

ENERGY COUNTRY REVIEW

Morocco

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Country Review Morocco

Government

Morocco is an authoritarian regime with a constitutional monarchy and an elected parliament. The King holds executive and legislative powers over the military, foreign policy and religious affairs. Parliament, whose powers are limited, is bicameral.

The Assembly of Representatives (Majlis an-Nuwwâb) has 325 members elected for a 5-year term. The Assembly of Councillors (Majlis al-Mustasharin) has 270 members elected for a 9-year term.

The oil and gas industry is overseen by the Ministry of Energy, Mining, Water and the Environment.

Source: *GlobalShift*

Morocco has capitalized on its proximity to Europe and relatively low labor costs to build a diverse, open, market-oriented economy.

In the 1980s Morocco pursued austerity measures and pro-market reforms, overseen by the IMF. Since taking the throne in 1999, King MOHAMMED VI has presided over a stable economy marked by steady growth, low inflation, and generally declining government debt. Industrial development strategies and infrastructure improvements - most visibly illustrated by a new port and free trade zone near Tangier - are improving Morocco's competitiveness.

Key sectors of the economy include agriculture, tourism, phosphates, textiles, apparel, and subcomponents. In 2006 Morocco entered into a bilateral Free Trade Agreement with the United States; it remains the only African country to have one. In 2008 Morocco entered into an Advanced Status agreement with the European Union.

Despite Morocco's economic progress, the country suffers from high unemployment and poverty. In 2011, high food and fuel prices strained the government's budget and widened the country's current account deficit. Key economic challenges for Morocco include fighting corruption, reducing government spending, reforming the education system and judiciary, addressing socioeconomic disparities, and building more diverse, higher value-added industries.

Exploration History

Petroleum Exploration in Morocco started early in the last century and covers four major periods:

The period between 1912 and 1957 has known petroleum exploration in the Rharb Basin at the vicinity oil seeps. This led to the discovery of the Ain Hamra oil pool in 1923. This period saw the creation of BRPM (Bureau de Recherches

Country Key Facts

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| Official name: | Kingdom of Morocco |
| Capital: | Rabat |
| Population: | 33.93 million (2016) |
| Area: | 710,850 square kilometers (274,461 square miles) |
| Form of government: | Constitutional Monarchy |
| Language: | Arabic (official) and French |
| Religions: | Muslim |
| Currency: | Moroccan dirham |
| Calling code: | +212 |

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et d'Exploitations Minières) in 1928, and the SCP (Société Chérifienne de Pétrole) in 1929 that carried out most of petroleum exploration activities.

Seismic reflection techniques were first introduced, in the Rharb and Prerif basins in 1935 and in 1955 this tool was used to explore the Essaouira, Souss and Guercif basins. Oil and gas discoveries were made in the Prerif Ridges and in the Sidi Fili Trend. Cumulative production during this period reached 8 million barrels of oil.

From 1958 to 1981, the Hydrocarbon Law was passed and drawn international investments. Exploration by BRPM and its partners was extended to cover most of the basins of Morocco. Wells drilled during this period revealed commercial oil and gas accumulations in the Essaouira and Rharb Basins. By the end of 1981, cumulative production was 9 million barrels of oil and 35 BCF of gas.

From 1981 to 1986, ONAREP (Office National de Recherches et d'Exploitations Pétrolières) was created by the Moroccan government, with a mandate to explore for hydrocarbons in Morocco both by itself and jointly with foreign petroleum companies. Since the creation of ONAREP, 91 wells have been drilled, 50 of which were jointly with international companies. This activity led to the discovery of the gas/ condensate field at Meskala (Essaouira) and of several biogenic gas accumulations in the Rharb Basin.

From 1986 to 1999, the oil shock in 1986 had a major impact on exploration activities, which were virtually halted.

From 2000 to 2016, The Hydrocarbon Law was amended in 2000 providing Oil and Gas investors with some of the most attractive fiscal terms and has resulted in attracting more international oil companies in the hydrocarbon sector.

In 2003, ONHYM was created as a merger of ONAREP and BRPM, beginning a new era with a dynamic strategy and improved synergy to adequately assess both the Hydrocarbon and Mining Potential of Morocco.

