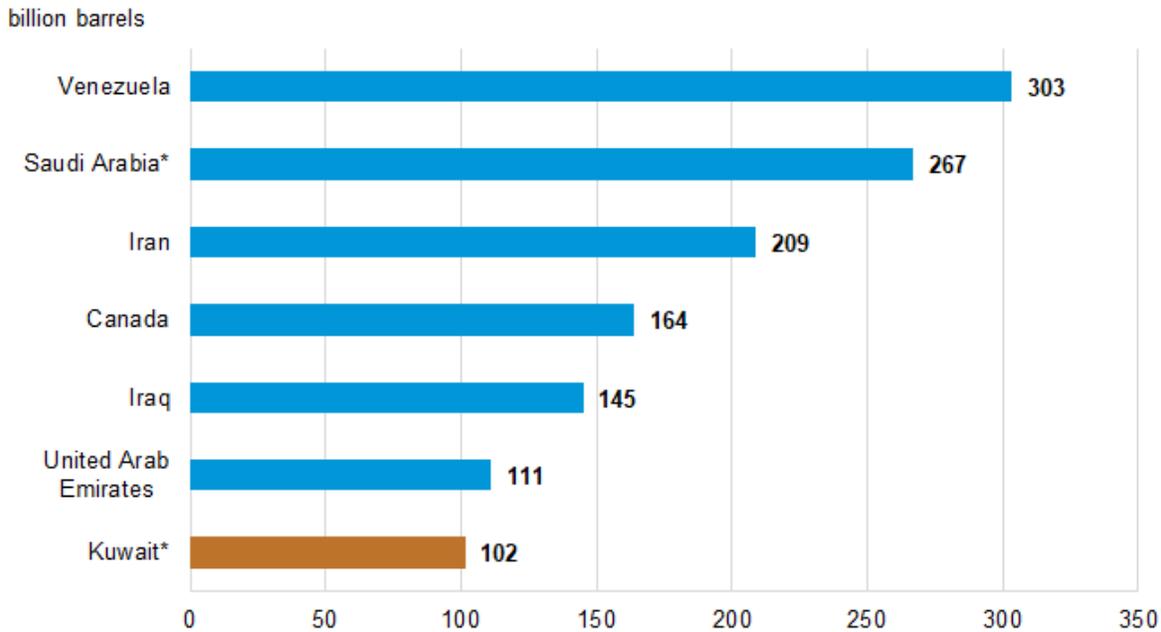
Data source: *Oil and Gas Journal*, FACTS Global Energy, and *Middle East Economic Survey*

Figure 1. Kuwait's key oil and natural gas fields



Data source: U.S. Department of Energy, National Energy Technology Laboratory and U.S. Energy Information Administration

