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## **Refineries in the Arab World:**

**Iraq. Qatar. Comoros. Kuwait. Lebanon. Libya.**



**2023**

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### Introduction

*The term "Arab World" is often used to refer to countries in the Middle East and North Africa (MENA) region as well as member states of the League of Arab States. With a population of 373 million (5% of the world's population), a combined GDP of \$870 billion (3% of the world GDP), and a per capita income of about \$2,900, the Arab countries are classified as low-middle income countries, as defined by the World Bank. Despite the historical and cultural ties that exist among Arab countries, there are significant differences between Arab sub-regions (the Gulf and the Arabian Peninsula, the Mashreq and the Maghreb) in terms of population size, resource endowment, levels of economic and social development, production patterns, and per capita income, among others. These differences not only affect the growth patterns of Arab economies but also the process of economic integration, political unity, and cohesion in the Arab world.*

*The Arab world has witnessed major social, economic, and political transformations over the past three decades. The oil sector and the political economy of oil have played, and continue to play, a key role in these transformations at different historical stages.*

*Over the past three decades, the Arab world has accounted for a higher share of the world's oil reserves, production, and exports than any other group of countries, which explains the relative dominance of the oil sector in the Arab oil economies. producing countries and, therefore, the entire region.*

*Of the 19 member states of the Arab League, 14 are oil and gas producers. The six countries of the Gulf Cooperation Council (GCC), together with Iraq, Algeria, and Libya, account for 98% of total Arab oil reserves, 95% of gas reserves, and 90% of total Arab oil and gas production.*

## Iraq

*As of 2016, Iraq's proven oil reserves are 143, 069 billion barrels, which ranks 5th in the world and represents about 8.7% of the world's total oil reserves. Iraq's proven reserves are 457.4 times its annual consumption.*

*Iraq's daily production is 4.26 million barrels, most of which are exported to China, India, and South Korea. Iraq exports 80% of its oil production (3,576,636 barrels per day in 2016).*

*About 1.1 million barrels per day are exported to Europe and purchased by Spain, Greece, and Italy, among others. After the Russian-Ukrainian crisis, Iraq received requests to buy oil from Europe, Asia, and the United States.*

*Iraq consumes 857,000 barrels per day of oil as of 2016 and is the world's 26th largest oil consumer, accounting for about 0.9% of total global consumption.*

*Oil provides 89% of Iraq's budget, and rising prices have allowed the government to repay foreign debt and restart projects stalled in recent years by the financial crisis that hit the country in 2020 as a result of falling oil prices.*

*The Russian-Ukrainian crisis could cause Iraq to lose the Indian and Chinese markets, which buy Russian oil at \$30 cheaper than Brent crude, especially since Iraq exports most of its oil to China and India.*

*Iraq's export capacity is now at its highest level, and increasing it by 300,000 barrels a day would require a very large investment that would take more than six months.*

*Iraq imports 16 million liters of gasoline a day, and the government spends about \$4 million a day to subsidize gasoline prices, and rising oil prices add to that amount because of the domestic gasoline crisis.*

*Iraq spends more than \$3 billion annually to import petroleum products, including 1.07 million tons of gasoil worth \$657 million, 3.46 million tons of gasoline worth \$2.5 billion, and 163,000 tons of white oil worth \$102 million.*

*Iraq consumes 32 million liters of gasoline and 25 million liters of diesel fuel, and a deficit of more than 21 million liters per day is covered by imports.*

*Many refineries in Iraq are outdated and are not operating at full capacity.*

*Iraq's refining sector suffers from serious problems due to its dilapidated state and lack of major investment. This has resulted in the country, which is the second largest OPEC+ oil producer, importing most of its fuel needs.*

*Currently, fuel oil makes up half of the volume produced by Iraqi refineries.*

*There are currently more than 19 refineries in Iraq, including refineries in Kurdistan, and the refining capacity is more than 1 million barrels per day.*

*All refineries are operated by three national refineries founded in 1997, called the North Refineries Company (NRC), Midland Refineries Company (MRC), and South Refineries Company (SRC).*

**Oil refineries in Iraq / Design capacity of refineries (BPSD)****North Refineries Company (NRC):**

- Baiji Refinery- Baiji North 170,000-- Baiji Salahuddin (1 & 2) 140,000



- Kirkuk 30,000
- Hadithah 16,000
- Al Siyria 30,000
- Kisik 20,000
- Quarayah 34,000
- Al Jazeera 20,000

**Midland Refineries Company (MRC):**

- Kerbala 140,000

- Dourah 210,000
- Samawa 30,000
- Najaf 30,000
- Dewania 20,000

**South Refineries Company (SRC):**

- Basrah 180,000
- Nassiriya 30,000
- Maysan 30,000

**Контакты:** <https://www.src.gov.iq/>

**Kurdistan**

- Erbil refinery 110,000
- Basian Refinery 40,000
- Lanaz Refinery 100,000
- Tawki 6,000

**Total:** 1386,000

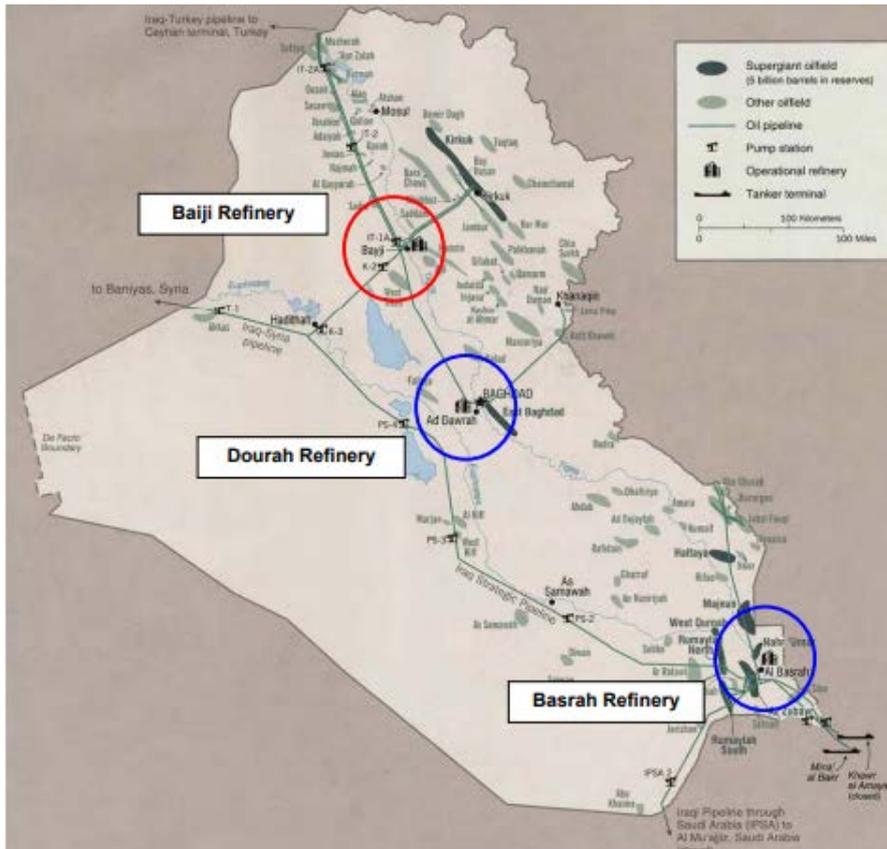


Figure Refineries in Iraq

### Baiji oil refinery

The Baiji refinery is the largest in Iraq and produces one-third of the country's oil production. The refinery is located 130 miles north of Baghdad, about halfway between Baghdad and Mosul, near the city of Baiji province Salahuddin. It consists of the Baiji North and Baiji Salahuddin 1 and 2 refineries.

The total design capacity is 310,000 barrels per day.

