



Country Analysis Brief: Iraq

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Overview

Table 1. Iraq's energy overview, 2021

	Crude oil and other					Other renewables	Total
	petroleum liquids	Natural gas	Coal	Nuclear	Hydro		
Primary energy consumption (quads) 2021 ^a	1.3	0.7	--	--		0.1	2.1
Primary energy consumption (percentage)	62.1%	32.6%	--	--		5.3%	100.0%
Primary energy production (quads) 2021 ^a	8.8	0.4	--	--		<0.1	9.2
Primary energy production (percentage)	95.2%	4.3%	--	--		0.5%	100.0%
Electricity generation (terawatthours) ^b 2022		130.8	--	--	2.7	0.4	133.9
Electricity generation (percentage)		97.7%	--	--	2.0%	0.3%	100.0%

Data source: U.S. Energy Information Administration, *Energy Institute Statistical Review of World Energy Data*

Note: Quads=quadrillion British thermal units; -- signifies not applicable.

^a Hydropower and solar are combined, and hydropower accounts for the majority.

^b Includes only Federal Iraq. Estimates not yet published by U.S. Energy Information Administration, International Energy Statistics.

- Iraq (Federal Iraq and Kurdistan Regional Government) is the second-largest crude oil producer in OPEC after [Saudi Arabia](#) and the sixth-largest total petroleum liquids producer in the world.¹ It holds the world's fifth-largest proved crude oil reserves, at 145 billion barrels, representing 17% of proved reserves in the Middle East and 8% of global reserves (Figure 1).² Most of Iraq's major known fields—all of which are located onshore—are producing or are in development.³ Most of Iraq's crude oil is located in the southern Basra region, the Diyala region east of Baghdad, and the northeastern Kirkuk region.⁴
- After holding parliamentary elections in October 2021, Federal Iraq took a year to form a consensus government under the leadership of Mohammed Shia al-Sudani. This government gridlock delayed key legislation, the passing of an annual budget, and financing for major energy projects by the government and foreign investors.⁵ After not having a budget for 2022, Iraq approved annual budgets for 2023, 2024, and 2025 in June 2023 that included funding for infrastructure projects.⁶
- Crude oil export revenues account for a large part of Iraq's economy. In 2022, crude oil export revenue accounted for an estimated 95% of Iraq's total government revenues, according to the International Monetary Fund (IMF).⁷ Iraq's net oil revenues rose to \$131 billion in 2022 from \$92 billion (2022 dollars) in 2021, driven by higher oil prices and increased production.⁸ We expect that the decrease in global oil prices and lower crude oil production in Iraq in 2023 (following the OPEC+ cuts and supply disruptions in northern Iraq) will significantly decrease Iraq's oil export revenues.⁹
- Iraq consumed an estimated 2 quadrillion British thermal units of total primary energy in 2021, making it the fifth-largest energy consumer in the Middle East behind Iran, Saudi Arabia, the United Arab Emirates, and Qatar.¹⁰ Natural gas and oil accounted for almost all of Iraq's total

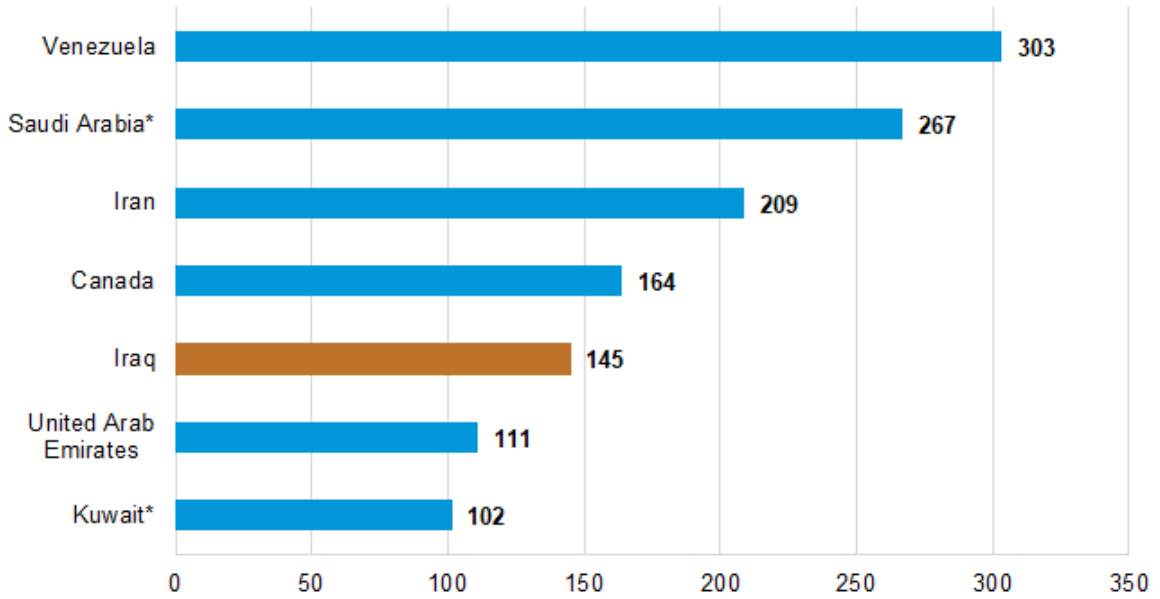
primary energy consumption; hydropower and solar energy contributed marginally (Figure 2). Iraq will continue to mostly use oil to meet energy demand until it develops more natural gas processing capacity and pipeline infrastructure.

