

Country Assessment Report

Country/Region Name- Template:

Morocco is situated in Northern Africa. It has a population of 36 million and GDP worth over \$117 billion, with a growth rate of 2.99%.

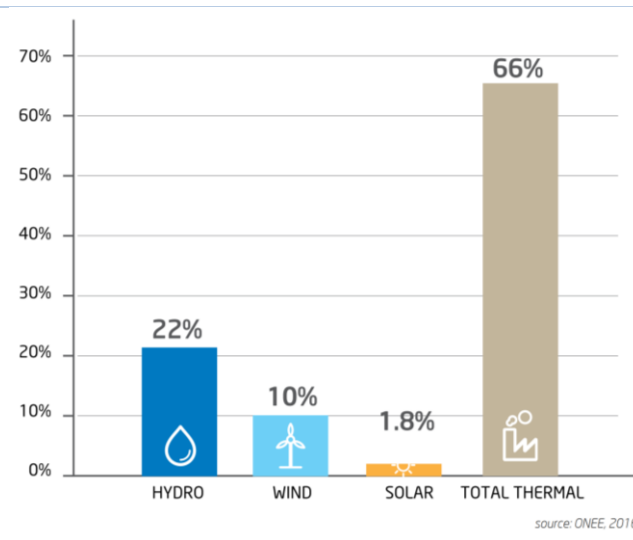
(World Bank 2018)

Economic structure and activity:

Morocco has a relatively free-market economy, following a policy of privatisation since 1993. The service sector accounts for the majority of GDP (50.01%) and economic growth, spearheaded by tourism and real estate. Industry contribute 25.92% of the GDP and is dominated by textile manufacturing, leather goods, food processing, oil refining and electronic assemblies. Agriculture remains an essential facet of Morocco's soil, accounts for 12.26% of the nation's GDP. Its rich soil facilitates the growth of a range of produce including barley, wheat, citrus fruits, grapes, olives and wine. The introduction of a new dam in Essaouira will significantly improve irrigation and thus, productivity.

(Statista 2018; Santander 2020)

Top private companies with RE commitments:



Generation and demand: (e.g. type, MW, TWh)

Source: ONEE (Activity book 2016)

Table 1. Electricity market figures for the year 2016 (Res4Med 2018).

Figure 1. Installed capacity per technology for the year 2016 (Res4Med 2018).

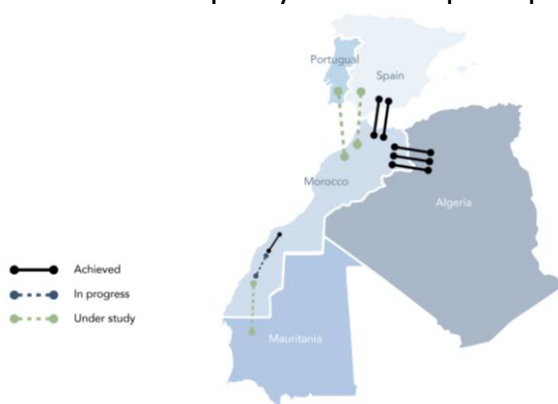
Thermal power plants dominate power production, with hydro contributing nearly a quarter of Morocco's installed capacity (see figure 2). wind energy is increasingly being harnessed, whilst solar deployment remains in its infancy.

Electricity demand is growing rapidly in Morocco, driven by a growing population, an increasing electrification rate, development of major infrastructure projects, urbanisation and improvements to civilians' standards of living.

On the basis of the scenarios developed by MEMDD, it is estimated that following a conservative scenario, demand for electricity will reach 52 TWh by 2020 and 95 TWh by 2030. On the basis of a high demand scenario, the demand will be 61 TWh by 2020 and 133 TWh by 2030. This means that the demand will double between 2014 and 2020 and will quadruple between 2014 and 2030.

Electrical Interconnection and import/export:

Morocco has electrical interconnection with Algeria through a 440kV network, capable of 12000 MW capacity. It also imports power from Spain through submarine cables



with a capacity of 1400 MW and is expected to develop interconnection with Portugal in the future.

Figure 2. A map of Morocco's electrical interconnection (Res4Med 2018).

Source: Africa Energy Yearbook, 2016

Market Structure:

The power industry is regulated by ONEE (National Office of Electricity and Drinking Water). Historically, this government entity was the sole operator for the generation, transmission and distribution of power. Significant growth in the power sector initiated a gradual unbundling of generation and distribution to IPPs, self-producers and private distributors, whilst maintaining a centralized role in transmission.