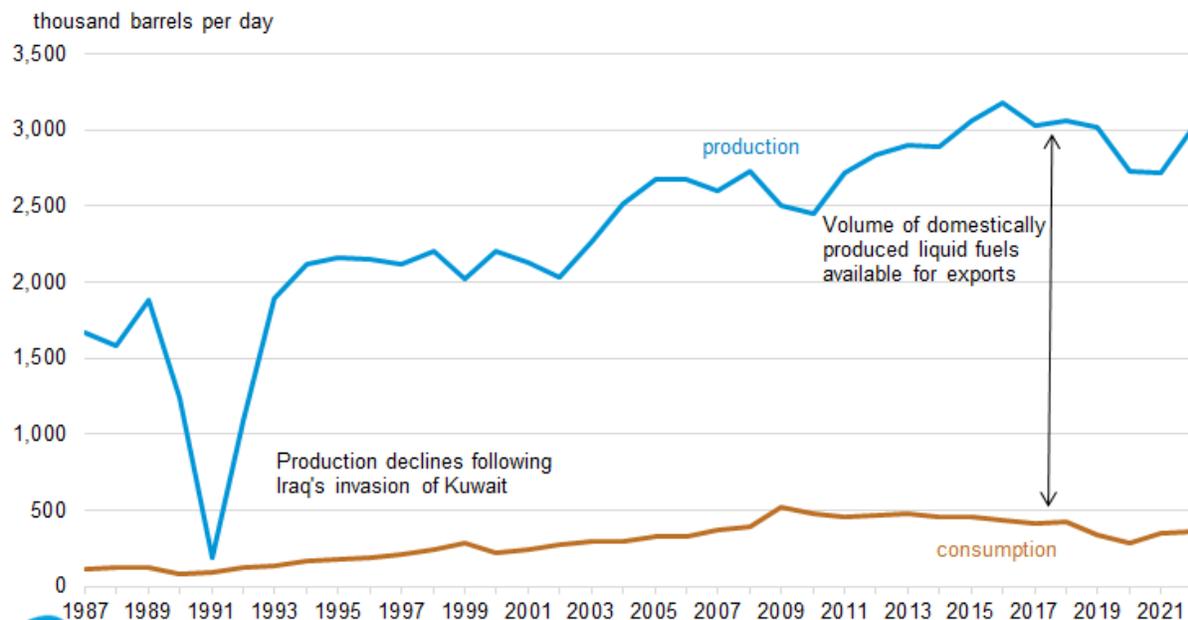
Figure 3. Top proved world oil reserves, 2022



Data source: *Oil & Gas Journal*, December 2022

Note: *Reserve volumes include those from the Neutral Zone

Figure 4. Kuwait's petroleum and other liquids production and consumption, 1987-2022



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook* June 2023

Natural Gas

- Although Kuwait's estimated proved natural gas reserves were low compared with its neighbors in the Middle East, it ranked in the top 20 countries in the world. Kuwait held 63 trillion cubic feet (Tcf) of proved natural gas reserves as of December 2022 (Figure 5).³¹ About 70% of Kuwait's natural gas production was from fields associated with oil production in 2021.³²
- Even though Kuwait's natural gas production rose significantly after 2010, its domestic demand growth outpaced production during the same time frame. Kuwait became the leading liquefied natural gas (LNG) importer in the Middle East.³³ Kuwait's natural gas production fell from 691 billion cubic feet (Bcf) in 2019 to 664 Bcf in 2021 because the OPEC+ member had to reduce its associated gas output in line with its oil production cuts (Figure 6). In 2022, production rose back to the 2019 averages as oil production and therefore associated gas cuts were reversed during most of 2022. We expect natural gas production to remain tempered in 2023 because of Kuwait's oil cuts made in late 2022 and early 2023.
- Kuwait intends to increase its natural gas production through the development of natural gas fields not associated with crude oil production.³⁴ As part of this goal, Kuwait is expanding the Jurassic natural gas field production in the northern region by 110 Bcf in 2024 (Table 2).
- Kuwait and Saudi Arabia signed an agreement in 2022 to develop the large Durra natural gas field located offshore near the Neutral Zone. The countries aim to produce 365 Bcf/y of natural gas and 84,000 b/d of condensate, which would be split between them. Development of the Durra field could face delays because Iran also claims the field is in its territorial waters.³⁵
- Kuwait's natural gas consumption increased by 52% between 2014 and 2022 after the most recent fossil-fuel-fired power plant, the Az Zour natural gas-fired power plant, came online in 2015.³⁶ The domestic power plants, water desalination plants, petrochemical and other industries, and the oil sector heavily use natural gas for fuel.³⁷ Kuwait plans to replace some of its oil-fired power generation with natural gas-fired generation to reduce its carbon dioxide emissions and to free up more crude oil and oil products for exports.³⁸
- Because the demand for natural gas outpaced its production, Kuwait began to import LNG in 2009 at a floating and regasification vessel docked at Mina Al-Ahmadi.³⁹ The Kuwait Integrated Petroleum Industries Company, a state-owned firm, commissioned the large-scale, onshore Al-Zour regasification terminal in mid-2021, which replaced the floating vessel at Mina Al-Ahmadi.⁴⁰ The Al-Zour import terminal can help the electric power sector pivot even more away from oil and toward natural gas for fuel. A second phase came online in early 2022, which raised Kuwait's total LNG importing capacity to more than 1.1 Tcf (Table 4).⁴¹