Kurdistan Regional Government and Federal Iraq

- Federal Iraq refers to the political entity that is governed by the central government of Iraq in Baghdad. The Kurdistan Regional Government (KRG), the official ruling body of the semi-autonomous region in northern Iraq that is predominantly Kurdish, has been involved in disputes with the central government related to sovereignty for about three decades.
- KRG oil production fell after reaching nearly 470,000 barrels per day (b/d) in 2019 to less than 440,000 b/d by 2022.¹¹ The KRG's payment delays to international oil companies (IOCs) over the past few years, along with the region's exploration fields that have not yielded expected results drove these declines. As a result, IOC investment over time in exploration and field development has declined.¹²
- We expect that 2023 crude oil production from the KRG will decline on an annual basis because of the Iraq-to-Turkey (ITP) pipeline closure at the end of March 2023 and the limited outlets to sell crude oil production locally to refiners (see the Energy Trade section for more details). Although most of the production in northern Iraq was shut in or placed into storage after the pipeline stopped operating, the KRG fields increased production from nearly 120,000 b/d in April 2023 to around 200,000 b/d in August 2023. This crude oil travels mostly to northern refineries, although these outlets have reached their capacity.
- Federal Iraq's 2023 budget stipulates that the KRG release 400,000 b/d of crude oil to Federal Iraq in return for a portion of the federal budget. However, the closure of the pipeline from the KRG to Turkey in March 2023 hampers the KRG's ability to produce 400,000 b/d because of the limited outlets to southern Iraq. The KRG sent around 85,000 b/d to Federal Iraq in August 2023, up from 35,000 b/d in July. Federal Iraq sends this volume to the refinery in Erbil for processing and local consumption.¹³ Following the Iraq-to-Turkey pipeline closure, the KRG has had a hard time making a profit and has received loans from Federal Iraq over the past several months to pay civil servant salaries.¹⁴
- The IOCs that are producing crude oil in the KRG region have to sell their crude oil production for much lower revenues than before the ITP pipeline closed. Federal Iraq's new budget does not compensate these producers with the revenues they previously received from their contracts with the KRG. IOCs are requesting that they be compensated based on the agreement with the KRG, and the lack of resolution likely will affect future investment and the ability to raise production if and when the ITP reopens.¹⁵

Figure 1. Top proved world oil reserves, 2022

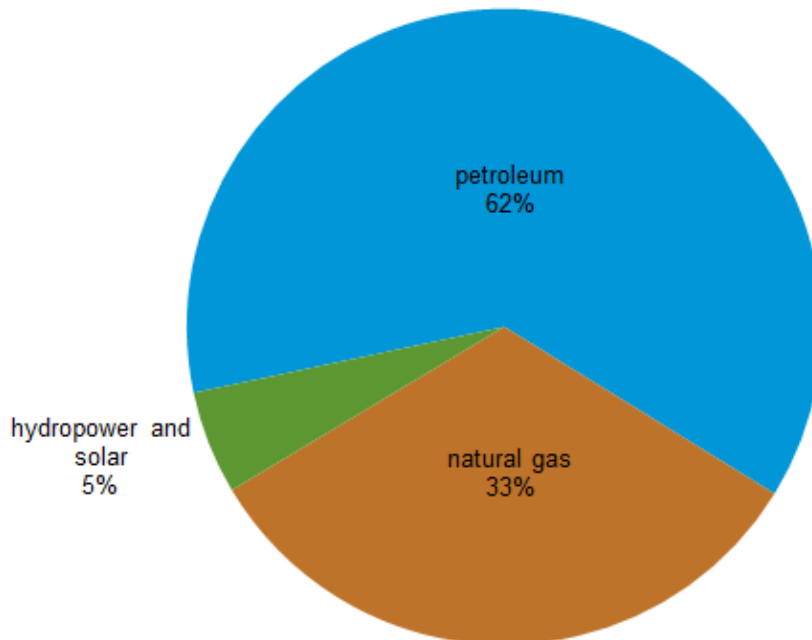
billion barrels



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

Note: *Reserve volumes include those from the Neutral Zone.

Figure 2. Iraq's total primary energy consumption, share by fuel, 2021



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

Petroleum and Other Liquids

- Iraq, one of the members of the [OPEC+ agreement](#), raised its crude oil output (excluding condensates) in 2022 by nearly 400,000 barrels per day (b/d) from an average of less than 4.1 million in 2020 and 2021 to more than 4.4 million b/d, after the OPEC+ members reversed the significant production cuts made in 2020. The central government in Baghdad produced about 4 million b/d, and the KRG supplied less than 440,000 b/d from the northern fields that it currently operates.¹⁶ Iraq (including the KRG) produced, on average, almost 4.6 million b/d of total petroleum liquids in 2022 (Figure 3).¹⁷
- Iraq's crude oil production fell to 4.3 million b/d in the first half of 2023, and we expect that Iraq's 2023 crude oil production will be lower than in 2022 because of the OPEC+ production cuts made in November 2022 and voluntary reductions made by Iraq in 2023.¹⁸ In June 2023, OPEC+ agreed to extend crude oil production cuts through 2024, and Iraq's government announced that it will continue voluntary production cuts through 2024, which would leave Iraq's production target at about 4.2 million b/d.¹⁹
- We estimate that Iraq's effective crude oil production capacity was 4.4 million b/d as of mid-2023, down from 4.8 million b/d at the beginning of 2023. The addition of a new refinery and restoration of some equipment at the Basra export terminal boosted production capacity in 2023. However, the removal of around 400,000 b/d of export capacity in northern Iraq more than offset any additions. Export infrastructure at the southern oil terminals is constrained, and midstream projects are often delayed because of insufficient investment and bureaucratic hurdles.²⁰
- Iraq's oil ministry plans to lift crude oil production capacity to 7 million b/d by 2027 and will target several upstream expansion projects from fields in southern Iraq to bolster the country's output (Table 2).²¹ Some of these projects are likely to be delayed because of Iraq's political struggles, regulatory challenges, delays in restoring and expanding the southern export infrastructure, and the international oil companies' uncertainty about the investment climate.
- Iraq's oil production requires more water injection to maintain its reservoir pressures and to increase oil production. TotalEnergies intends to invest in a 7.5 million b/d seawater conversion project as part of its energy agreement with Iraq to bolster oil production from mature fields in southern Iraq.²² Iraq finalized its agreement with TotalEnergies in July 2023, and the seawater conversion project is slated to come online in 2027, assuming no further project delays.²³
- Iraq consumed about 900,000 b/d of petroleum and other liquids in 2022.²⁴ Domestic refineries meet most of Iraq's petroleum product needs; however, Iraq imports some petroleum products, primarily gasoline and diesel.²⁵ Iraq also uses crude oil and high sulfur fuel oil for electric power generation.²⁶
- Iraq's total operating refining capacity is about 1.2 million b/d.²⁷ The Iraqi government plans to reduce petroleum product imports by rehabilitating the refining sector and building new refineries, but the government has struggled in its efforts to attract the foreign investment needed in the downstream sector. Iraq's refineries produce more heavy fuel oil than is needed domestically and not enough gasoline and diesel to meet domestic demand.
- Several new refineries are planned, along with capacity expansion and upgrades at a number of existing refineries, to alleviate domestic product shortages, reduce government import costs for oil products, and eventually increase exports of refined products.²⁸ Iraq brought online the 140,000 b/d-Karbala refinery in April 2023, although technical issues made the plant inoperable for part of the summer. The Karbala reached full capacity in September 2023.²⁹ Iraq plans to