The missions of the National Office of Hydrocarbons and Mines, established by law since its creation, are as follows;

- Contribute to the socio-economic development of Morocco through the efficient development of mineral resources (excluding phosphates) and hydrocarbons;
- To conduct, through an appropriate technico-economic approach, research and exploration of hydrocarbon and mineral deposits

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- Develop a proactive and dynamic partnership;
- Build national expertise in the oil and mining sector.

To date, 46 827 Km² of 3D seismic and 158 825 Km of 2D seismic data have been acquired offshore and 43 exploratory wells were drilled.

Also, 51 976 Km of 2D seismic and 2 076 Km² of 3D seismic data have been acquired onshore and 295 exploratory wells were drilled.

The analysis of the database of the existing wells underlines three important facts:

- The number of hydrocarbon exploratory wells is extremely low in most basins;
- Many wells did not reach their objectives due to technical problems, or were spudded off structure;
- The number of exploration concepts tested so far is very limited.

Generally speaking, Morocco is underexplored in terms of petroleum exploration and is considered as frontier zones (only 338 wells were drilled both in onshore and offshore Morocco). However, it is important to note that several viable petroleum systems, with good hydrocarbon potential, exist in Moroccan sedimentary basins.

Recent studies, integrating regional synthesis studies with substantial volumes of seismic data, particularly in the offshore, have generated new exploration concepts. These studies have also defined many plays and leads.

Currently there are two onshore producing basins: the Essaouira Basin on the west coast producing natural gas and oil (mainly condensate) and the Rharb Basin in the north of the country producing natural gas.

Shale Oil

Exploration for the recovery of oil shale in Morocco started at Tangier with the creation of the Société des Schistes Bitumineux de Tanger. The company built a pilot plant with a production capacity of 80 tons per day of oil shale between 1939 and 1945. The Timahdit and Tarfaya deposits were discovered late in the sixties.

Following the oil crisis of 1973 and 1979, research and development into the recovery of oil shale increased significantly throughout the world. In Morocco both the Tarfaya and Timahdit deposits have been the subject of

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several geological and mining studies, laboratory studies, and tests of pyrolysis and direct combustion. The oil shale from these deposits has been tested by several pyrolysis processes around the world: in the United States (Tosco, PARAHO and Union Oil); in Europe (LURGI); in the former USSR (KIVITER and GALOTER); in Canada (TACIUUK); and in Japan (JOSECO). They have also been the subject of many techno-economical feasibility studies.

Geological, mining, and laboratory studies, made between 1975 and 1985, allowed the identification of reserves in place and the characterization of oil shale in Timahdit and Tarfaya, and showed that Moroccan shale could produce hydrocarbons by pyrolysis. Morocco then initiated the T3 plant, with initial development of three deposits of Tangier, Tarfaya and Timahdit.

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Fiscal Regime

Incentives

- 25% State participation
- Royalty: Oil 10%, Gas 5%
- 10 year corporate tax holiday on discovery

Exploration Activity

Underexplored

- Current well density of just 0.06wells/100km² vs. estimated global average of 2 wells/100km²
- 3,500km of coastline, only 31 wells drilled offshore
- Many sedimentary basins remain sparsely explored
- Exploration activity on the increase
- 12 times more exploration permits than in 1997

Morocco - Energy Fundamentals

Strong Domestic Market:

- One of Africa's largest energy consumers
- Energy demand +54% over last 10 years
- 34 million population
- Key energy users: Residential, Industry, Phosphate Mines, Agriculture

Undersupplied:

- Africa's 2nd largest importer
- Morocco imports 99% of oil, 91% of gas
- No stranded reserves

Morocco is the largest energy importer in North Africa, with limited resources of its own. It is carrying out exploration work in the offshore Atlantic and Mediterranean, as well as onshore in the hope of locating commercial reserves. Its location means that it has been well placed to be a transit state between Algeria and Spain for the Maghreb Europe Gas pipeline (Pedro Duran Farell).

The country has also been a regional pioneer in the development of renewable energy capacity, with plans to generate 10% of electricity from renewable sources by early next decade.