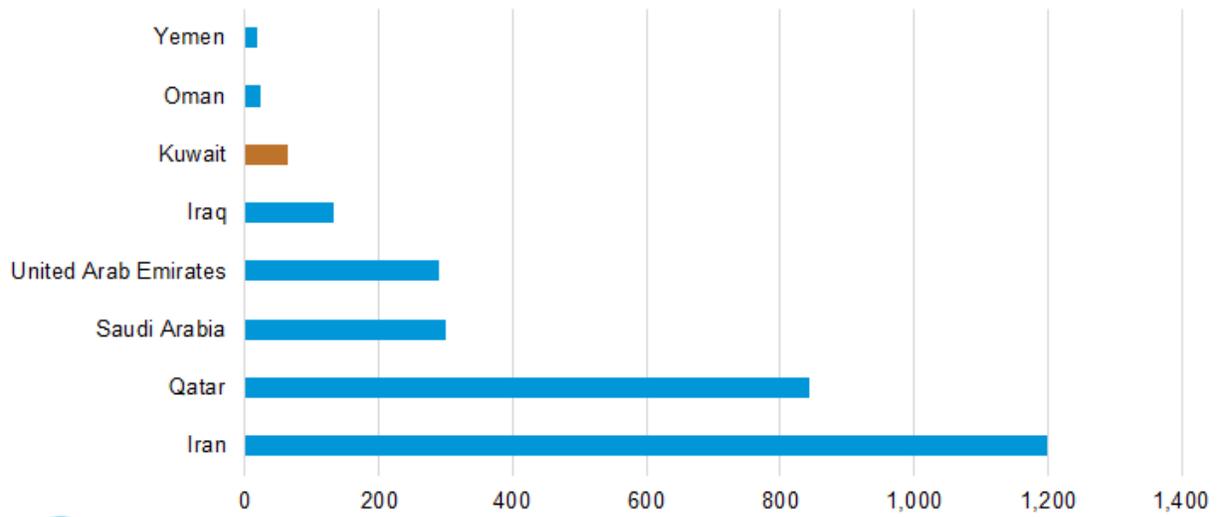
Table 4. Kuwait’s existing regasification terminals

Project name	Owners	Nameplate capacity (billion cubic feet per year)	Operational start year
Existing LNG import terminals			
Al-Zour LNG Phase 1	Kuwait Petroleum Corporation	528	July 2021
Al-Zour LNG Phase 2	Kuwait Petroleum Corporation	528	February 2022
Total		1,056	

Data source: International Gas Union, *2022 World LNG Report*, *Middle East Economic Survey*, Rigzone, Arab Times
 Note: LNG=liquefied natural gas

