

Background Reference: Algeria

Last Updated: March 25, 2019

Overview

Figure 1. Map of Algeria



Source: U.S. Department of State

Algeria is a major crude oil and natural gas producer in Africa and has been a member of the Organization of the Petroleum Exporting Countries (OPEC) since 1969, about ten years after it first began producing crude oil.

Algeria relies on its own oil and natural gas production for domestic consumption, which is heavily subsidized. Natural gas and oil account for almost all of Algeria's total primary energy consumption. Prices for petroleum products and natural gas in Algeria are among the lowest in Africa and subsidies

account for a significant proportion of GDP.¹ The 2016 budget law increased prices for gasoline, diesel, natural gas, and electricity for the first time in more than a decade, but the increase in prices has been marginal and failed to make a meaningful impact on consumption patterns and excess usage. Whether or not the government will follow through with more significant subsidy reductions is unclear.²

Sector organization

Sonatrach owns more than 75% of total hydrocarbon production in Algeria, and IOCs account for the remaining 20%. The Hydrocarbon Act of 2005 governs Algeria's oil and natural gas industries. In 2013, Algeria revised parts of the hydrocarbon law in an attempt to attract foreign investors to new projects. Algeria has experienced difficulties attracting foreign investors, particularly at licensing rounds.

The Hydrocarbon Act of 2005 governs Algeria's oil and natural gas industries. The Hydrocarbon Act of 2005 established terms that guided the involvement of international oil companies (IOCs) in upstream exploration and production, midstream transportation, and the downstream sector. The original 2005 legislation was more favorable to foreign involvement than its predecessor, which was passed in 1986. However, amendments to the bill were made in 2006, and some of the favorable terms were reversed. In the 2006 amendments, Algeria's national oil company, Entreprise Nationale Sonatrach (Sonatrach), was granted a minimum equity stake of 51% in any hydrocarbon project, and a windfall profits tax was introduced for IOCs.

In 2013, Algeria revised parts of the hydrocarbon law in an attempt to attract foreign investors to new projects. The 2013 amendments introduced a profit-based taxation, as opposed to revenue-based taxation and lowered tax rates for unconventional resources. The amendments also allow for a longer exploration phase for unconventional resources (eleven years compared with seven years for conventional resources) and a longer operating/production period of thirty years and forty years for unconventional liquid and gas hydrocarbons, respectively (compared with twenty-five years and thirty years for conventional liquid and gas hydrocarbons, respectively). The amendments, however, do not change Sonatrach's mandated role as a majority stakeholder in all upstream oil and natural gas projects.³

Sonatrach owns more than 75% of total hydrocarbon production in Algeria, and IOCs account for the remaining 20%, according to BMI Research.⁴ IOCs with notable stakes in oil and natural gas fields are Cepsa (Spain), BP ([United Kingdom](#)), Eni (Italy), Repsol (Spain), Total (France), Equinor ([Norway](#)), and Anadarko (United States). Sonatrach's substantial assets in Algeria make it the largest oil and natural gas company, not only in the country, but also in Africa. The company operates in several parts of the world, including Africa (Mali, Niger, [Libya](#), and [Egypt](#)), Europe (Spain, Italy, Portugal, and the United Kingdom), Latin America (Peru), and the United States.

Algeria has experienced difficulties attracting foreign investors, particularly at licensing rounds. In the licensing round in 2014, only 4 of 31 blocks were awarded. Some analysts believe that the lack of fiscal incentives to attract foreign investors to new projects and past Sonatrach corruption allegations were to blame. Algeria's precarious security environment has also been a concern for investors.

Petroleum and other liquids

Algeria first began producing crude oil in 1958. Algeria is believed to have extensive shale oil and natural gas resources, but little progress has been made toward developing these resources. Without additional upstream investment, decline rates are likely to grow, resulting in lower production.

Exploration and production

Algeria first began producing crude oil in 1958. According to Sonatrach, about two-thirds of Algerian territory remains underexplored or unexplored. Algeria is believed to have extensive shale oil and natural gas resources, but little progress has been made toward developing these resources. Oil production in areas that have already been exploited can potentially expand as well, particularly in the Hassi Messaoud, Illizi, and Berkin Basins. According to Sonatrach, the Hassi Messaoud-Dahar province contains about 71% of the country's combined proved, probable, and possible oil reserves, while the Illizi Basin, the second-largest area, contains about 15%.⁵

Algerian oil fields produce high quality, light crude oil with very low sulfur content. Sonatrach operates the largest oil field in Algeria. Other large producing areas in Algeria include the Ourhoud and the Hassi Berkine complex.