**Operator:** North Refineries Company

Founded in 1978, the NRC refinery experienced severe turmoil during the Gulf War, as well as incidents and attacks in subsequent years.

The Ministry of Petroleum has now restarted the refinery to operate at half of its capacity.

The Baiji refineries have the following processing units with their design capacity:

#### Baiji North 150,000

Crude Distillation Unit 150,000 Naphtha HDS Unit 41,000 Platforming Unit 22,000 Kerosene HDS Unit 28,000 LGO HDS unit 31,000 Vacuum Distillation Unit 65,000 Hydrocracking Unit 38,000



#### **Baiji Salahuddin 1**

Crude Distillation Unit 70,000  
 Light Distillate HDS Unit 29,000  
 Gas Oil HDS Unit 12,000  
 Catalytic Reforming Unit 8,000  
 LPG Recovery Unit 540 Tons/D

#### **Baiji Salahuddin 2**

Crude Distillation Unit 70,000  
 Light Distillate HDS Unit 29,000  
 Gas Oil HDS Unit 12,000  
 CatalyticReformingUnit 16,500

There are also auxiliary facilities including crude oil and product storage tanks, product loading systems, and engineering systems such as steam generation, cooling water systems, air supply systems, power reception, and distribution systems.

Crude oil, the raw material for the Baiji Refinery, is supplied from the Kirkuk oil fields through the existing pipeline network in the region.

#### **Petroleum products and their production capacity**

Gasoline 60 700  
 Kerosene 49 000  
 Gasoil (diesel) 58,600  
 Fuel oil 124 100  
 LPG 540 tons/day

Products are delivered to domestic markets by road and rail.

## **Development Prospects**

The Ministry of Petroleum is initiating a project to upgrade the Baiji refinery by installing the FCC complex to increase gasoline and diesel production.

The FCC complex aims to produce high-quality products such as FCC gasoline with a viscosity of about 28,300 bpd with a research octane number (RON) of 90-91 and a sulfur content of less than 10 ppm, diesel fuel with a sulfur content of less than 50 ppm, fuel oil blend, LPG and other by-products (sulfur, heavy fuel blend, coke, etc.)

## **Contacts**

North Refineries Company  
+964 1 5430298

## **Kirkuk Oil Refinery**

The refining capacity of 30,000 barrels per day.

**Operator:** Northern Refineries Company

## **Contacts**

North Refineries Company  
+964 1 5430298

## **Hadithah Refinery**

The refining capacity of 16,000 barrels per day.

**Operator:** Northern Refineries Company

Construction of new refining units to increase refinery capacity to 36,000 bpd begins in late 2020.

## **Contacts**

North Refineries Company  
+964 1 5430298

## **Senyan Refinery**

The refining capacity of 30,000 barrels per day.

**Operator:** North Refineries Company

## **Contacts**

North Refineries Company  
+964 1 5430298

## **Kisik Refinery**

Processing capacity of 20,000 barrels per day.

## **Contacts**

North Refineries Company  
+964 1 5430298

### **Quarayah Refinery**

The refining capacity of 34,000 barrels per day.

**Operator:** North Refineries Company

#### **Contacts**

North Refineries Company

+964 1 5430298

### **Al Jazeera Refinery**

Refining capacity 20,000 barrels per day.

**Operator:** North Refineries Company

#### **Contacts**

North Refineries Company

+964 1 5430298

### **Al Dora Refinery**

The 2,500,000-square-meter Daura refinery in Baghdad City Hall is operated by Midland Refineries Co. and produces a wide range of refined products.

Oil is brought to it from the Kirkuk and Khanaqin fields.

Production capacity 210,000 barrels per day.

#### **Products**

Liquefied petroleum gas (LPG), lubricants, lube oils, naphtha, kerosene, jet fuel, diesel fuel, crude oil reductase, gasoil, hydrogenated white oil, asphalt, and waxes.

#### **Technological distillation units**

crude oil (mbd): 140

Vacuum distillation (mbd): 23

Reformer (mbd): 25

Hydrotreating unit (mbd): 31

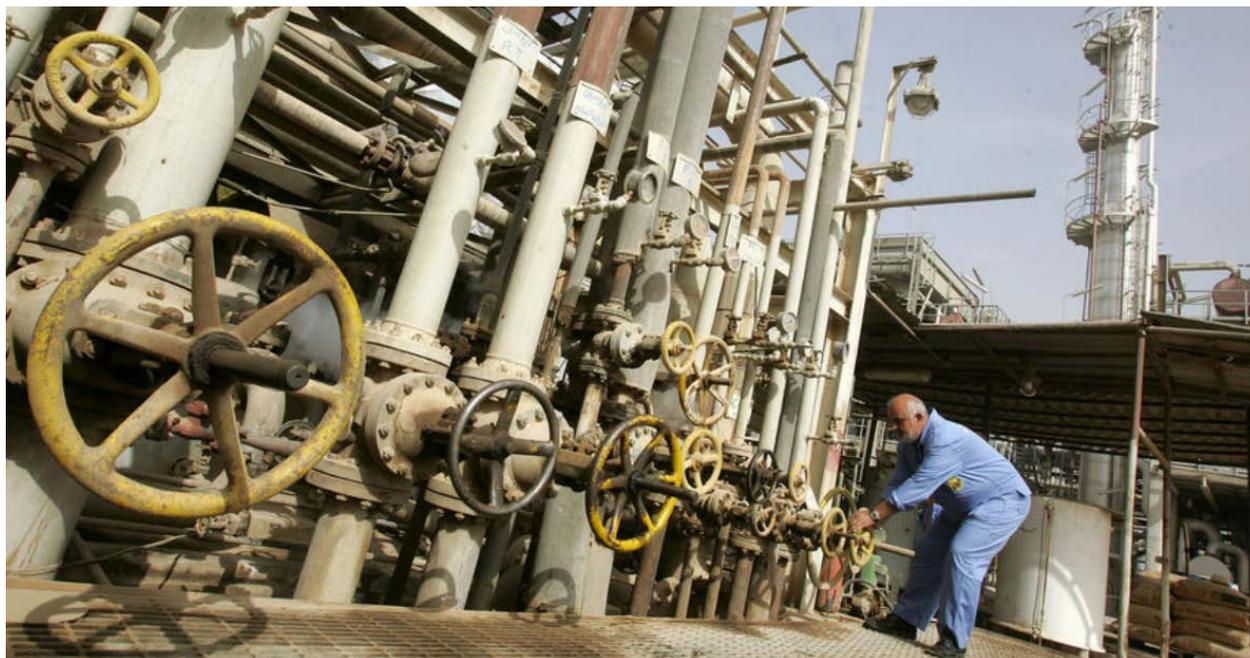
Isomerization (mbd): 10

**Operator:** Midland Refineries

#### **Contacts:**

Daurafax@mrc.oil.gov.iq

<https://mrc.oil.gov.iq/>



### **Samawa Refinery**

The refinery is located in Muthanna province in Samawah, 230 miles (370 kilometers) southeast of Baghdad. Its refinery was built in 1977. The refinery suffered 90 percent damage during the 1991 Gulf War.

It has a production capacity of 30,000 barrels per day.

The Samawa mini-refinery is a reconstruction of an old 10,000 bpd unit that was destroyed during the 1991 Gulf War. It was expanded to 30,000 barrels per day, and an asphalt unit was added in 2009.

The refinery specializes in refining heavy, high-sulfur crude oil from the nearby Kifla fields.

### **Development prospects**

The Department of Petroleum and Midland Refineries approved a refinery upgrade and expansion plan in the second decade of 2022, including a proposed second refinery that would double the current capacity and have a processing capacity of 60,000 barrels per day.