ONEE off-takes part of the electricity from IPPs from both conventional and renewable energy projects. In 2009, MASEN (or AMED) has been created to implement the IPP framework for solar projects falling under the REP (renewable energy program) established by the government. In 2016, AMED became responsible to implement the 2030 REP, with a target of renewable energy installed capacity by 2030. IPPs currently generate over 55% of power production. ONEE owned plants generated 30% and imports from Algeria and Spain account for the rest of the mix (15%). Figure 1 summarises the institutional framework in Morocco.

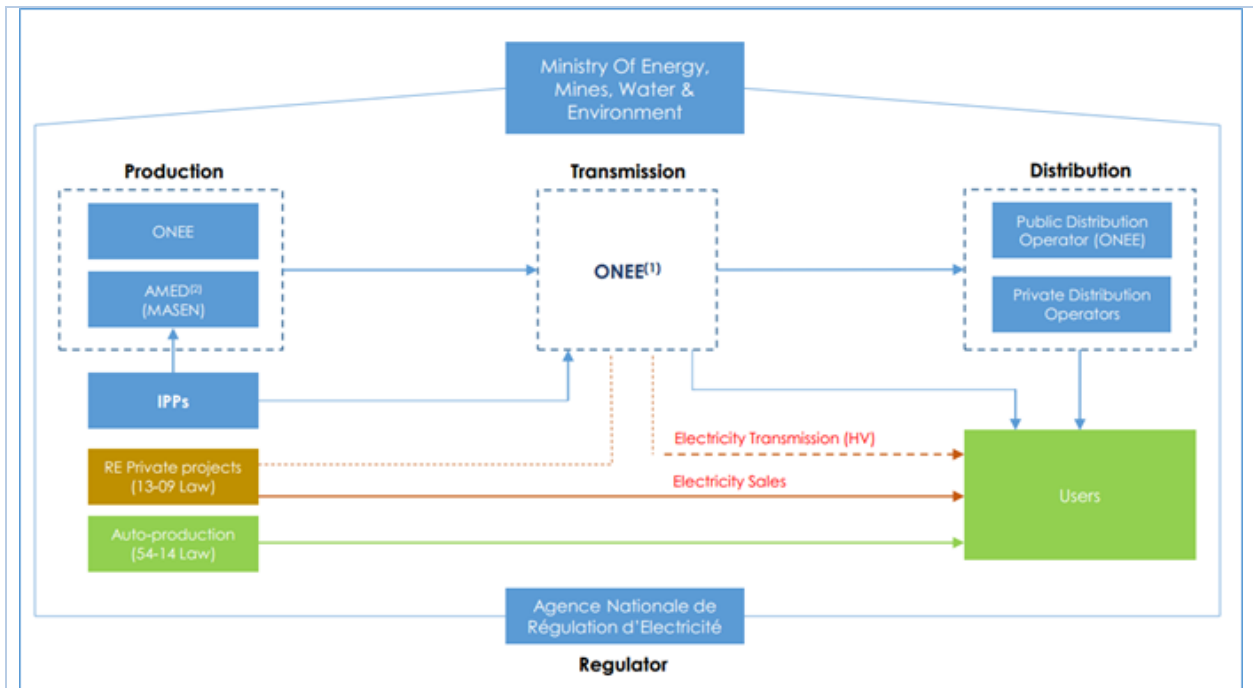


Figure 2. Market structure of Morocco's power sector.

Responsible Government Department: (include key contacts)

Ministry of Energy, Mines, and Sustainable Development (MEMDD) is the main government authority overseeing the power sector and the formulation of relevant policy. It aims to ensure the safe, reliable and affordable supply of energy. It also drafts and enforces laws and regulations concerning energy matters in the country.

Ministry of Interior (MoI) oversees the operations of privately owned power distribution companies, cross subsidies in the sub-sector and participation in tariff design and implementation.

National Agency for Electricity and Water (ONEE) is a government owned entity, acting as a major contributor to the nation's power generation. It serves as the owner and operator of the transmission grid and is the largest distributor and supplier of electricity. It is also responsible for creating masterplans regarding electricity generation and transmission.

Moroccan Agency for Energy Efficiency (AMEE) is responsible for implementing and directing energy efficiency programs, as well as national, sectoral and regional plans for energy efficiency development. It succeeded the Centre for the Development of Renewable Energy.

Moroccan Agency for Sustainable Energy (MASEN) is responsible for promoting the deployment of renewable energy projects. It produces the projects, raises the funds to finance them, and acts as a one-stop-shop. It also conducts studies on the

prospects and availability of renewable resources as well a generation capacity planning in collaboration with ONEE.