Algeria's largest oil fields are mature. Field expansions and enhanced oil recovery techniques have kept the country's oldest fields at a steady rate of production; however, without additional upstream investment, decline rates are likely to grow, resulting in lower production.

Refining and refined oil products

The country's largest refinery, Skikda, is located along Algeria's northern coastline, and it is the largest refinery in Africa. Skikda processes the Saharan blend, which derives from the Hassi Messaoud oil fields. The Algiers and Arzew refineries are the other two refineries located on the coast. The country's inland refineries, Hassi Messaoud and Adrar, are connected to local oil fields and supply oil products to nearby areas. Sonatrach considered building a 300,000 b/d refinery in Tiaret. However, the project was scaled down to 100,000 b/d and then later delayed indefinitely in October 2017. Upgrades or expansions to facilities at Hassi Massaoud and Biskra have been proposed, but whether or not they will be completed on time is unclear. The upgrade and expansion of the Algiers refinery is expected to be completed within the target completion date.⁶

Table 1: Oil Refineries in Algeria

| Refinery | Type | Owner | Feedstock | Capacity (,000 b/d) |
|----------------------|------------------------|----------------|------------------------|------------------------|
| Adrar | Crude oil | CNPC/Sonatrach | Touat oilfield | 13 |
| Algiers (El Harrach) | Crude oil | Sonatrach | Hassi Messaoud crude | 58 |
| Arzew | Crude oil | Sonatrach | Sahara crude | 81 |
| Hassi Messaoud | Crude oil | Sonatrach | Hassi Messaoud crude | 22 |
| Skikda | Crude oil | Sonatrach | Saharan crude | 355 |
| Skikda | Natural gas condensate | Sonatrach | natural gas condensate | 122 |
| Total | | | | 651 |

| Proposed Newbuild or Upgrades to Refineries | Target Completion Date | Notes |
|---------------------------------------------|------------------------|----------------------------------------------------------|
| Algiers | 2019 | upgrade/expansion |
| Hassi Messaoud | 2022 | upgrade/expansion |
| Tiaret | 2022 | petrochemical and refining complex; delayed indefinitely |
| Biskra | 2022 | NA |

Source: BMI Research, Middle East Economic Survey

Petroleum and other liquids exports

Algeria exports mostly light crude oil. The country's main crude oil grade is the Sahara blend (API–45.3; sulfur content–0.1%; and total acid number (TAN)–0.06 KOH/g), which is a blend of crude oils produced at fields in the Hassi Messaoud region.⁷

Algeria uses multiple coastal terminals to export crude oil, refined products, liquefied petroleum gases, and natural gas plant liquids. These facilities are located at Arzew, Skikda, Algiers, Annaba, Oran, and Bejaia in Algeria and La Skhirra in Tunisia. Algeria's domestic pipeline network facilitates the transfer of oil from interior production fields to coastal infrastructure. The most important pipelines carry crude oil from the Hassi Messaoud field to refineries and export terminals. Algeria does not have any transcontinental export oil pipelines.

Natural gas

Algeria's largest natural gas field, Hassi R'Mel, was discovered in 1956. The remainder of Algeria's natural gas reserves is located in associated and nonassociated fields in the southern and southeastern regions of the country. Algeria also holds vast untapped shale gas resources, but faces many obstacles to developing these resources.

Exploration and production

Algeria's largest natural gas field, Hassi R'Mel, was discovered in 1956. Located in the center of the country to the northwest of Hassi Messaoud, it holds proved reserves of about 85 trillion cubic feet (Tcf), more than half of Algeria's total proved natural gas reserves. The remainder of Algeria's natural gas reserves is located in associated and nonassociated fields in the southern and southeastern regions of the country. Overproduction and underinvestment in maintaining the Hassi M'Rel field has resulted in long-term damage to the reservoir, leading to accelerated decline rates. Sonatrach has embarked on a USD \$2 billion investment program to be finished by 2020 that would reduce the decline rates at Hassi R'Mel.⁸

The Southwest Gas Project is very important for Algeria's ability to meet contracted exports and its expected growth in domestic demand. Gross natural gas production in the country will most likely continue to steadily decline in the short term, but it may recover in the medium term if planned projects come online and offset natural declines. However, these projects are contingent on attracting investors and building new infrastructure or upgrading older infrastructure.⁹

The Southwest Gas Project includes the construction of natural gas-gathering facilities, a natural gas treatment plant, and a pipeline to the Hassi R'Mel gas hub, called the GR5 pipeline.¹⁰ The planned infrastructure will connect the remote southwest natural gas fields to the Hassi R'Mel region and allow other fields in the south to be commercialized as well. The development and commercialization of the Ahnet natural gas project in the south will also depend on the new infrastructure.