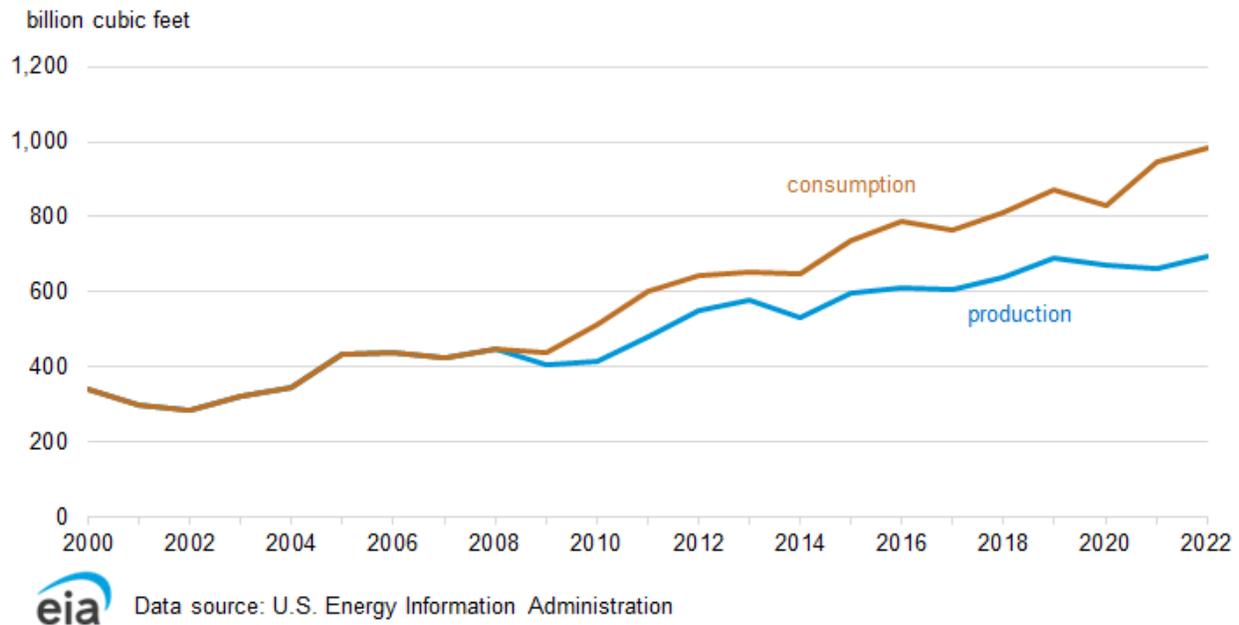
Figure 5. Largest proved reserve holders of natural gas in the Middle East, 2022

trillion cubic feet



eia Data source: *Oil & Gas Journal*, December 2022

Figure 6. Kuwait natural gas production and consumption, 2000-2022



Electricity

- Kuwait's electric power generation capacity was 20 gigawatts (GW) in 2021 and rose 7% between 2016 and 2021. The country's net electricity generation rose at a similar pace, about 8%, in the same period (Figure 7).⁴² Population growth, increasing water desalination, and high summer temperatures raised electricity consumption.⁴³ The Kuwaiti government heavily subsidizes electricity rates for consumers.⁴⁴ Because of its high electricity subsidies, which make electricity cheaper for consumers, Kuwait had the fifth-highest electricity generation per capita in the world and the third-highest in the Middle East in 2021.⁴⁵
- Kuwait generated more than 71 terawatt-hours (TWh) of net electricity in 2021 (Figure 7), and virtually all of it came from natural gas, fuel oil, and (to a smaller degree) direct burn crude oil.⁴⁶ Although Kuwait's electricity demand fell in 2020 because of the effects of the COVID-19 pandemic on mobility, the economy, and oil production, demand resumed growth in 2021.⁴⁷ We assess that the rise in oil production⁴⁸ and economic growth⁴⁹ in 2022 led to higher annual electricity output.
- Although Kuwait currently has sufficient electricity capacity, its peak demand in the summer is rising close to the country's available capacity and could soon strain the power system. Kuwait proposed expanding its power production capacity by nearly 13 GW through several projects to meet the growing demand.⁵⁰ Most of these projects are highly efficient combined-cycle natural gas-fired units, and one project uses solar energy for fuel. The political stalemate and regulatory issues have delayed all of these projects over the past decade.⁵¹
- Kuwait produces a negligible amount of electricity from renewable energy, mainly from solar energy. However, the Kuwaiti government's goal is to diversify its energy sources and to produce 15% of its power supply, which it estimates to be around 4.5 GW, from renewable energy by 2030.⁵² Bolstering its renewable energy, reducing electricity demand through higher efficiencies, switching from oil to more natural gas use, and using carbon capture technology are

part of Kuwait's plan to reduce its carbon emissions by 7.4% by 2035 (in a business-as-usual scenario) and to become carbon neutral by 2060.⁵³

- In 2019, Kuwait opened its first utility-scale solar and wind powered project, the 70-megawatt first phase of the Al-Shygayah power project.⁵⁴ The next phases of this project are slated to bring online at least 3.5 GW of solar capacity (Table 5), and it will displace some of the oil-fired electricity.