**Operator:** Midland Refineries

**Contacts:** [Info@mrc.oil.gov.iq](mailto:Info@mrc.oil.gov.iq) ,

<https://mrc.oil.gov.iq/>

### Najaf Refinery



The refinery, which began operations in 2006, is located in An-Najaf.

#### **Production capacity**

The crude refining capacity of 30,000 barrels per day.

**Operator:** MidlandRefineries

#### **Contacts:**

Info@mrc.oil.gov.iq

<https://mrc.oil.gov.iq/>

### Dewania Refinery

Crude oil distillation capacity of 20,000 barrels per day.

**Operator:** MidlandRefineries

#### **Contacts:**

Info@mrc.oil.gov.iq

<https://mrc.oil.gov.iq/>

## Raffinerie de Kerbala



Construction of the \$6.5 billion refinery on 6 million square meters (1.5 million acres) with a refining capacity of 140,000 barrels per day started in 2014 and will be completed in 2022.

The refinery is on a pipeline from Basra to the Turkish port of Ceyhan.

### Products

Gasoline, LPG, diesel, fuel oil, gasoil, bitumen, jet fuel, sulfur, and asphalt.

### Processing units

Atmospheric distillation unit with 140,000 bpd, vacuum distillation unit with 72,000 bpd, and naphtha hydrodesulfurization unit (HDS) with 41,500 bpd

bpd, a reforming unit with 25,500 bpd, a C5/C6 isomerization unit with 12,500 bpd, an HDS unit for kerosene with 20,000 bpd, and a gasoil hydrotreatment unit with 28,000 bpd.

The refinery is equipped with a vacuum gasoil hydrotreatment unit with a capacity of 36,000 bpd, a catalytic cracking unit with a capacity of 31,500 bpd, a poly naphtha unit with a capacity of 11,500 bpd, a sulfur extraction unit, and a blowdown asphalt unit.

**Operator:** MidlandRefineries

**Contacts:** <https://mrc.oil.gov.iq/>

<https://www.msk-iraq.com/karbala>

## Basra Refinery



It includes:

**Basra Refinery Section/1** which includes 70,000 refining units, 29,000 hydrogenation units, and 8,000 improvement units.

**Basra Refinery Section/2** includes 70,000 refining units, 29,000 hydrogenation units, and 8,000 improvement units.

**Basra Refinery Section/3** includes 70,000 refining units, 6,000 hydrogenation units, and 10,000 improvement units.

### **Oil refining shop:**

It was founded in 1977, the project was completed in 1982, and production began in 1996. It produces different types of oils, supplying the country's needs for oils and their components. The production capacity is 100,000 tons/year and consists of:

Vacuum distillation unit, asphalt removal unit, furfural processing unit, wax removal unit, fat hydrogenation unit, mixing unit, packing unit, and production of 110,000 tons/year of low permeability asphalt, and there is another hydrogenation and wax casting unit.

**Gas division**, which includes:

- 1- First gas unit (under construction)
- 2- Second gas unit with a capacity of 200 tpd.
- 3- Third gas unit, capacity 220 tpd.

4- Tank unit with a capacity of (1,030) m3

**The Processing and Receiving Division** includes:

1- Crude oil tanks

2- Tanks for intermediate products

3- Tanks for heavy products

Table showing the daily production for all products according to the design capacity

No	Product	Design capacity (m3)/day
1	Refined crude oil	33387
2	Gasoline produced at reformers	3113
3	Gasoline *Petrol	7800
4	White oil + jet fuel	1276953
5	Gasoil	3870
6	Motor fuel	17090
7	Liquefied gas (tons) LPG	640
8	Asphalt (tons)	456
9	Light naphtha	1709
10	Heavy naphtha	5005
11	Base oils	340

**Operator:** South Refineries Company (SRC)

**Contacts:** <https://www.src.gov.iq/>

### **Nassiriya Refinery**

The Nasiriya refinery, located in the southern province of Dhi Qar, about 400 km south of Baghdad, began construction in 1980.

#### **Production capacity**

The refinery consists of three processing units with a capacity of 10,000 bpd and a total capacity of 30,000 bpd; asphalt plant with a capacity of 500) tons per day.

**Operator:** South Refineries Company (SRC)

**Contacts:** <https://www.src.gov.iq/>

### **Maysan Refinery**

The Maysan Refinery was founded in 1999 to provide petroleum products to Maysan and surrounding areas, and to increase the company's production capacity. With a production capacity of 10,000,000 bpd, it was expanded in 2010 with two processing units, each with a capacity of 10,000,000 bpd to 30,000 bpd.

**Operator:** South Refineries Company (SRC)

**Contacts:**

<https://www.src.gov.iq/>

### **Kurdistan Refinery**

There are four official refineries in Kurdistan. The total production capacity of these refineries is about 256 thousand barrels of crude oil:

**KAR Oil Refining** in Erbil province is owned by the private Kurdish company Kar Oil & Gas.



Crude oil is transported from the Khurmalah field through a 40-kilometer pipeline to the central refinery in Erbil.

The refinery's production capacity is estimated at 110,000 barrels per day.

The refinery produces diesel fuel, benzene, and kerosene.

**Basian Refinery** in Sulaymaniyah Province, the refinery has a production capacity of about 40 thousand barrels per day.

**The Lanaz Refinery** is considered one of the largest refineries in the Kurdistan Region, located in the western part of Erbil Province, north of the Republic of Iraq, on the road between the cities of Erbil and Al Kuwait, and was opened on October 26, 2022.

The production capacity of the refinery is estimated at approximately 100,000 barrels per day.

**In the Tawki refinery** in Dohuk province, the refinery's production capacity is estimated at 6,000 barrels of crude oil per day.

Refineries in Kurdistan can produce about 8.6 million liters of gasoline per day if the state regularly supplies them with crude oil. In the past three months, refineries in Kurdistan have produced about 835,000 liters of gasoline, an amount that covers about 17 percent of Kurdistan's needs.

### **Prospects for oil refining in Iraq**

Iraq is experiencing a gasoline crisis due to the lack of sufficient refineries in the country.

On January 12, 2023, the Iraqi Oil Minister announced upcoming investments in the refining industry and said that plans include increasing refining capacity as follows:

Al Amara Refinery (150,000 bpd);

Al-Mutanna Refinery (100,000 bpd);

Kirkuk refinery (100,000 bpd);

Qayyar refinery (70,000 bpd); and,

a new unit with a capacity (of 70,000 bpd) at the Di-Kar refinery.

The Ministry also plans to build a new refinery in Dhi Qar province with a capacity of 150,000 bpd and continues to add production capacity to refineries in the south, center, and north.

Earlier it was announced the addition of a new production unit at the Divaniyah refinery (70,000 bpd) and the imminent start of production at the Kerbela refinery (140,000 bpd).

Iraq could invest up to \$10 billion in the oil sector and increase production to 8 million bpd at current oil prices.