Algeria also holds vast untapped shale gas resources. According to an [EIA-sponsored study](#) released in June 2013, Algeria contains 707 Tcf of technically recoverable shale gas resources, the third-largest amount in the world after China and Argentina. Some industry analysts are cautious about the prospects of Algeria becoming a notable shale producer. To develop these resources, Algeria will face many obstacles including the remote location of the shale acreage, the lack of infrastructure and accessibility to sites, water availability, the lack of roads and pipelines to move materials, and the need for more rigs because shale wells deplete more quickly.

Natural gas exports

Algeria's natural gas exports have gradually declined during the past decade as gross production decreased and domestic consumption increased, but 2016 saw a reversal of this trend. Algeria is facing pressure to boost natural gas output with new projects to meet growing domestic demand and to fulfill long-term contractual obligations to export natural gas to Europe.

Algeria became the world's first LNG producer in 1964 when the Arzew LNG facility came online.¹¹ Algeria has four liquefaction units for liquefied natural gas (LNG) located along the Mediterranean Sea at Arzew and Skikda, although a number of the LNG facilities have been decommissioned, lowering actual production capacity (Table 2).¹²

Table 2. LNG facilities in Algeria

| Project name | Number of Trains | Production Capacity (Bcf/y) ¹ |
|-----------------------|------------------|------------------------------------------|
| Arzew LNG | | |
| <i>GL1Z</i> | 6 | 379 |
| <i>GL2Z</i> | 6 | 394 |
| <i>GL3Z</i> | 1 | 226 |
| <i>GL4Z (Camel)</i> | | 43 |
| Skikda | | |
| <i>GL1K Megatrain</i> | 1 | 216 |

¹ Billion cubic feet per year is Bcf/y.

Source: BMI Research, www.hydrocarbons-technology.com, GIIGNL 2017 Annual Report

Algeria plans to develop two additional transcontinental export pipelines, although both projects have suffered delays, and whether or not either pipeline will be built is highly uncertain. The Gasdotto Algeria Sardegna Italia (GALSI) pipeline will transport natural gas to Italy via a pipeline with a subsea section.

Initially, its capacity is expected to be 282 Bcf/y. The pipeline project has gone through feasibility studies, and logistics, costs, pricing formulas, and long-term contractual commitments are concerns. The Trans-Saharan Gas Pipeline (TSGP) is proposed to run slightly more than 2,600 miles to deliver natural gas from Warri, Nigeria, to Algeria (via Niger), which will then link to the MEDGAZ route to Spain, although this link may be changed in the future. However, security concerns about militant groups across remote areas in the Sahel, in addition to growth constraints to Nigerian natural gas production, have presented considerable downside risks to investors interested in financing the project.

Table 3: Algeria's Transcontinental Natural Gas Pipelines

| Pipeline name | Start year | Route | Length (miles) | Capacity (Bcf/y) ¹ |
|----------------------------------------------|------------|--------------------------------------------|----------------|-------------------------------|
| Pipeline Enrico Mattei (GEM) | 1983 | Algeria to Italy via Tunisia | 1,025 | 1,340 |
| Pedro Duran Farell pipeline (GPDF) | 1996 | Algeria to Spain via Morocco | 325 | 390 |
| MEDGAZ Pipeline | 2011 | Algeria to Spain via the Mediterranean Sea | 125 | 280 |
| Total export pipeline design capacity | | | | 2,010 |
| Proposed pipelines | Start year | Route | Length (miles) | Capacity (Bcf/y) ¹ |
| GALSI Pipeline | -- | Algeria to Italy | 534 | 282 |
| Trans-Saharan Gas Pipeline (TSGP) | -- | Nigeria to Algeria via Niger | 2,602 | 1,059 |

¹ Billion cubic feet per year is Bcf/y.

Source: Sonatrach, BMI Research, www.hydrocarbons-technology.com, Cedigaz

Electricity

The national electricity system consists of an interconnected network that distributes power to northern and southern parts of the country. The electricity market is unbundled, but competition is restricted to generation, and the market is regulated by the Commission for Regulation of Electricity and Gas.