commission two refinery projects in 2024. The South Refineries Company is expanding its Basra refinery by 70,000 b/d. However, an ongoing financial dispute between Iraq's refining company and the contractor is delaying the project.³⁰ Iraq also plans to repair a damaged 150,000 b/d-crude distillation unit at the Baiji refinery complex by the end of 2024.³¹ Other refinery projects are still in the planning stages, although Iraq's regulatory challenges and economic issues are hurdles for potential investors.³²

Table 2. Crude oil projects in Iraq, 2023

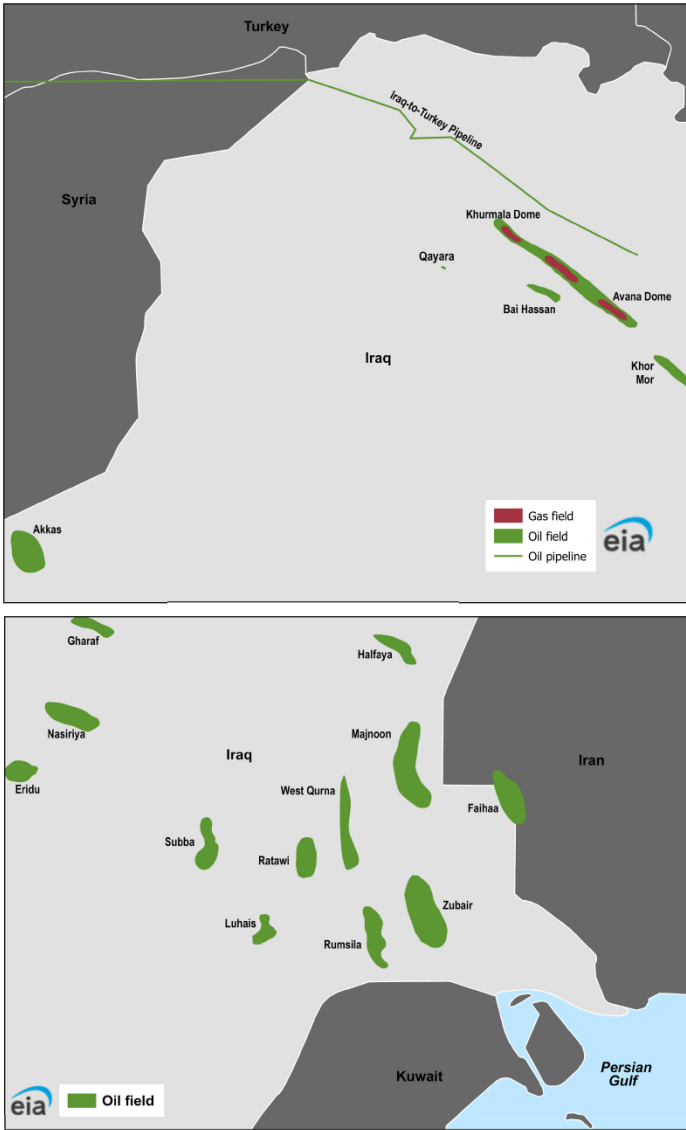
Field name	Operator or project investor	Additional capacity (thousands of barrels per day)	Announced start date	Notes
Missan Cluster (Bazergan, Fakka, and Abu Gharb fields)	China's CNOOC	100	November 2022	CNOOC expanded the Missan Cluster's capacity to 300,000 b/d in November 2022. ³³

Majnoon	Basra Oil Company	200	End-2023	Shell exited the field ownership in 2018. ³⁴
Zubair	ENI	50	End-2024	Any future expansions will require more water injection ³⁵
Faihaa crude oil processing facility	China's United Energy Group	100	Second half 2024	Located on the border with Iran. Plans include expanding the Faihaa field capacity from 50,000 barrels per day (b/d) to 130,000 b/d. The crude oil processing facility could also process oil from nearby fields. ³⁶
Ratawi	TotalEnergies	130	2025	Field expansion is part of TotalEnergies' \$27 billion deal signed in September 2021 with Iraq. Agreement was finalized in July 2023. Planned expansion of field capacity to 210,000 b/d. ³⁷
West Qurna-1	ExxonMobil and Basra Oil Company	330	2028	Iraq awarded a drilling contract to services firm Schlumberger. Iraq's dispute with ExxonMobil over the company's exit from the field's partnership and the uncertainty of Basra Oil Company's ability to invest in the expansion are likely to delay this project. ³⁸
Fields in the Dhi Qar province (Nasariya, Gharaf, and Subba)	Dhi Qar Oil Company (DQOC)	310	2028	Iraq began negotiations with Chevron in 2020 to explore and develop more fields in the Dhi Qar province. These fields produced an aggregate of about 220,000 b/d at the end of 2021, and Iraq targets a total production of 600,000 b/d. ³⁹ The negotiations have not progressed as of September 2023. DQOC raised capacity at Subba oil field from 10,000 b/d to 100,000 b/d in early 2023. ⁴⁰
Eridu	Lukoil	250	2028	The pilot phase will include 30,000 b/d starting in 2025 and lasting through 2028. The field's peak production target is set for 250,000 b/d. ⁴¹
West Qurna-2	Lukoil	330	2030	Capacity expansion includes the Yamama reservoir. The Mishrif reservoir increased from 350,000 b/d in 2021 to 480,000 b/d in mid-2023. A pilot project for Yamama began in 2021 and as of October 2023 was producing 30,000 b/d. ⁴²

Data source: *Middle East Economic Survey*, FACTS Global Energy Services, Rystad Energy, Al Arabiya News, and company websites