## Qatar

*Qatar's economic prosperity is due to the production and export of oil, discovered in 1939 and first produced in 1949, and natural gas. Qatar has enormous natural gas reserves and its North Field is one of the largest gas fields in the world. Oil reserves are modest by regional standards, according to a global ranking Qatar has 25, 244 billion barrels of proven oil reserves as of 2016, ranking 13th in the world and accounting for about 1.53% of total world reserves.*

*Qatar's proven reserves are 402.1 times its annual consumption. This means that without net oil exports, there would be about 402 years left (at current consumption levels and excluding unproven reserves).*

*Qatar produces 1,987,192.98 barrels of oil per day (as of 2016), ranking 14th in the world.*

*Qatar produces an annual amount equivalent to 2.9% of its total proven reserves (as of 2016).*

*Oil consumption is 172,000 barrels per day state (as of 2016 and ranked 59th in the world, accounting for about 0.2% of total world consumption.*

*Qatar exports 25% of its oil production (503,415 bpd in 2016).*

*Oil and gas operations are overseen by the state-owned QatarEnergy, and private corporations continue to play an important role as service companies.*

*LNG, crude oil, and refined oil account for the bulk of the export value. Qatar's main sources of imports include the United States, China, Germany, Japan, and the United Arab Emirates. South Korea, Japan, China, and India are among Qatar's most important export destinations. Japan and South Korea receive the largest share of Qatar's exports, mostly in the form of oil and petroleum products.*

*Qatar has two refineries and a network of export terminals. An extensive network of offshore pipelines transports crude oil from the offshore oil fields to the island of Halul, where the oil is refined for export. On land, most oil is shipped to Umm Said for refining or export.*

*Qatar has three main export terminals: Umm Said, Haloul Island, and Ras Laffan.*

*Qatar typically exports about 600,000 bpd of crude oil and about 20,000 bpd of refined products. Most exports go to Asia, with Japan being the largest recipient (about 380,000 bpd of crude in 2006). International customers include Emirates National Oil Co. (ENOC), Glencore, Bakri Trading, Vitol, Mitsui, and ITOCHU.*

*Two refineries - QP Refinery in Umm Said and Laffan Refinery in Ras Laffan - perform refining operations. In addition, Qatar Petroleum has two joint ventures with South African Sasol (Oryx GTL) and Anglo-Dutch Shell (Pearl GTL), which produce synthetic oil products (GTL-Naphtha, GTL-Diesel) from natural gas with Liquid Technology.*



### Oil Refinery "QatarEnergy"

The QatarEnergy refinery complex, owned by Qatar National Petroleum Company, located in the industrial city of Mesaid, about 40 km south of Doha, was first established in 1954 and has since been modified through several expansion phases to meet the growing domestic needs in Qatar with the capacity to process over 100,000 barrels per day.

**Industrial capacity:** 137,000 barrels per day



In 2020, QatarEnergy completed the integration of its subsidiary SEEF Ltd.'s Linear Alkylbenzene (LAB) chemical plant and petrochemical operations into the QP refinery in Mesaida (MIC).

Along with 100,000 tons of LAB per year, the SEEF MIC complex also produces 80,000 tons of normal paraffin per year, 36,000 tons of benzene per year, and 3,500 tons of heavy alkyl benzene (heavy alkylate) per year as a by-product.

At the end of 2020, QatarEnergy completed its ultra-low sulfur diesel (ULSD) upgrade project designed to improve gasoline production to Euro-5 quality compared to Euro-3 standards, including the installation of a new liquid fuel oil fraction catalytic cracker (RFCC) and light gasoline hydrotreater.

The MIC refinery began supplying ULSD to Qatar's domestic transportation market, and all diesel fuel now sold in the country meets the Euro 5 emission quality standard with a maximum sulfur content of 10 parts per million.

The launch of ULSD production at the MIC refinery followed the completion of QP's diesel hydrotreater upgrade project.

The refinery's core business is refining crude oil and condensate from the Dukhan field and condensate from the North Field into various finished products to meet domestic demand and for exports.

**Contacts:**

<https://www.qatarenergy.qa/en/Pages/Home.aspx>



### Laffan Refinery 1

Laffan Refinery 1, is Qatar's first condensate refinery.

#### Refinery capacity

146,000 barrels per day

The refinery began operations with a capacity of 146,000 barrels per day (BPSD) and is currently using field condensate from the Qatargas and RasGas facilities.

The refinery has a production capacity of 61,000 bpd of naphtha, 52,000 bpd of kerosene, 24,000 bpd of gasoil, and 9,000 bpd of liquefied petroleum gas.

**Operator:** Qatargas Operating

#### Refined products

Hydrotreated naphtha

Hydrotreated Kerodget

Gasoil

LNG

The refinery is owned by QatarEnergy, TotalEnergies, Cosmo Oil, Exxon Mobil, Idemitsu Kosan, Marubeni и Mitsui.

Qatargas Operating Co Ltd (Qatargas), a subsidiary of QatarEnergy, is a producer and supplier of liquefied natural gas (LNG). The company refines crude oil and produces LNG at its gasification terminals. It also produces LNG, liquefied petroleum gas (LPG), plant condensate, jet naphtha, helium, gasoil, and sulfur. It operates LNG production lines, gas production units for domestic sales, condensate processing plants, helium production units, and boil-off recovery units at the jetty. The company exports its products to markets in Europe, Asia, the Middle East, and North and South America. The company has offices in China, Qatar, Japan, South Korea, and Thailand. Qatargas is headquartered in Doha, Qatar.

#### Process units:

Condensate Separator (mbd): 160

Hydrotreatment unit (mbd): 186

Laffan Refinery 1 continues to expand its condensate processing capacity, delivering more products from the second refinery, known as Laffan Refinery 2 (LR-2) Laffan Refinery 2 (LR-2)

#### Production capacity

292,000 barrels per day



The Laffan Refinery 2 (LR2) began commercial production in 2016, the culmination of a strategic expansion of Qatargas' world-class facilities in the industrial city of Ras Laffan. LR2 adds 146,000 bpd refining capacity to the existing LR1, effectively doubling the total refining capacity to 292,000 bpd.

Laffan Refinery 2 produces low-sulfur Euro-5 products such as naphtha, kerobjet (A-1), ultra-low-sulfur diesel, propane, and butane for local and international markets.

Since 2014 most of the gasoil produced is converted to diesel (less than 10 ppm S).

**Process units:**

Condensate Separator (mbd): 146

Hydrotreatment unit (mbd): 132

LR 2 shareholders are QatarEnergy (84%), Total (10%), Cosmo (2%), Idemitsu (2%), Mitsui (1%), and Marubeni (1%).

The Laffan refinery helps leverage the synergies and opportunities associated with the development of the North Field, Qatargas, RasGas, and other Ras Laffan facilities. It consists of process units including utility systems, distillation units, naphtha and kerosene hydrotreating units, a hydrogen unit, and a saturated gas unit producing naphtha, kerodjet, gasoil, and liquefied petroleum gas (LPG).

**Contacts:**

[qatargas.com](http://qatargas.com)

## Comoros

The small island republic of Comoros has no known oil or gas reserves, either on land or at sea. Its refining industry depends entirely on petroleum products imported from Tanzania and other continental African countries.

The industry is regulated by the Comoros Ministry of Planning. Comoros has no oil industry.

With a population of 585,000 and an economy based primarily on fishing and tourism, the consumption of petroleum products is small. Refined petroleum products supply 91.5% of the islands' commercial energy needs.