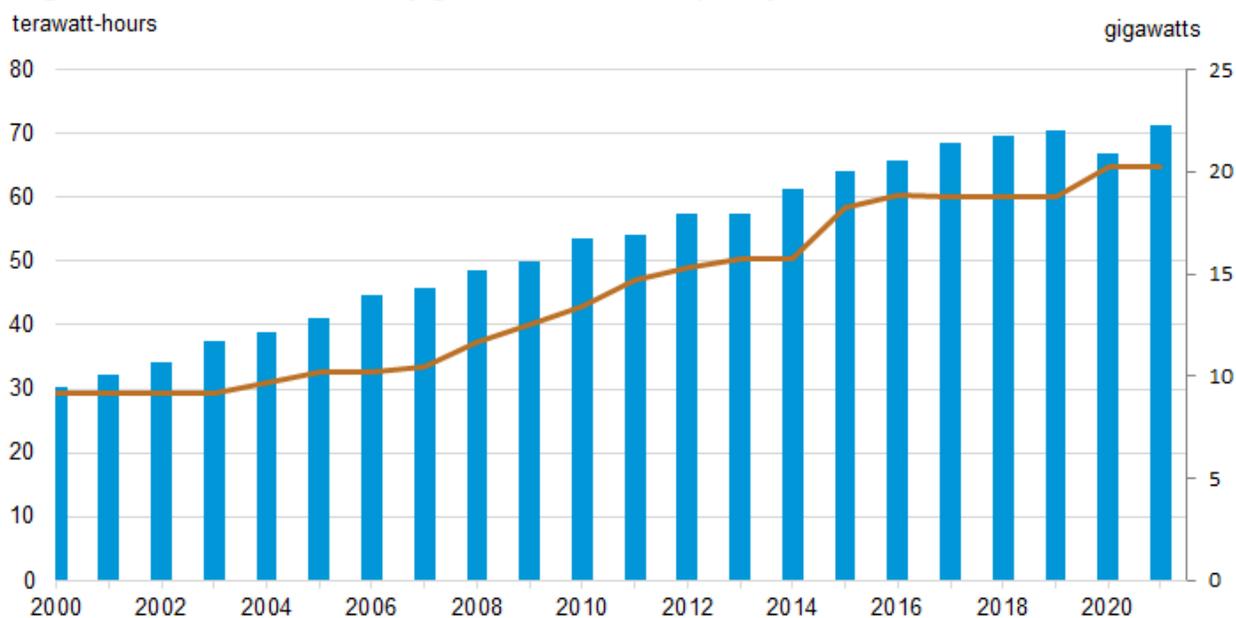
Table 5. Kuwait's planned power plants

Project name	Fuel	Capacity (megawatts)	Notes
Az-Zour North Phases 2 and 3	Natural gas	2,700	CCGT plant
Al-Khiran Phase 1	Natural gas and oil	1,800	Gas turbine
Al Sabiya Phases 2 and 4	Natural gas	1,150	CCGT plant
Nowaiseeb Phase 1	Natural gas	3,600	CCGT plant
Al-Shygaya Renewable Energy Phases 2 and 3	Solar	3,500	
Kabd project	Waste to energy	80	
Total		12,830	

Data source: Kuwait's Ministry of Electricity & Water & Renewable Energy, Saudi Gulf Projects, *Middle East Economic Survey*, *Times Kuwait*, Power Technology

Note: CCGT=combined-cycle gas turbine

Figure 7. Kuwait's electricity generation and capacity, 2000-2021



Data source: U.S. Energy Information Administration, International Energy Statistics