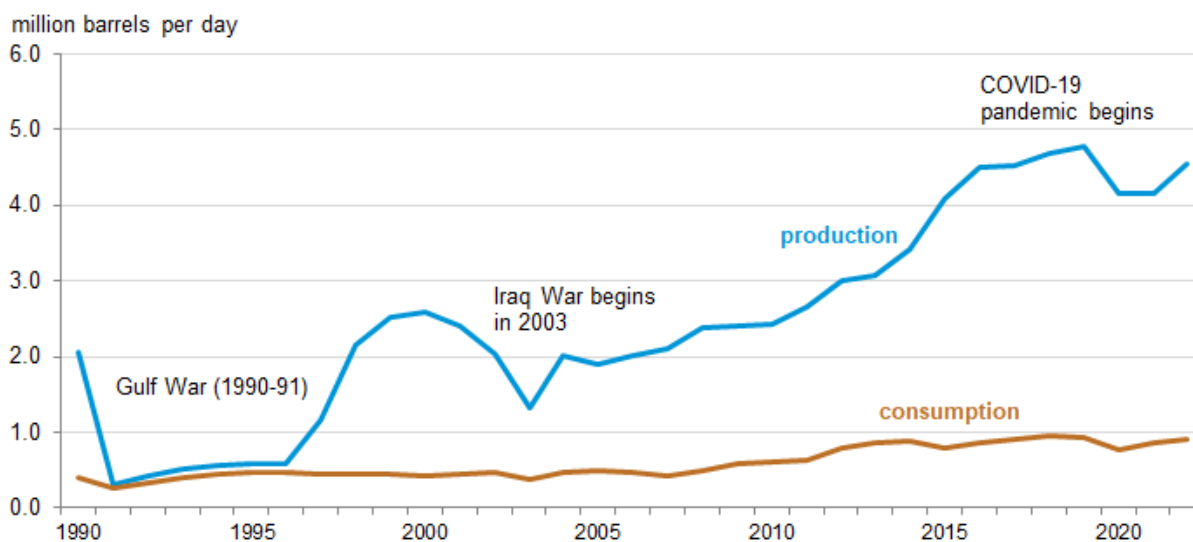
Note: b/d=barrels per day

Figure 3. Maps of Iraq’s Largest Oil and Natural Gas Fields in Northern and Southern Iraq



Data source: Esri, © OpenStreetMap contributors, HERE, Garmin, FAO, NOAA, USGS

Figure 4. Iraq's total petroleum and other liquids production and consumption



Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, September 2023

Natural Gas

- At nearly 131 trillion cubic feet (Tcf), Iraq's proved natural gas reserves at the end of 2022 were the 12th largest in the world.⁴³ Most of Iraq's natural gas reserves are associated with oil, and most of the associated natural gas is in large oil fields in southern Iraq.⁴⁴ Although Iraq has sizeable natural gas reserves, regulatory and investment hurdles and insufficient natural gas infrastructure have kept the amount of their natural gas production available for sale relatively flat since 2016 (Figure 5).
- About two-thirds of Iraq's natural gas output is associated natural gas, which is a byproduct of oil production.⁴⁵ Production cuts from Iraq's oil fields in early 2020, following the OPEC+ agreement, lowered associated natural gas output as well, and natural gas output was around 260 billion cubic feet per year (Bcf/y). In 2021, natural gas production returned to about 339 Bcf after production of both nonassociated natural gas from the Khor Mor field and associated natural gas rose (Figure 5). Iraq consumed 612 Bcf of dry natural gas in 2021, mainly for electric power generation. We expect that Iraq's natural gas consumption growth rose higher than production in 2022.⁴⁶ If Iraq commissions some of the natural gas processing plant projects scheduled to be online by 2024, natural gas production from associated natural gas fields will likely increase.
- According to the World Bank, Iraq flared more than 630 Bcf of natural gas in 2022, ranking as the second-largest source country of flared natural gas in the world, behind Russia.⁴⁷ Natural gas is flared because of insufficient pipeline capacity and other midstream infrastructure to move the natural gas from crude oil production areas. Iraq delayed its target to eliminate natural gas flaring to 2027.⁴⁸ If Iraq can mobilize the investment for capturing its associated natural gas, it

can use that natural gas to generate electricity, especially during the peak summer season. It could also reduce its natural gas imports from Iran.

- Iraq is pursuing several projects to capture associated natural gas production and is negotiating several agreements with various companies to raise the country's natural gas processing capacity from around 600 Bcf in mid-2023 to nearly 1.2 Tcf in 2027 (Table 3).⁴⁹
- Federal Iraq aims to not only capture and sell more associated natural gas but also to develop natural gas fields not associated with oil production to meet the country's demand and reduce reliance on Iran for natural gas imports (Table 3). The government is prioritizing the Akkas field in western Iraq and the Mansuriya field north of Baghdad as key nonassociated natural gas projects. Although Iraq is keen to develop these fields and the required natural gas processing infrastructure for them, these projects have encountered several delays over the past decade because of issues related to security, investment, contract terms, and commitment by international partners. In March 2023, the Akkas field began partial production at a rate of 22 Bcf/y to serve a local power plant, and Iraq intends to further develop the field using foreign investment and technology.⁵⁰
- The KRG has one nonassociated natural gas field, Khor Mor, with an operational capacity of 183 Bcf/y, which supplies power plants in Kurdistan (Table 3). UAE's Dana Gas, the operator of Khor Mor, began work on an expansion project that is slated to provide natural gas for domestic use in the electric power sector. Once domestic power demand is satisfied, additional capacity from the project could be exported to Turkey and the European Union or sent to power plants in northern Federal Iraq. However, new natural gas pipelines would be required to send the natural gas outside of the KRG. A series of rocket attacks in 2022 temporarily suspended work on the expansion project, but work resumed on the field expansion in early 2023.⁵¹