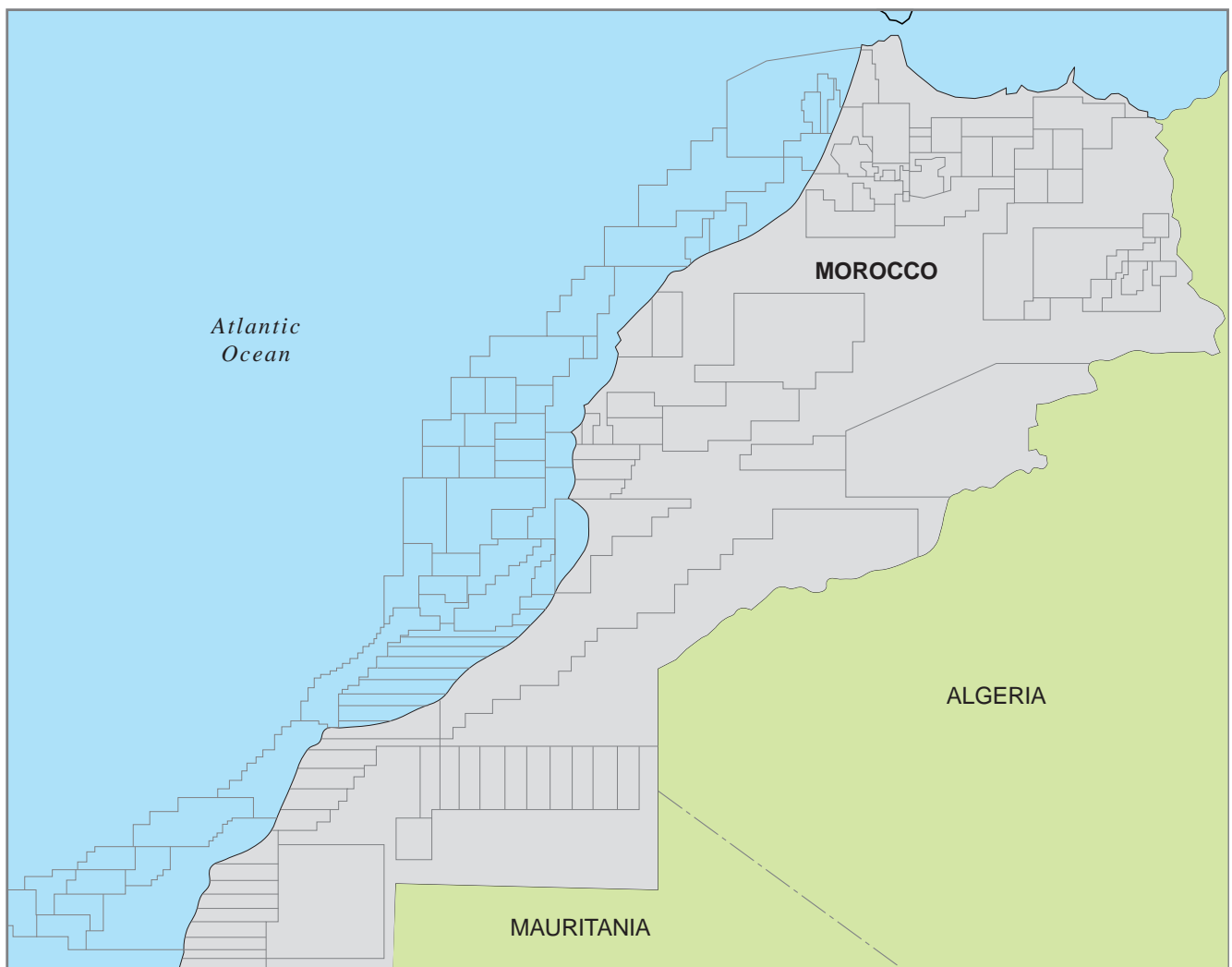
New energy

The country has one source of natural energy in plentiful supply - the sun. Morocco has 330 to 350 days of sunshine each year. King Mohammed VI is spearheading a huge solar panel scheme to make use of this energy source.

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Five solar-power plants are planned (the first near Ouarzazate, south of the Atlas mountains) which it is hoped will provide around two-fifths of the nation's energy by 2020. The World Bank's Clean Technology Fund has pledged 200 million dollars towards the nine billion dollar scheme.

Sources: IEA, CIA, ONHYM, EKFi



Source: EKFi