Energy Trade

Petroleum and other liquids

- Kuwait only occasionally imports crude oil and petroleum products because the country's oil production and refining sectors more than meet domestic demand.⁵⁵
- Kuwait's crude oil and condensate exports have hovered around 1.9 million b/d since 2020; the vast majority are sent to Asia, and small amounts are sent to Egypt and the United States (Figure 8).⁵⁶ The share of Kuwait's crude oil travelling to China rose significantly in the past decade from around 9% in 2013 to 31% in 2022. Vietnam began importing crude oil from Kuwait in 2017 when Vietnam's largest refinery (35.1% owned by Kuwait Petroleum Corporation) began operations.⁵⁷ The share of exports headed to the United States, which accounted for 16% of Kuwait's crude oil exports in 2013, fell to 1% in 2022 because U.S. crude oil and condensate production rose substantially during this period.⁵⁸
- Kuwait's crude oil exports are likely to decline in 2023 because of the higher domestic demand for crude oil by the new Al-Zour refinery. Kuwait is slated to produce and export more petroleum products, particularly diesel, fuel oil, and naphtha.⁵⁹
- In 2022, Kuwait's oil product exports rose to around 650,000 b/d from 530,000 b/d the year before.⁶⁰ The additional refinery capacity from refurbishments at original refineries and commissioning of the Al-Zour facility allowed Kuwait to produce and export more petroleum products. Europe and East Africa increased their imports of oil products from Kuwait (Figure

9).⁶¹ Europe is looking to replace diesel and other products that it used to receive from Russia before Europe sanctioned Russia's oil product cargoes.

- More than 90% of Kuwait's oil product exports were liquefied petroleum gas (LPG), diesel, jet fuel, and naphtha. Exports of relatively cleaner products such as jet fuel and diesel have increased since 2019, and fuel oil exports have declined.⁶² Kuwait can produce more middle distillates after its Clean Fuels Project refinery upgrade project, and it uses fuel oil domestically for its power plants.

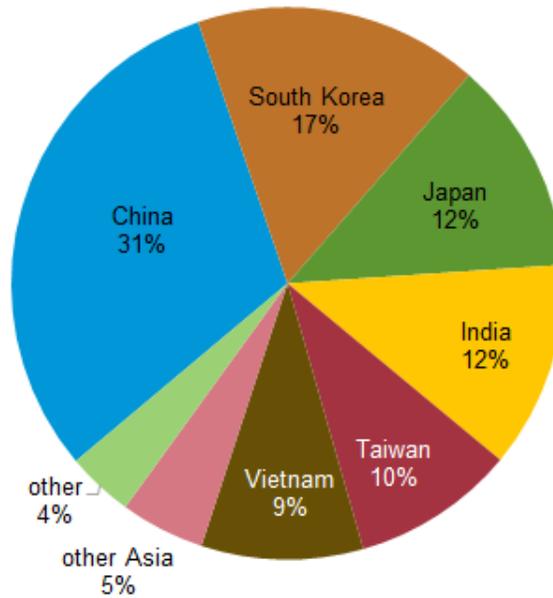
Natural gas

- Kuwait's natural gas production growth has not kept pace with its demand, and it began to import natural gas in 2009. In 2021, Kuwait was the largest importer of LNG in the Middle East,⁶³ and the third-largest importer of total natural gas (including LNG and pipeline natural gas) in the Middle East behind the UAE and Iraq.⁶⁴ Kuwait's natural gas imports rose substantially after 2018 because of escalating demand for natural gas-fired power generation (especially during summer months), reduced associated natural gas production because of OPEC+ oil production cuts in 2020, and the inauguration of the Al-Zour LNG import terminal in mid-2021.⁶⁵
- In 2022, Kuwait received about half of its LNG from regional suppliers, primarily Qatar (Figure 10). The UAE began to send Kuwait LNG cargoes in 2021.⁶⁶ After the United States began exporting LNG in 2016, it quickly became a significant natural gas exporter to Kuwait.⁶⁷
- Kuwait signed its first long-term LNG contracts with QatarEnergy and Shell for up to 288 Bcf/y to supply the Al-Zour terminal for 15 years.⁶⁸