Table 3. Major natural gas projects in Iraq, 2023

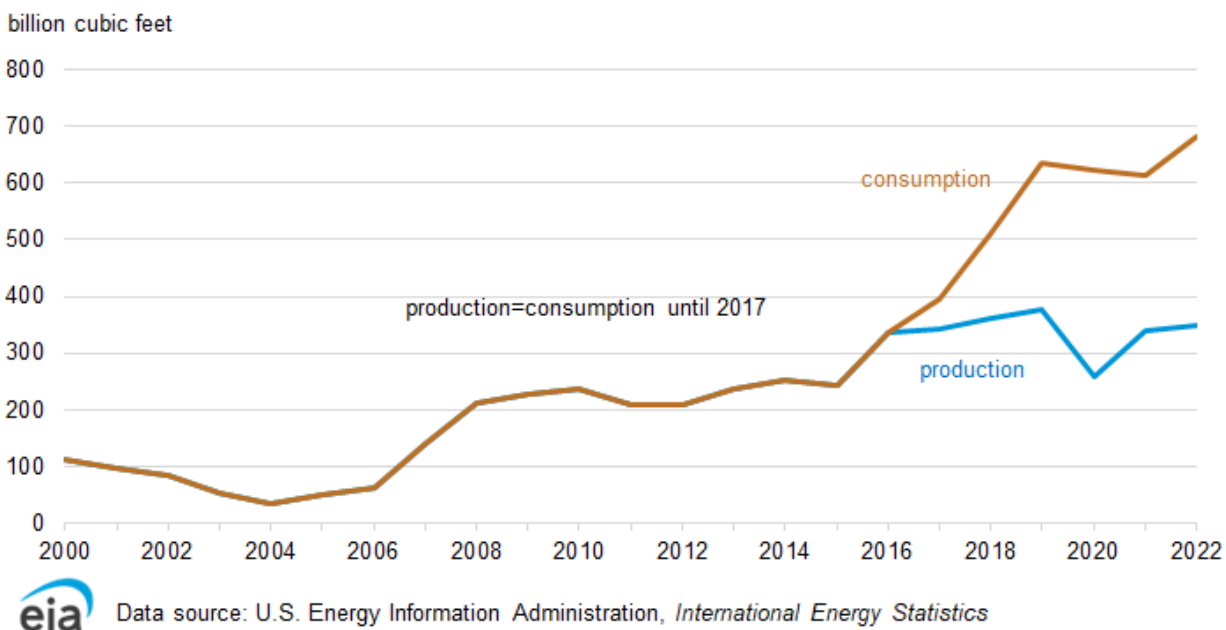
Project	Operator or project investor	Additional capacity (billion cubic feet per year)	Announced start date	Notes
Associated natural gas projects				
Halfaya natural gas processing plant	China's CNPC	110	Early 2024	Designed to capture flared gas from the large Halfaya oil field in Misan province. Natural gas will replace oil use in the region's electric power sector. ⁵²
Basra Natural Gas Liquids (BNGL) project	Basra Gas Company	73 bcf/y in Phase 1 and 73 bcf/y in Phase 2	Second-half 2023 and first-quarter 2024	The Basra Gas Company intends to add 73 Bcf/y for each phase at its BNGL project to process natural gas from the Majnoon, West Qurna-2, and Ratawi oil fields. ⁵³
Nassariya Gas Plant ⁵⁴	South Gas Company and Baker Hughes	73	Second-half 2024	Located in the Dhi Qar province and will process natural gas from the Nassariya and Gharaf oil fields.

Gas Growth Integrated Project	TotalEnergies	110 in Phase 1 and 110 in Phase 2	2026 and 2028	As part of TotalEnergies' deal in Iraq, the company plans to build a natural gas facility in two phases to gather and treat natural gas from the West Qurna-2, Majnoon, Ratawi, Tuba, and Luhais oil fields. ⁵⁵
Total		549		
Nonassociated natural gas projects				
Khor Mor expansion project	UAE's Dana Gas and Crescent Petroleum	91 in Phase 1 and 91 in Phase 2	Second-quarter 2024 and TBA	The KRG's sole nonassociated natural gas field, Khor Mor, has a capacity of 183 Bcf/y, which supplies power plants in Kurdistan. Dana Gas intends to expand capacity by 91 Bcf/y by mid-2024 and plans a second expansion at a later date. ⁵⁶
Akkas natural gas field	Iraq's Midland Oil Company	146 (22 Bcf/y began in March 2023)	2027	Located in the remote western province of Anbar, Akkas is designed to supply a nearby power plant. Production of 22 Bcf/y began in March 2023, but Iraq is seeking a partner to further develop the field and began discussions with Saudi Aramco in May 2023. ⁵⁷
Mansuriya natural gas field	TBA	110	TBA	Sinopec and Iraq's interim government agreed on a contract for Mansuriya natural gas field in January 2022, but the parties later disagreed on the contract terms. Sinopec exited the agreement, and Iraq is seeking a firm to replace Sinopec. ⁵⁸
Total		438		

Data source: *Middle East Economic Survey*, Iraq Oil Report, Argus Media, Rystad Energy, Reuters, Shafaq News, Dana Gas

Note: TBA=to be announced, Bcf/y=billion cubic feet per year

Figure 5. Iraq's natural gas production and consumption, 2000–2022



Electricity

- Federal Iraq generated an estimated 134 terawatt-hours (TWh) in 2022, up from 120 TWh in 2021.⁵⁹ Electricity output in 2022 increased because of the economic recovery following the COVID-19 pandemic and higher demand from the oil industry because of the upturn in oil production after the OPEC+ production cuts expired.⁶⁰ The KRG generated at most 17 TWh in 2023.⁶¹
- Nearly all (about 98%) of Iraq's electricity generation is from oil and natural gas.⁶² Natural gas use in the electric power sector increased after 2016 because Iraq began importing natural gas from Iran to increase its own supplies. Hydroelectricity accounts for most of the remaining share of electricity production.⁶³
- Since 2021, Iraq has started operating three thermal power plants with a combined capacity of 2.6 GW, and Iraq has plans to add 6 GW of new generation capacity by 2025. Iraq also plans to increase the energy efficiency of existing plants and other electric power sector infrastructure.⁶⁴
- Although solar generation accounted for an insignificant share of total power generation, Iraq plans to develop renewable energy projects to replace some of its oil and natural gas-fired capacity and to reduce natural gas and electricity imports from Iran (Table 4). Iraq plans to install 12 GW of renewable energy capacity by 2030 and signed agreements with several international companies to develop 4.5 gigawatts (GW) of utility-scale solar projects in 2021.⁶⁵
- Federal Iraq's available peak electricity generation supply was nearly 23 GW for 2022. The available supply in 2022 was much lower than the 34 GW needed to meet peak summer demand.⁶⁶ Iraq's electricity use is very seasonal and reaches peak capacity in the summer months. Generation plants run at low utilization rates, and the available or effective production capacity is much lower than installed capacity because of poor transmission infrastructure, inefficient or damaged power plants, and insufficient natural gas supply and infrastructure. Peak

summer demand typically exceeds actual generation, resulting in frequent power shortages that have caused protests each year since 2020.⁶⁷