According to the Electricity and Gas Regulation Commission (CREG), the country's electricity and natural gas market regulator, the national electricity system consists of an interconnected network that distributes power to northern and southern parts of the country.

The electricity market is unbundled, but competition is restricted to generation, and the market is regulated by the Commission for Regulation of Electricity and Gas. State-owned Société Algérienne de Gestion du Réseau de Transport de l'Électricité is responsible for authorizing private generation and is the sole offtaker for power generation.

Algeria's transmission network is composed of the Réseau Interconnecté National (RIN) distribution network that connects Salah, Adrar, and Timomoun in the northern area, and a number of isolated, low-voltage systems in the southern region.

Sonelgaz brought additional capacity online to keep up with demand needs. In the past, Sonelgaz imposed rationing to balance electricity supply and demand. In 2012, the government enforced power cuts that provoked public protest in the summer months. Algeria's power demand peaks during the summer months.¹³

One of Sonelgaz's main challenges is the ability to finance new generation projects amid fixed electricity prices, which have an effect on the company's finances. In addition, energy subsidies in Algeria have resulted in budget deficits. Another challenge is natural gas supply. Most of Algeria's planned capacity additions are natural gas-fired units; meanwhile, Algeria's gross natural gas production has been declining as new projects slated to boost output have repeatedly been delayed.

Renewables

Algeria has marginal hydroelectric generation capacity and does not have any nuclear generation capabilities; however, the government is looking to develop and expand its non-hydroelectric renewable generation capacity.

The Algerian Ministry of Energy and Mines set ambitious goals for electricity generation, aiming to generate 40% from renewable sources by 2030.¹⁴ The government of Algeria has since revised its 2015 goal to add 22 gigawatts (GW) by 2030, setting a new target goal for approximately 18.5 GW from renewable sources (13.6 GW of solar PV, and 5 GW of onshore wind). The government also devised a regulatory framework that requires distribution system operators to take all electricity produced by renewable energy plants that have signed a power purchase agreement, thus guaranteeing the sale of power at the agreed feed-in tariff rate. Renewable energy is still dominated by Sonelgaz and its subsidiary SKTM, and regulatory and administrative obstacles still limit the participation of international companies.

Notes

- In response to stakeholder feedback, the U.S. Energy Information Administration has revised the format of the *Country Analysis Briefs*. As of January 2019, updated briefs are available in two complementary formats: the Country Analysis Executive Summary provides an overview of recent developments in a country's energy sector and the Background Reference provides historical context. Archived versions will remain available in the original format.
- Data presented in the text are the most recent available as of March 25, 2019.
- Data are EIA estimates unless otherwise noted.

¹ "Algeria Oil & Gas Report Q1 2018," *BMI Research Service*, November 2017, pg. 27–34.

² "Algeria Ratifies 2016 Budget Despite Opposition," *Middle East Economic Survey*, Vol. 58, Issue 49, December 4, 2015. "Algeria Oil & Gas Report Q1 2018," *BMI Research Service*, November 2017, pg. 30.

³ *Middle East Economic Survey*, "Algeria Fleshes Out New Oil Law" (January 11, 2013), volume 56, issue 2.

⁴ "Algeria Oil & Gas Report Q1 2018," *BMI Research Service*, November 2017, pg. 68.

⁵ [Sonatrach](#)

⁶ "Refining and Marketing Africa: Algeria," *IHS Markit*, January 2018.

⁷ "Crude by Key Characteristics," *Energy Intelligence Group*, accessed 7/19/2018.

⁸ "Algeria Oil & Gas Report Q1 2018," *BMI Research Service*, November 2017, pg. 20–22. "Global Project: Hassi R'Mel," *IHS Markit*, accessed 8/22/2018.

⁹ "Algeria Oil & Gas Report Q1 2018," *BMI Research Service*, November 2017, pg. 22.

¹⁰ "Algeria Gas Set for Record 2018 With Start-Up of Key Southwest Fields," *Middle East Economic Survey*, Vol. 71, Issue 09, March 2, 2018.

¹¹ [Sonatrach](#)

¹² “Liquefaction Project Profile – Algeria: Arzew LNG and Skikda LNG,” IHS Markit, July 2, 2018.

¹³ Middle East Economic Survey, “Algeria’s Peak Power Demand Soars, New Capacity Starting Up” (November 6, 2015), volume 58, issue 45.

¹⁴ Algerian Ministry of Energy and Mines, [Renewable Energy and Energy Efficiency Program](#), page 4.