Electricity

- As a member of the Gulf Cooperation Council Interconnection Authority (GCCIA), Kuwait trades small amounts of electricity with its neighbors. The main transmission line connecting Al Zour in Kuwait to Saudi Arabia has a capacity of 1.2 GW.⁶⁹ The GCCIA also intends to extend the transmission line north from Kuwait to Iraq. The additional 1.8 GW of capacity to Iraq is slated to be completed by 2025.⁷⁰

Figure 8. Kuwait's crude oil and condensate exports by destination, 2022

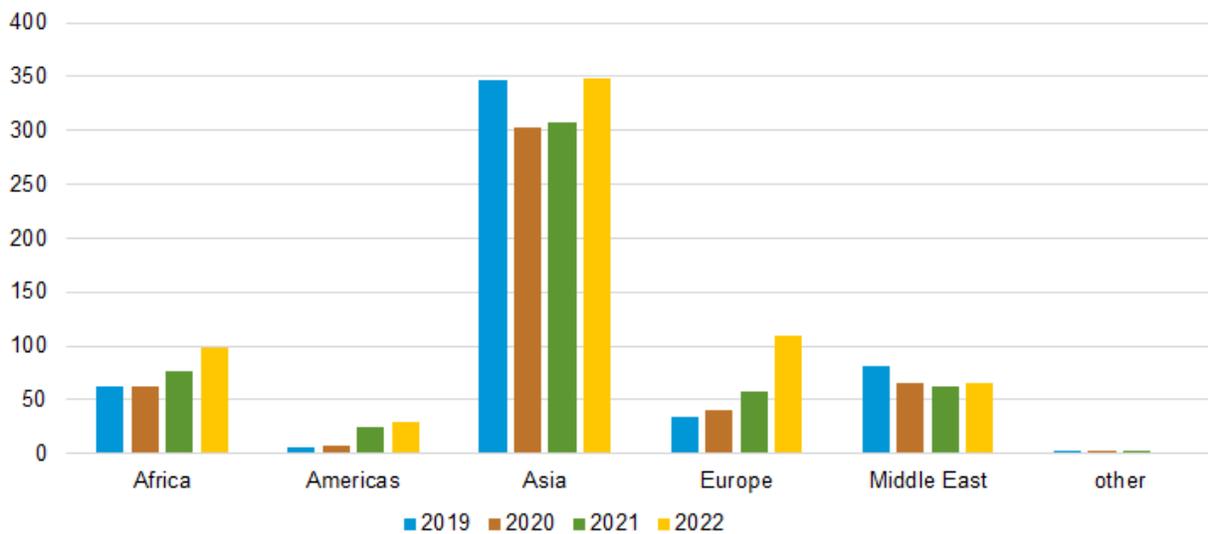


Data source: Kpler (accessed March 2023)

Numbers may not add to 100% because of independent rounding.