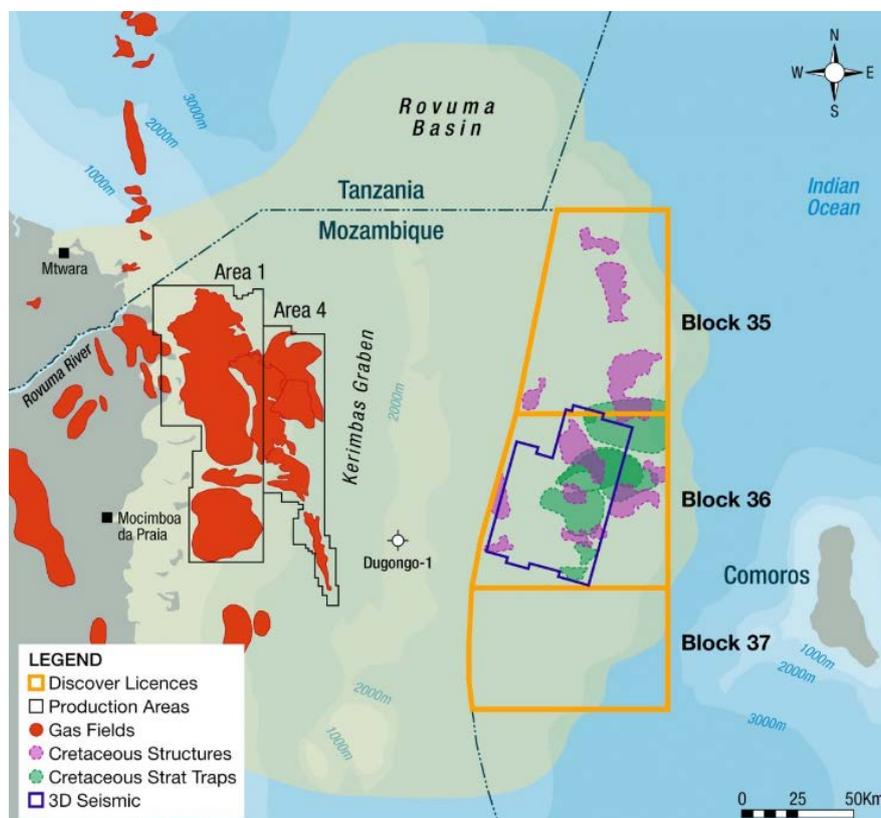
Nearly three-quarters of electricity is generated from diesel fuel; imported petroleum products for 2015 were 36 ktoe.

Total energy consumption generated from diesel in Comoros is 23 ktoe (thousand tons of oil equivalent) according to AFREC, 2015. Comoros consumes 1,300 barrels of oil per day as of 2016. Products consumed in metric tons: gasoline 3.852, jet fuel 0.921, kerosene 3.778, distillate 12.230, unspecified 2.219 (U.S. Department of Energy data).

Comoros ranks 204th in the world in oil consumption, which is about 0.001% of total global consumption per day.

Comoros consumes 0.07 gallons of oil per capita each day (based on 795,592 people in 2016), or 25 gallons per capita per year (1 barrel). [1 barrel = 42 U.S. gallons]. The distribution and marketing of fuel products are done by the state oil company Societe Comorienne des Hydrocarbures (SCH), the only oil company in Comoros. The company has 2 product warehouses.

## Prospects



Discover Exploration, a UK-based independent energy consulting group, acquired a 3,000-square-kilometer 3D seismic survey in 2019, the first in Comoros.

Based on prospecting to date, the prospectivity of blocks 35, 36, and 37 offshore Comoros, located in the eastern Rovuma Basin, outside the Mozambique offshore Rovuma 1 and 4, where some 200 trillion cubic feet of natural gas has been discovered, the largest natural gas discovery in the world in decades, is very significant. In its latest CPR (Competent Persons Report), the group estimates the presence of more than 3 billion barrels of oil in the average prospective resource within a three-dimensional seismic survey.

In contrast to the western part of the Rovuma Basin, the deep-water turbidite export cones located in Blocks 35, 36, and 37 are less deeply buried and have lower thermal activity, indicating an oil fairway through the eastern part of the Rovuma Basin.

The drilling of the first exploration well will occur as early as 2023.

#### **Contacts:**

<https://www.discover-exploration.com/assets/comoros>

## **Kuwait**

*Kuwait's oil industry is the largest in the country, accounting for almost half of the country's GDP. Kuwait's proven crude oil reserves total 101.5 billion barrels, representing 6.1% of the world's reserves. Kuwait's oil reserves are the sixth largest in the world, and the Burgan field is the second largest oil field. Kuwait's proven reserves are 774.6 times its annual consumption.*

*Kuwait consumes 359,000 barrels per day (b/d) of oil as of 2016 and is the world's 39th largest oil consumer, accounting for about 0.4% of total global consumption.*

*Kuwait is the eleventh largest oil producer in the world and the seventh largest exporter. Kuwait exports 71% of its oil production or 2,128 barrels per day.*

*Kuwait's oil production is 7% of the world's oil production and amounts to 2,990,544 million barrels per day.*

*Since the government of Kuwait owns the oil industry, it controls a large portion of the country's economy; in general, about 43 percent of GDP. Kuwait's oil exports vary according to domestic demand-almost all of Kuwait's energy comes from oil and to international demand, prices, and production quotas set by OPEC, of which Kuwait is a member. But OPEC quotas are difficult to enforce, and Kuwait and other countries have been accused of violating them.*

*Kuwait National Petroleum Company (KNPC): Operates refineries in Kuwait.*



The Kuwait National Oil Company is one of the world's largest oil refiners. The company currently has two refineries, Mina Abdullah and Mina Al-Ahmadi, with a total production capacity of 690,000 barrels per day. It also has gas liquefaction plants with a capacity of 2.5 billion standard cubic feet per day.

### Mina Al Ahmadi Refinery



#### Production capacity

466, 000 bpd

The Mina Al Ahmadi Refinery (MAA) was built in 1949 as a simple 25,000 bpd refinery to meet local demand for gasoline, diesel, and kerosene. It occupies 10.5 km<sup>2</sup> of land and is located 42 km south of Kuwait, west of Ahmadi, right on the Gulf Coast.

Over the years, MAA has undergone a two-phase upgrade, and 29 new units have been built using advanced technology to increase its capacity to 466,000 bpd. The new products have lower sulfur content.

**Gas processing capacity** of 2,485 million cubic feet per day

**The refinery has the following export facilities:** North Pier, New Oil Pier, and South Pier (now LNG jetty). Sixteen loading arms were added to the South Pier, and Piers 3 and 4 were modernized so that four oil tankers with a capacity of 9,000 tons per hour could moor simultaneously.

#### Main Process Units:

1. MAFP Units (Units produce lead-free gasoline, MTBE, alkenes, and propylene)
2. FCC Unit (Liquid catalyst cracker was built in 1987 with a capacity of 40,000 bpd. The capacity will increase to 42,500 bpd with the CFP. This unit refines heavy gas oil into gasoline. Other products include LPG).
3. Eocene Distillation Unit (This unit processes 24,000 bpd of heavy Eocene oil, mainly to produce bitumen for the local market.)
4. Sulfur Recovery Units (The units process 1,334 tons of sulfur per day, a refinery byproduct. These units extract sulfur from sour gas recovery units).
5. Naphtha Reformers (Contains a naphtha complex with two lines for processing and separating naphtha into light and heavy products. The total capacity of the two units is 36,000 barrels per day).

6. Gas Liquefaction Units (MAA have 4 gas lines to process gas produced from either KOC oil fields or KNPC refineries. The units extract propane, butane, and gasoline at a volume of 2,485 million standard cubic feet per day. The gas is used in power plants, local industries, and for domestic consumption. These plants also produce condensates)

7. Storage tanks.

### Products

Gasoline, kerosene, gasoil (diesel fuel), bitumen, naphtha, liquefied petroleum gas, and sulfur

### Contacts:

<https://www.knpc.com/en/>

### Mina Abdullah Refinery



### Production capacity

270, 000 barrels per day

The Mina Abdullah Refinery (MAB) was built in 1958 by the American Independent Oil Company (AMINOIL) before it was fully purchased by the State of Kuwait in 1977. It was renamed the Kuwait Wafra Oil Company as a national company before being transferred to KNPC. in 1978. At that time it had only one refining unit with a capacity of 30,000 barrels per day. MAB implemented expansion projects that increased capacity by 145,000 bpd, and then a modernization project in 1988 (MAB RMP) increased refining capacity to 240,000 bpd. The 15 new units used the most advanced technologies of the time to produce light petroleum products with low sulfur content and valuable products.

The refinery occupies 7,835 km<sup>2</sup> of land and is located 53 km south of Kuwait, right on the Gulf Coast.