- Iraq burns crude oil and fuel oil directly at power plants to make up for its limited feedstock of other power generation fuels. Iraq's reported average crude oil used at power stations rose from an average of 24,000 barrels per day (b/d) in 2021 to 149,000 b/d in 2022 as a result of insufficient natural gas-fired electricity generation (Figure 6).⁶⁸ Although Iraq's official reports of crude oil burn were low during recent years, we estimate that they used at least 100,000 b/d of crude oil for power generation since 2015.⁶⁹ In addition to crude oil, Iraq burns high sulfur fuel oil for power generation. Reported total oil-fired power generation in Iraq rose substantially in 2022 to around 360,000 b/d and reached a record high in June 2023 at 535,000 b/d.⁷⁰

Table 4. Iraq's solar power agreements

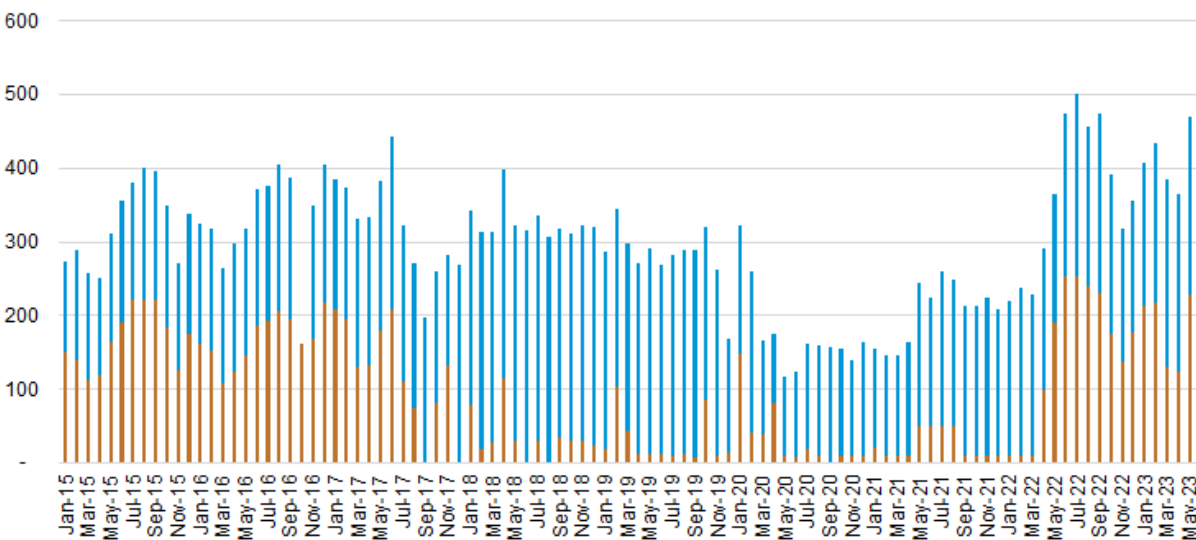
Operator or project investor	Capacity (megawatts)	Notes
Al-Bilal Group (UAE)	525	Iraq's cabinet approved the power purchase agreement (PPA) with Al-Bilal in July 2023. Located in central Iraq. ⁷¹
TotalEnergies	1,000	Part of TotalEnergies' \$27 billion energy deal with the Iraq government. Iraq's cabinet approved the PPA with TotalEnergies in May 2023. Three development phases supplying the Basra grid. ⁷²
PowerChina	750	Iraq's cabinet approved the PPA with PowerChina in May 2023. Two phases with 250 MW and 500 MW located in southern Iraq. Iraq initially signed an agreement with PowerChina for 2,000 MW of solar projects in October 2021.
UEG (China)	200	UEG is waiting for approval from the Basra Oil Company for the first phase of its solar project. ⁷³
Masdar (UAE)	1,000	Consists of five solar plants in Dhi Qar, Ramadi, Mosul, and Amarah. Masdar and Iraq signed an agreement in October 2021. ⁷⁴
ACWA Power (Saudi Arabia)	1,000	ACWA Power and Najaf province in central Iraq are part of a joint venture to develop this project. ⁷⁵
Total	4,475	

Data source: *Middle East Economic Survey*, Reuters, Zawya, Arab News

Note: MW=megawatts.

Figure 6. Crude oil and fuel oil used at power stations in Iraq

thousand barrels per day



Source: Joint Oil Data Initiative

Note: Assumes that all fuel oil consumption is from the electric power sector

Energy Trade

Petroleum and other liquids

- Iraq's total seaborne-traded crude oil exports averaged nearly 3.6 million b/d in 2022, which was more than 230,000 b/d above the previous year, based on tanker loadings data.⁷⁶ The rise in exports reflects Iraq's higher crude oil production as the OPEC+ cuts gradually reversed through 2022.
- During 2022, approximately 89% of Iraq's seaborne exports were shipped from the southern terminals in the Persian Gulf, which export Basra medium and heavy crude oil grades (Figure 7).⁷⁷ Before the pipeline closure in March 2023, crude oil from the KRG's fields and Federal Iraq's northern fields was sent by pipeline to Ceyhan, Turkey, where it shipped from the port of Ceyhan.
- Turkey stopped crude oil flows through the Iraq-to-Turkey crude oil pipeline in March 2023 when an international arbitration court ruled in favor of Federal Iraq against Turkey for accepting crude oil from the KRG.⁷⁸ Seaborne oil exports from northern Iraq through the Ceyhan terminal, which averaged 417,000 b/d in the first three months of 2023, dropped to zero after the pipeline closure at the end of March 2023.⁷⁹ As of November 2023, Turkey and Federal Iraq are negotiating an agreement, and the two countries have not resumed crude oil flows through the pipeline.⁸⁰
- Asia (led by India, China, and South Korea) was the main regional destination for Iraq's crude oil, importing 63% of Iraq's crude oil exports in 2022 (Figure 8). China and India each imported nearly 1 million b/d of crude oil from Iraq (more than half of Iraq's total exports), making them the top buyers of Iraq's crude oil during the year. Outside of Asia, Italy, Greece, and Turkey imported the most crude oil from Iraq at around 200,000 b/d each.⁸¹ However, some of these and other European imports at various Mediterranean ports travel further inland to countries

such as Germany, Austria, and Serbia.⁸² Collectively, European countries imported 26% of Iraq's crude oil exports in 2022.