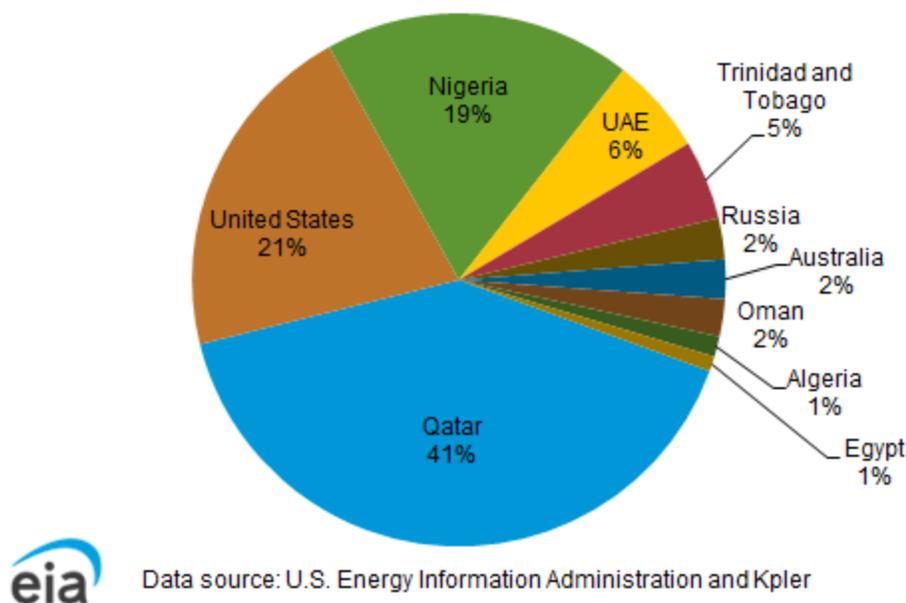
Figure 9. Kuwait's oil product exports by destination, 2019-2022

thousand barrels per day



Data source: Kpler (accessed April 2023)

Figure 10. Kuwait's LNG imports by source, 2022



¹ *Oil & Gas Journal*, Worldwide look at reserves and production (December 2022).

² U.S. Energy Information Administration, *Short-Term Energy Outlook*, June 2023.

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⁷ International Monetary Fund, [Country Report No. 22/89, Kuwait, 2021 Article IV Consultation](#), March 2022, pages 31-32.

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⁹ U.S. Energy Information Administration, [OPEC Net Oil Export Revenues](#), June 2023.

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¹¹ U.S. Energy Information Administration, International Energy Statistics.

¹² *Oil & Gas Journal*, Worldwide look at reserves and production (December 2022).

- ¹³ U.S. Energy Information Administration, *Short-Term Energy Outlook*, June 2023.
- ¹⁴ U.S. Energy Information Administration, *Short-Term Energy Outlook*, June 2023.
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- ¹⁷ U.S. Energy Information Administration, *Short-Term Energy Outlook*, June 2023.
- ¹⁸ OPEC, Press Releases, “[35th OPEC and non-OPEC Ministerial Meeting](#),” June 4, 2023; Maha El Dahan, Alex Lawler and Ahmad Ghaddar, Reuters, “[Saudi pledges big oil cuts in July as OPEC+ extends deal into 2024](#),” June 4, 2023; Qatar News Agency, “[Kuwait to Continue Voluntary Oil Output Reduction until End of 2024](#),” June 5, 2023.
- ¹⁹ Energy Intelligence, World Crude Oil Data, [Kuwait](#), [Kuwait: Kuwait](#), [Kuwait: Kuwait Super Light](#), [Kuwait: Kuwait Export Heavy](#) (accessed May 2023).
- ²⁰ U.S. Energy Information Administration, *Short-Term Energy Outlook*, June 2023.
- ²¹ *Middle East Economic Survey*, “Kuwait Targets 2030 For Delivery of \$19bn in Megaprojects,” May 12, 2023.
- ²² *Middle East Economic Survey*, “Kuwait Upstream Costs Soar,” July 22, 2022.
- ²³ Kuwait Petroleum Corporation, [Strategy](#) (accessed June 2023).
- ²⁴ U.S. Energy Information Administration, *Short-Term Energy Outlook* June 2023.
- ²⁵ FACTS Global Energy, Databook 4: Middle East Petroleum Databook, Spring 2023, page 47 and Datasheets-S23-ME-Product Demand; Fitch Solutions, Kuwait Oil & Gas Report, Q3 2023, pages 30-31.; Fitch Solutions, Kuwait Power Report, Q3 2023, page 10.
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- ³¹ *Oil & Gas Journal*, Worldwide look at reserves and production, (December 2022).
- ³² Kuwait Oil Company, Annual Report 2020-2021, page 26.
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