### Basic Blocks:

1. Crude Distillation Units (CDU) (The units produce crude oil and then separate it into gas, naphtha, kerosene, diesel, and high-sulfur diesel fuel).
2. Coker Unit (At a capacity of 40,000 barrels per day, the unit turns residue from the bottom of barrels into more valuable products).

3. ARDS Unit (Processes 85,000 barrels per day of high-sulfur atmospheric residue. It reduces sulfur content to 0.7%, demetallizes, and removes nitrogen compounds from the crude block. This process helps to refresh the bottom of the barrel).

4. Hydrocracker Unit (The unit processes gasoil into liquefied petroleum gas, naphtha, and kerosene that meet stringent quality requirements. Capacity 42 500 barrels per day).

**The MAB uses Sea Island as its export facility;** it is located 5 km offshore. It has two piers, one for loading giant oil tankers of up to 276,000 tons and the other for 140,000 tons. Each pier has four arms for loading light products.

#### **Products**

MAB produces all types of oil byproducts naphtha, kerosene, low-sulfur gasoil, coke, fuel oil, and sulfur

#### **Contacts:**

<https://www.knpc.com/en/>

#### **Shuayba Refinery:**

The Shuaiba Refinery, built in 1966, was the first refinery in the region to be built by a national company. The refinery covered an area of 1,332,000 m<sup>2</sup> and was located 50 km south of Kuwait in the Shuaiba Industrial Zone. The refinery had a capacity of 200,000 barrels per day (32,000 m<sup>3</sup> / day). In March 2017, the refinery was closed so that its capacity could be repurposed for the National Clean Fuels Project (CFP).

#### **Development Prospects:**

##### **Al-Zur Refinery**

KNPC announced plans to build an environmentally friendly fourth refinery, known as Al-Zour, in 2006. The plans were revised in 2012 due to re-approval by the Kuwaiti Supreme Petroleum Council. The refinery is expected to have a capacity of 615,000 barrels per day (97,800 m<sup>3</sup> / day), making it the largest refinery in the Middle East.

In May 2017, KPC established Kuwait Integrated Petroleum Industries Company (KIPIC) to develop and operate the refinery, as well as a liquefied natural gas (LNG) terminal and petrochemical facility within the Al-Zour integrated complex. This is an integral part of Kuwait Vision 2035.

The Al Zour refinery is a cooperation project between Kuwait and China under the One Belt, One Road initiative.

The Al Zour integrated complex, estimated to cost \$27 billion, will include an 11 million tons per year LNG import terminal and a petrochemical complex capable of producing 2.7 million tons of aromatic hydrocarbons and polypropylene per year, as well as 1.7 million tons of gasoline per year.

All three components of the Al-Zur integrated complex are expected to reach full production capacity by 2024.

## Lebanon

In 2010, a U.S. Geological Survey report estimated gas reserves in the eastern Mediterranean basin at 122 trillion cubic feet, in addition to one billion 700 million barrels of oil. The latest estimates to date suggest about 95 trillion cubic feet of gas and about 900 million barrels of oil, a cubic meter is equivalent to 36.31 cubic feet, and if the amount of gas is calculated in cubic meters, it is about 2,616 billion cubic meters,

After numerous studies, experts have concluded that there is oil in three Lebanese regions: the Batrun Chekka, which extends to Mount Terbol, in the Rashkid area of Batrun, the Sohmour and Yohmore areas in the Bekaa and the Adloun area.

In recent years, the border demarcation crisis has hampered Lebanon's plans for oil and gas exploration in its territorial waters, with many international oil companies reluctant to bid to avoid political crises and disputes.

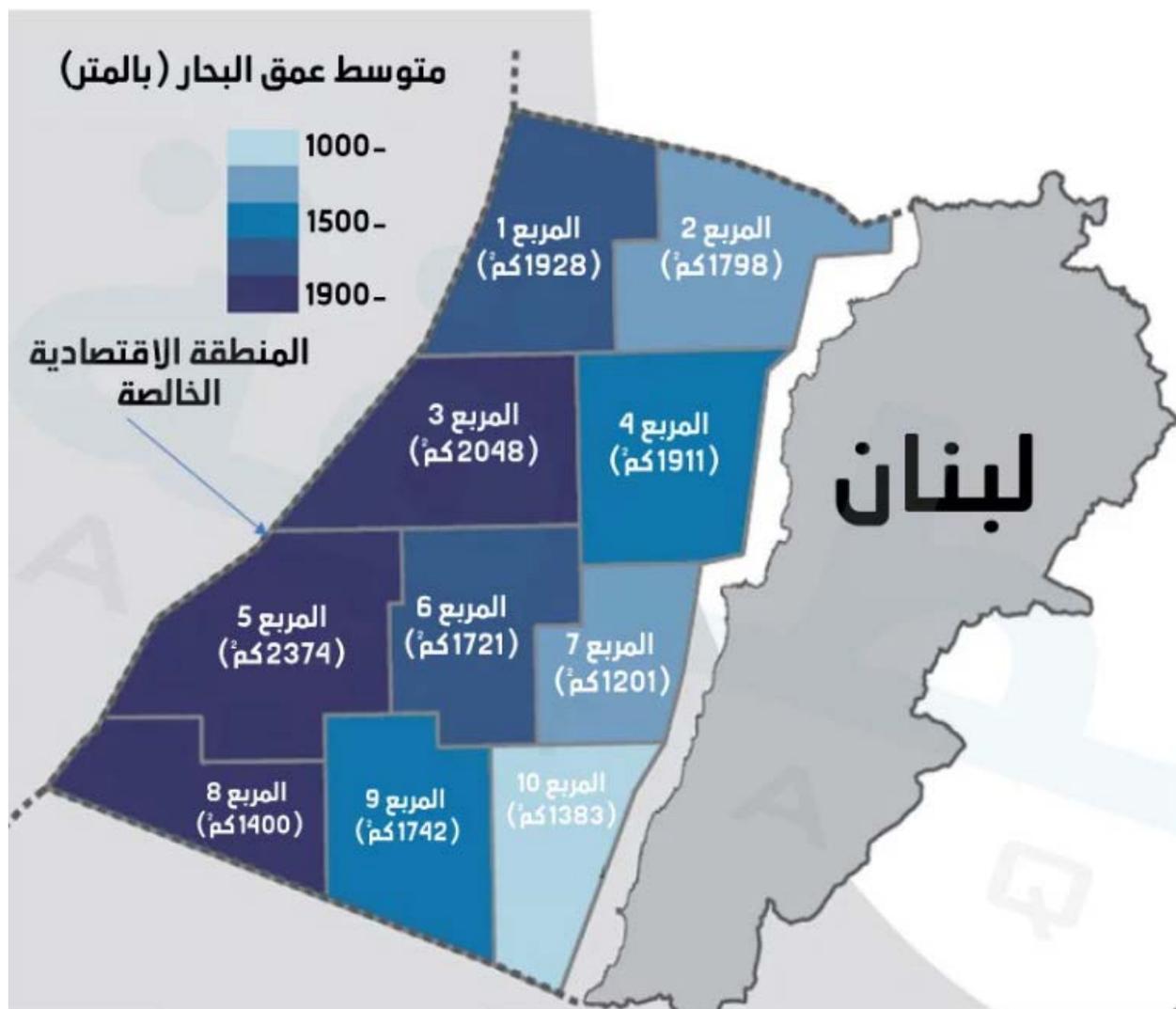
Israel and Lebanon have been in indirect negotiations for three years. They were launched in 2020 under the auspices of the U.S. and the United Nations to solve the demarcation of maritime borders.

The dispute between the two countries revolves around gas exploration rights in the Karish field and Line 29, as Lebanon seeks to share oil resources with Israel in territorial waters, and the disputed area is 860 square kilometers.