- Russia's full-scale invasion of Ukraine and the partial sanctions on Russia's oil supplies to Europe in 2022 diverted a significant portion of Russia's oil from Europe to Asia and created additional opportunities for Middle Eastern crude oil suppliers to send more volumes to Europe. Iraq significantly reduced the price of its crude oil loadings to Europe in 2022 to be able to compete with other Middle Eastern crude oil grades.⁸³ Although Iraq's crude oil exports to China and India remained high in 2022 and the first half of 2023, China and India replaced some of Iraq's potential crude oil exports with discounted volumes from Russia.⁸⁴
- Infrastructure export capacity at its southern ports in Basra remains constrained and requires investment to rebuild and restore. Iraq's export capacity has declined over the past few years, which limits the country's capacity to produce crude oil. Operational export capacity fell from 3.7 million b/d before 2020 to more than 3.3 million b/d in early 2023. Iraq installed new loading hoses at the Basra Oil Terminal, which bolstered southern capacity to more than 3.4 million b/d by September 2023.⁸⁵ Oil exports in southern Iraq will likely be constrained until 2025, when Iraq can upgrade its infrastructure for the Sealine 3 pipeline.
- Iraq also intends to replace the aging and malfunctioning subsea pipelines critical to oil export infrastructure offshore of Basra. Iraq's cabinet approved Sealine 3, which has a capacity of at least 500,000 b/d and is expected to come online by 2025, barring no more project delays. It will connect to the new, fifth single mooring point to the Basra Oil Terminal and possibly to the Khor Al-Amaya Oil Terminal, which has been out of operations since 2017.⁸⁶ Iraq also approved \$1 billion in 2023 to construct Sealines 4 and 5, which will replace old, inefficient pipelines and further raise southern crude oil export capacity.⁸⁷
- In addition to its seaborne shipments, Iraq also exports relatively small volumes of crude oil by truck to Jordan⁸⁸ and by inland routes to Turkey via an onshore pipeline from the Ceyhan terminal to Turkey's Kirikkale refinery, near Ankara. The Ceyhan-Kirikkale pipeline has a capacity of 145,000 b/d.⁸⁹ Iraq extended its contract by one year with Jordan to sell an average of 10,000 b/d in May 2023.⁹⁰ However, Iraq's exports to the Kirikkale refinery have stopped until the Iraq-Turkey pipeline resumes operations.
- The Federal Iraq government and the KRG signed an agreement in November 2018 that allows Iraq to transport up to 100,000 b/d of Federal Iraq's crude oil from its side of the Kirkuk fields through the KRG's pipeline to Turkey's Ceyhan port for export.⁹¹ Federal Iraq exported more than 80,000 b/d of crude oil from Kirkuk through the KRG pipeline in 2022.⁹² However, this volume has dropped to zero after the pipeline to Turkey stopped operations in March 2023. Federal Iraq has continued output from its Kirkuk fields and sends the oil to local northern refineries.⁹³
- In July 2023, Federal Iraq signed a barter deal with Iran that involves Iraq exporting crude oil and fuel oil to Iran in exchange for natural gas. Although the parties have not revealed the agreement terms, one report suggests that Iraq would send 250,000 b/d to Iran.⁹⁴ Other sources report that Iraq's shipments of crude oil and fuel oil will range from 100,000 b/d to 200,000 b/d.⁹⁵

Natural gas

- Because Iraq's natural gas production and infrastructure growth has not kept pace with its demand, it began importing natural gas from Iran in 2017 to fuel electric power plants near Baghdad and Basra.⁹⁶ Iran has a contract to supply Iraq with up to around 900 Bcf/y in the summer and up to 580 Bcf/y during the winter.⁹⁷ However, Iran's exports are much lower than

contracted volumes. Annual natural gas imports averaged 273 Bcf in 2021, down from 364 Bcf in 2020. Although average annual imports from Iran rose again in 2022 to 333 Bcf,⁹⁸ Iran limited natural gas supplies to Iraq in the summers of 2021 and 2022 because of high domestic demand for natural gas in Iran, a regional drought that caused low hydroelectric power and so higher use of fossil fuels, and the challenge that Iraq faces in making direct payments to Iran.⁹⁹

- In August 2023, Iraq signed a preliminary agreement with Turkmenistan to import natural gas and to diversify its supplies. However, as of December 2023, there are no details of the agreement. If Iraq makes the deal happen, it will need to transport the natural gas through a neighboring country such as Iran or Turkey.¹⁰⁰

Electricity

- Iraq's electricity sector imports a significant amount of its supplies from Iran. In 2022, about 25% of Iraq's electricity was generated by a combination of natural gas produced in Iran and electricity imported from Iran.¹⁰¹ Iran and Iraq signed a five-year agreement in 2022 that lowered the electricity import price for Iraq and set a base volume of 1 GW that Iran must export to Iraq during the summer.¹⁰² Iran reduced its electricity exports to Iraq after 2020 from 7.4 TWh to 3.5 TWh in 2022 because of power shortages and insufficient power generation in Iran.¹⁰³
- Iran also reduced electricity exports to Iraq in the summer of 2023 (and completely stopped flows in late May) because of Iraq's challenges in paying Iran for energy supplies from previous years. The barter deal that Iran and Iraq arranged in July 2023 is intended to resolve these issues, but the countries have not implemented the agreement as of September 2023.¹⁰⁴
- Iraq is looking for ways to diversify its sources of imported electricity and has interconnection projects with the Gulf Cooperation Council (GCC), Saudi Arabia, Turkey, and Jordan (Table 5). Iraq completed a 500 MW power line from Turkey in early 2022, although Iraq has not finalized the contract details.¹⁰⁵ Jordan is set to begin exporting electricity to Iraq through a new transmission line with a capacity of 150 MW in the second half of 2023.¹⁰⁶