(World Bank 2012)

Existing/Planned Energy Legislation: (is there a CPO)

Dahir n 1-63-226 – originally passed in 1963 but amended several times until 2015. Its purpose is to regulate the rights and obligations of ONEE and IPPs. It has been modified to accommodate for private sector participation and market liberation of both generation and distribution.

LAW 94-503 – passed in to partially liberalise PPAs with IPPs or privately owned producers (up to 10 MW).

13-09 Law - passed in 2010 to enable HV and VHV clients to off-take power directly from IPPs and operators of renewable energy projects solely. It is being reviewed currently to include Middle Voltage users as well.

Environmental Legislation for RE:

LAW 94-503 (1994) RELATED TO PPA Partial liberalization PPAs with IPPs or privately owned producers (up to 10 MW).

LAW 13-09 – passed in 2010 to liberalise and promote renewable energy development in Morocco. It enables private participants to generate and export electricity given that they utilise renewable resources (solar, wind, geothermal, wave, tidal, biomass, waste and biogas). It provides medium and large power producers access to input their energy into the national grid. IPPs can sell electricity directly to customers connected to the high voltage and medium voltage grid, in particular industrial companies.

LAW 58-15 – amended LAW 13-09 by introducing a net metering scheme for solar and wind power plants connected to the high-voltage grid, and later, those connected at the medium and low-voltage. Private investors in renewable power are allowed to sell their surplus output to the grid, but no more than 20% of their annual production.

(Res4Med 2018)

Existing/Planned Certificate Systems: (purpose, extent)

I-REC are now active.

RE market potential:

Hydro currently exists as the largest generated of renewably sourced electricity, with an installed capacity of 1,770 MW in 2015. Overall potential is estimated to be 3,800 MW. One of the richest renewable resources Morocco can harness is solar energy. The nation receives more than 3,000 hours of sunshine and records an average solar irradiation rate of 5 kWh/m²/day. The most promising sites are believed to be in Oujda, Quarzazate, Sebkhatah, Fom Al Ouad and Boujdour. Morocco also hosts a rich wind corridor, particularly along its coastline. Essaouira, Tangier and Tetouan receive wind speeds between 9.5-11 (m/s) and Tarfaya, Taza and Dakhla have reported wind speeds between 7.5-9.5 m/s. Total wind potential is estimated at around 25 GW, of which 6 GW may be installed by 2030.

(Res4Med 2018)

Market risks and challenges:

One of the biggest challenges for Morocco's renewable energy development is lack of regulatory and investor support for small-medium sized projects, with both favouring only large projects.

Grid capacity and other technical constraints relating to transmission and distribution are other key issues. Perceived risk remains modestly high to most investors due to concerns over curtailment

(Res4Med 2018)

Extent of Engagement with Government: (brief summary of any contact already made with the national government regarding certification in general and I-REC)

Expected response from Government:

Current Environmental Reporting in Energy:

Conventional power stations are obligated to obtain an emissions permit and report to The Ministry of Environmental Protection a variety of environmental and operational parameters under the framework of the following regulations:

- Clean Air Law - The purpose of the Law is to bring about an improvement of air quality and to prevent and reduce air pollution, inter alia by prescribing prohibitions and obligations according to the precautionary principle. In accordance with the law, stationary emission sources with high pollution potential must have emission permits, which include general emissions guidelines for the sector as well as specific guidelines for the emission source.

Those conditions are based on implementation of Best Available Techniques (BAT).

- Pollutant Release and Transfer Register (PRTR) - A Pollutant Release and Transfer Register (PRTR) is a database or inventory of pollutants released to air, water, and soil by factories, and/or transferred off-site for treatment or disposal. Although it is not obligatory for the renewable generation facilities owners, as the electricity sold to the government, the generation in each facility is being monitored.

Furthermore, data regarding electricity and fuel consumption is reported regularly to the EA and to The Ministry of National Infrastructure, Energy and Water under the EA's regulations.

Any other Relevant Information:

Grid Emission Factor- the grid emissions factor is calculated by a national average emission factor. The national average is based on IEC data for gross specific emission factor (without taking into account transmission loss). The IEC gross specific emission factor is calculated by the CO2 emission per electricity unit transmitted to the grid.

Currently, no Residual emission factor is being calculated in Israel, as there is no separation between electricity generated and its environmental attributes yet.

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Preparation Date	

Code Manager Observation

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