Over the past two decades, two- and three-dimensional seismic data have been collected in the exclusive economic zone, which covers an area of 22,730 square kilometers. According to preliminary data, there are 25 trillion cubic feet of gas in the southwest corner.

Lebanon's Exclusive Economic Zone includes 10 offshore zones ranging from 1,201 to 2,374 square kilometers per square, and exploration work in two of them (Sector 4 and Sector 9) has been entrusted to a consortium of 3 companies, being France's Total, Italy's Eni and Russia's Novatec, with the latter recently withdrawing to transfer its share to the Lebanese government. Initial drilling at Concession 4 showed traces of gas, but it has no commercial reserves, and exploration at Concession 9, part of which is in a disputed area with Israel. "Commercial reserves" are economically viable quantities of oil and gas, so that oil and gas revenues cover expenses, including revenues that the government receives, and generate profits for investors.



Lebanon also began the second phase of offshore oil and gas exploration in November 2021, for which the deadline for bids from oil and gas companies was extended until December 15 (2022). Areas open for bidding include 8 of the 10 areas, with auctions taking place for areas 4 and 9 in the first license round.

Lebanon consumes 153,000 barrels per day (b/d) of oil as of 2016 and is the world's 64th largest oil consumer, accounting for about 0.2% of total global consumption at 97,103,871 b/d.



**National Oil Corporation** — the national oil corporation, owned by the Libyan state, part of the Ministry of Oil and Gas, and headquartered in Tripoli, is the only institution that produces, refines, and exports oil in Libya, in addition to several subsidiaries. Together, they manage more than half of the country's oil production. It also controls the price of petroleum products within Libya and oversees the negotiation and issuance of licenses for oil exploration and production in the country.

Previously there were two refineries in the country, in Tripoli and Al-Zahrani.

### Tripoli Refinery (INACTIVE)

The refinery was founded in 1940 to refine crude oil coming from the Karkuk-Iraq fields through pipelines and had a capacity of 21,000 barrels per day. The Iraqi Petroleum Company (IPC) transported crude oil from Karkuk-Iraq through pipelines from Iraq via Syria to a terminal in Tripoli-Lebanon for export and refining. The Lebanese war halted the refinery in 1976. Later crude oil was imported by tankers.

The Tripoli terminal is located three miles northeast of Tripoli. It has a total area of 1 million square meters. It receives crude oil from the Carcuk wells through three pipelines: 12", 16", and 30/32". The maximum total pumping capacity is 900,000 barrels per day (120,000 tons).

### Ongoing activity

The facilities operate based on importing oil and diesel fuel through a terminal and storing them in tanks, refining them, and selling these petroleum products on the local market through distribution companies. The economic studies conducted in this report showed that it is not feasible to rehabilitate the Tripoli refinery because its current capacity is 21,000 bpd and local market demand exceeds 140,000 bpd.

### Zahrani Refinery (INACTIVE)

The facilities of the old refinery consist of two locations: the downstream pipeline and the tanks at the refinery.

The downstream pipeline was built by BECHTEL and belonged to Tapeline, the Trans-Arabian Pipeline Company, which received light Arabian crude oil from Saudi Arabia through pipelines running through Jordan and Syria to the mouth of Zahrani in southern Lebanon. Work on the refinery began in the early 1950s, and it processed 17,500 barrels per day until it was completely shut down in 1989 for the same reasons that led to the shutdown of the Tripoli refinery.

The refinery's storage facilities contain Gasoline tanks: two, with an allowable capacity due to age of 26,300 barrels, or about 4,179 m<sup>3</sup>. Diesel fuel tanks: four, with an allowable capacity of 111,600 barrels, or about 17,700 m<sup>3</sup>. Crude oil tanks: two, with a capacity of 45,000 barrels, or about 7,150 m<sup>3</sup>.



### Current Status

The oil plants operate by importing fuel oil and gas oil via a 500,000-barrel bottom 31-inch pipeline through Jordan and Syria to the mouth of Zahrani in southern Lebanon, a total length of 1,213 km to be stored in facility tanks which are then distributed to the local market via distribution companies.

The total area of the estuary is 2,200,000 square meters. The estuary consists of two sections: the lower section, which includes a section of the offshore section and operations conducted onshore, and the upper section, which includes a section of the reservoir complex.

### **Development prospects**

The Lebanese Ministry of Energy and Water intends to rehabilitate some of the oil facilities in Tripoli, they will be used to store and refine gasoline, gasoil, kerosene, and fuel oil. This oil storage terminal will be located in the former external sites of the oil facilities in Tripoli, which are currently unused.

The Ministry, through the oil facilities in Tripoli and Al-Zahrani, is submitting tenders for the design, procurement, and contract for the construction of the station. The capacity of the station is about 430,000 cubic meters.

The terminal will be located at the end of an oil pipeline that is currently unused and supplied the former Tripoli refinery with crude oil from Kirkuk in northern Iraq. This line could be upgraded, allowing the terminal to be used to export crude oil.

### **Contacts:**

<https://www.dgo.gov.lb/category/1>

## **Libya**

*Libya is a member of the Organization of Petroleum Exporting Countries (OPEC) and has the largest proven oil reserves in Africa with 48,363,000,000 barrels as of 2016 and ranks 9th in the world or 2.9% of total world oil reserves at 1,650,585,140,000 barrels.*

*Libya's proven reserves are 594.2 times the annual consumption. This means that without net oil exports, there would be about 594 years of oil left (at current consumption levels and excluding unproved reserves).*

*About 80% of Libya's proven oil reserves are concentrated in the province of the Sirte Basin, which accounts for 90% of the country's oil production. Libya consumes 223,000 barrels per day of oil as of 2016 and is the world's 53rd largest oil consumer, accounting for about 0.2% of total global consumption at 97,103,871 barrels per day.*

*Libya produces 499,396.79 barrels of oil per day (as of 2016), ranking 30th in the world. This number is equivalent to 0.4% of its total proven reserves (as of 2016). Libya exports 48% of its oil production (238,501 bpd in 2016).*

*As of 2017, Libya has 53 trillion cubic feet (trillion cubic feet) of proven gas reserves, ranking 21st in the world and accounting for about 1% of the world's total natural gas reserves of 6,923 trillion cubic feet.*

*The government dominates Libya's economy by controlling oil resources, which account for about 95% of export revenues, 75% of government revenues, and more than 50% of GDP, amounting to \$50.2 billion in 2006. About 60% of petroleum products are exported, mostly to Europe. Most of the petroleum products produced by the National Oil Corporation are sold temporarily, including to the overseas oil retail and distribution network Oilinvest, also known as Tamoil. Through Tamoil, Libya is a direct producer and distributor of oil products in Italy, Germany, Switzerland, and Egypt.*

## National Oil Corporation

The National Oil Corporation of Libya owns a group of refining and oil and natural gas companies that operate five refineries.



National refineries cover only 20% of the domestic gasoline demand, and with its limited production, Libya has become a major importer of automotive fuel. The main local source of motor gasoline is the Zawiya refinery, which in the past processed Sidra crude oil and today refines Sharara crude oil, which is connected to it by a pipeline network from the field.

**Contacts:** <https://noc.ly/index.php/en>

### Oil refineries in Libya:

- 1- Ras Lanuf Refinery
- 2- Zawiya Refinery
- 3- Tobruk Refinery
- 4- Sarir Refinery
- 5- Brega Refinery

The total refining capacity of these refineries is 380,000 barrels per day, which are processed into petroleum products, the most important of which are gasoline, diesel, heavy fuel, and tar. The volume of refined gasoline, the most important product of the refining process, is estimated to average about 2 million liters per day, which is only 30% of the country's daily gasoline demand.