Table 5. Iraq's existing and planned electricity import sources

Import source	Capacity (megawatts)	Import status	Notes
Iran	1,500	Existing	Four major transmission lines that connect Iran to Iraq at various points and installed in 2004–2011. ¹⁰⁷
Jordan	150	Late 2023	Future phases of the transmission line would increase capacity to 900 MW. ¹⁰⁸
Turkey	500	Early 2022	A 500-MW power line from Turkey to Iraq was completed in early 2022, although the countries have not finalized contract details including the electricity price. ¹⁰⁹
Gulf Cooperation Council Interconnection Authority (GCCIA)	500	Late 2024	Finalized an agreement in 2022 with the GCCIA. Transmission line will connect Iraq to the line in Kuwait. The parties target a final capacity of 1.8 GW following future phases. ¹¹⁰
Saudi Arabia	1,000	TBD	Saudi Arabia and Iraq signed an agreement in mid-2022 to construct a transmission line from northern Saudi Arabia to the

Baghdad area and began work on the project in mid-2023.¹¹¹

Total **3,650**

Data source: FACTS Global Energy, *Middle East Economic Survey*, Reuters, Jordan News, Iraqi News, Iraq Oil Report, Refinitiv/Zawya, Iran International

Note: TBD=to be determined, MW=megawatt, GW=gigawatt.

Figure 7. Iraq's monthly seaborne crude oil exports, by location, January 2016-June 2023

million barrels per day

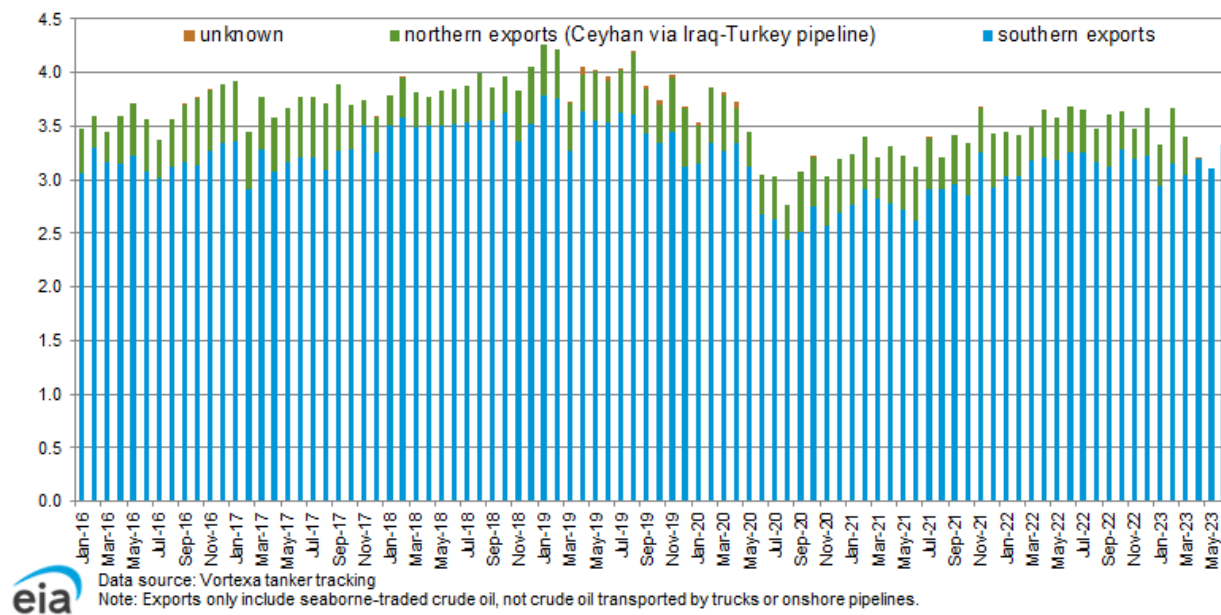
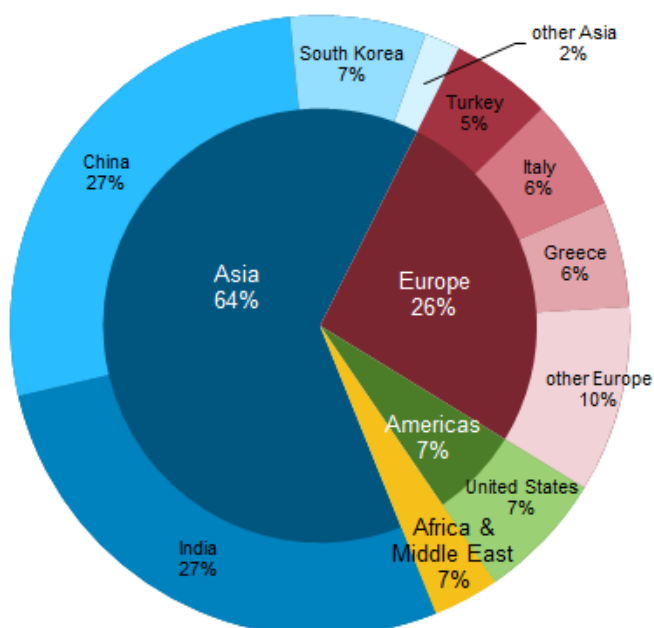


Figure 8. Iraq's seaborne crude oil exports in 2022, by destination



Data source: U.S. Energy Information Administration and Vortexa tanker tracking (accessed August 2023)
 Note: Total crude oil exports were 3.6 million b/d in 2022. Exports only include seaborne-traded crude oil, not crude oil exported by truck or crude oil exported onshore to Turkey via the Ceyhan-Kirikale pipeline to a refinery near Ankara. Totals may not equal the sum of components because of independent rounding.

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