### **Ras Lanuf Oil Refinery**

The Ras Lanuf Refinery is the largest in Northern Libya, located in the Gulf of Sidra, in the Mediterranean industrial city of Ras Lanuf. It is operated by the Ras Lanuf Oil and Gas Processing Company (RASCO), a subsidiary of the Libyan state-owned Libyan National Oil Corporation, and was opened in 1984.

The city is also home to the Ras Lanuf petrochemical complex, which has a port for the export of oil.

### **Ras Lanuf Oil Port**

The oil port of Ras Lanuf is one of Libya's oil export ports on the Mediterranean Sea, about 375 kilometers west of Benghazi and about 650 kilometers east of Tripoli. The port is about three kilometers from the company's headquarters in Ras Lanuf. It is used to export Libyan oil through pipelines to transport oil from oil fields in the south. It began exporting in 1964.

The oil storage facility in the port of Ras Lanuf is located onshore, about 9 km from the shore, with 3 main oil pipelines and 13 oil storage tanks with a capacity of 6.5 million barrels of oil. It has four berths.

### **Production capacity of the refinery**

220,000 barrels per day.

### **Refined products**

Fuel oil, diesel fuel, LPG, naphtha, kerosene, ethylene, propylene, thermal gasoline, and petrochemicals.

The Ras Lanuf refinery was founded in the remote Oil Crescent area near the port of Ras Lanuf to export crude oil produced mainly by Mobil, which has now been taken over by Harouge (an alliance corporation with Petro-Canada-Sin Cor.) -Winterchill), located midway between the two cities of Bin Jawad and Marsa al-Brega. The refinery was conceived as the heart of a large petrochemical complex for the production of so-called olefins, used in the production of plastics and synthetic rubber.

There is a plant for the production of downstream products, polyethylene (the capacity of the plant to produce ethylene is 1000 tons per day).

The Ras Lanuf refinery is an important source for producers of diesel fuel and fuel oil, which are used in power plants and some factories, especially in the eastern region.

It does not produce automobile gasoline because it uses naphtha, the main source of automobile gasoline, to feed an ethylene plant. The plant has been negatively affected by two events: the U.S. embargo on Libya and stiff competition from the European petrochemical industry. The remaining products are exported to world markets, including petrochemicals, except for ethylene, some of which is used at the complex itself or the Abu Kammash complex.

In 2008, Libya accepted its first foreign participation in the refining industry after selling some ownership of the Ras Lanuf refinery to the Emirati company Al Ghurair, and a joint Libyan-Emirati company was established to manage the refinery only, rather than the rest of the petrochemical complex.

The stated purpose of this deal was for the foreign partner to invest in upgrading the refinery and turn it into a profitable commercial project in which it would share the management and ownership of the National Oil Corporation, with a commitment from the foreign partner to supply the local market and retain and train the national workforce. However, the refinery is currently on hold due to the political circumstances the country is experiencing and a dispute between the national component and the foreign partner over the management of the refinery.



### Zawiya Refinery

The Al-Zawiya refinery is one of the oldest local refineries. Today it is controlled by an independent company, fully owned by the National Oil Corporation, and has become the center of the oil industry. It is a stripping and reforming refinery with a distillation capacity of 6,000 tons per year, operated by the Zawia Oil Refining Company, a subsidiary of the National Oil Corporation.

#### Processing capacity

120 thousand barrels per day.

#### Production and service units

- 1- The first refinery, which was opened in 1974 with a refining capacity of 60 thousand barrels per day, produces liquefied gas and gasoline of both types - jet fuel - diesel fuel - fuel oil.
- 2- A second refining unit was opened in 1977 with the same production capacity as the first unit, doubling the company's refining capacity to 120,000 barrels per day.
- 3- Al Zawiya and Benghazi asphalt plants, the first of which was opened in 1980 and the second in 1984, with a capacity of 200,000 thousand tons of asphalt per year.
- 4- The mineral oil mixing and bottling plant, which was affiliated with the company in 1983 and has a production capacity of 60,000 tons of different mineral oils per year.
- 5- The company's oil port: includes three offshore berths through which crude oil and petroleum products are loaded and unloaded.



## Products

Gasoline, kerosene, liquefied petroleum gas, mineral oils, asphalt.

## Contacts:

<http://arc.com.ly/>

## Arabian Gulf Oil Company



The Arabian Gulf Oil Company's refining activities, represented by the Sarir and Tobruk refineries, were entrusted on 07.01.1989 and 12.01.1990, respectively, after direct management by the National Oil Corporation.

Products of the Tobruk Refinery are pumped through a pipeline installed for this purpose to the warehouse of Brega Oil Marketing Company or by sea to the rest of Libya, and the surplus from local consumption is exported abroad using the latest methods. As for the Sarir refinery, it supplies the Sarir agricultural project with the diesel fuel needed to run the project equipment, while the rest of the product is shipped by the Brega Oil Marketing Company's overland fleet to various regions of Libya.

## Tobruk Refinery

The small Tobruk refinery is operated by the Arabian Gulf Oil Company (AGOCO), a subsidiary of the NOC.

## Refining capacity

20,000 barrels per day.

Al-Harika oil port is located in the city of Tobruk and has two berths for the shipment of crude oil produced in the Sarir and Messala fields.



The Marsa el Hariga terminal (Tobruk) is located on the south coast of the commercial port of Tobruk. Construction of the terminal started in 1964 and was completed in 1966. Marsa El Hariga Oil Terminal was officially opened after exporting the first crude oil from Sarir in 1967. Crude oil from Sarir is pumped through a 400 km pipeline with an auxiliary pumping station between Sarir and the terminal. Marsa El Hariga has three berths with a capacity of 8,000 tons per hour for tankers up to 120,000 tons (DWT)

**Contacts:**

<http://www.agoco.ly/index.php/ar>

**Sarir Refinery**

The Sarira refinery, located in the eastern region of the country, is another small refinery that returned to operation and reached full production capacity at the end of 2020 after the lifting of the NOC force majeure on the oil fields and export terminals.

The Sarira refinery was commissioned in 1989 and is operated by the Arabian Gulf Oil Company (AGOCO), a wholly state-owned company. The refinery is a small refinery fed in part by the nearby Sarir field, which is considered one of Libya's largest oil fields and contains 4.8 billion barrels of proven recoverable oil reserves.

**Products**

Gasoline, diesel, kerosene, and others.

**Refining capacity**

10,000 barrels per day.

**Contacts:**

<http://agoco.ly/index.php/ar/403.shtml>

**Brega Refinery**

Brega houses **the Brega refinery and the Marsa el-Brega terminal**, one of the five major oil terminals in the eastern half of Libya, and thus represents a critical facility for Libya's oil economy.

The refinery is operated by Sirte Oil Company, a subsidiary of NOC, and was previously operated in partnership with ExxonMobil. Brega is also the starting point of the Brega-Homs Intisar gas pipeline.

**The refining capacity** of 10 thousand barrels per day.

### **Current projects**

In October 2021, it was announced that the construction of a refinery in the south of the country, worth \$600 million over three years, would begin.



"The southern refinery will be established next to the Sharara oil field in the Ubari region, 900 kilometers southwest of Tripoli, the largest oil field in Libya with a production capacity of 300,000 barrels per day.

It will produce more than 1.3 million liters of gasoline and more than one million liters of diesel per day, as well as producing 600,000 liters of jet fuel.

As of the end of 2022, Lebanon's crude oil refining capacity is 60 percent shut down, and domestic consumption is covered by imports from abroad. Libya imports most of its oil needs, as the Zawiya, Tobruk and Sarir refineries produce 20 to 25 percent of the Libyan state's total oil consumption.

The National Oil Corporation plans to increase oil production to two million barrels within three years, as of December 2022 it was 1 million 159 thousand barrels per day, and on March 10, 2023, the National Oil Corporation announced that the production of crude oil in Libya in the last 24 hours was 1 million 213 thousand barrels.