

## Mozambique

### LOOKING AHEAD

📄 Energy policy; Mozambique;  
Renewable energy

#### **Developing renewable and sustainable energy potential in Mozambique**

Based on the available data, 88.4 per cent of the Mozambican energy mix results from traditional non-sustainable sources such as coal and fuel-wood. The lack of access to modern, stable and sustainable energy not only prevents economic growth but also contributes to major damages to the environment, thus jeopardizing sustainability standards.

Being a developing country with a very high percentage of population living below the income poverty line (60.7 per cent, according to HDI 2015), Mozambique now faces the challenge of balancing the critical needs to improve living standards and to promote environmental sustainability. Enhancing access to modern energy sources has been identified as a key step for such purpose.

At present, Mozambique has a very low electrification rate and lacks key power production and transmission infrastructure with access to modern and stable energy being mainly limited to urban areas. According to the HDI 2015, only 5.4 per cent of the rural population has access to electricity.

In the past two decades, the government struggled to implement legal instruments aimed at developing the energy sector and promoting the role of private investors in the power production and distribution industry. More recently, relevant efforts have been made aimed at developing renewable and sustainable energy.

Reference to the need to promote and implement the use of new and renewable energy sources was expressly included in the Energy Policy approved back in 1998. However, one had to wait until 2009, for the Energy Strategy and the Policy for the Development of New and Renewable Energies to be enacted.

Two years later, in 2011, the Mozambican Government approved the Strategy for Development of New and Renewable Energies 2011–2025 (in Portuguese *Estratégia de Desenvolvimento de Energias Novas e Renováveis* or EDENR) which comprises the National Programme of New and Renewable Energies (in Portuguese *Programa Nacional de Energias Renováveis* or PNENR). This latter instrument establishes the market approach to be implemented, as well as the financing structures and benefits available in order to develop the domestic renewable energy sector.

Expanding and improving the power grid and seeking sustainable and stable energy sources to address critical power needs in-country, have been identified as key goals under the foregoing instruments. More recently, said goals have been further stressed in the National Strategy for Development 2015–2035.

### Renewable Energy Atlas—key features and projects

As part of the government's actions aimed at developing the domestic energy sector, between 2011 and 2013, the National Energy Fund (in Portuguese *Fundo Nacional de Energia* or FUNAE) made a significant effort in mapping renewable energy potential in-country and carried out technical and economic pre-feasibility assessment of several target projects.

As a result of said assessment, the so-called Renewable Energy Atlas (Atlas) was published in 2014. Based on the thorough assessment made, Mozambique has an overall renewable potential of 23,026GW, of which an astounding 23,000 is solar.

Of that figure, 2.7GW could be developed easily. Both grid-connected and off-grid rural electrification projects would benefit from the exploitation of the massive solar potential available. On the other hand, the Atlas identifies a total of 1,446 potential hydro projects with an aggregate potential of 19GW. 5GW of wind potential has also been assessed. Based on the Atlas, immediate grid connection to projects with an aggregate potential of 1.1GW would be possible. The remaining sites identified face additional constraints due to the poor status of the national grid and related infrastructure.

The Atlas further identifies an overall 2GW biomass potential of which 128MW would be viable for development in the short term. Residues from forestry exploitation, agro-industrial waste, residues from the sugar industry and incineration of waste are some of the key available sources identified. Finally, geothermal potential is rather insignificant, with only 0.1GW being assessed.

Based on the Atlas' findings, the government established the goal to increase production of renewable energy up to 7,537MW, being 5,645MW hydro, 1,146MW wind, 599MW solar, 128MW biomass and 20MW geothermal.

Priority is granted to on-grid hydro projects, not only due to the potential assessed but also due to their economic feasibility and competitiveness. Six ongoing key hydro projects are worth noting: the expansion of Cahora Bassa dam and the construction of five new dams: (i) Mphanda Nkuwa; (ii) Lupata; (iii) Boroma; (iv) Lúrio; and (v) Alto Malema. However, according to the Atlas, 100 additional sites can be developed on a midterm basis, including small scale hydro projects.

On a related topic, it is also worth noting that the implementation of the so-called Backbone Transmission System Project—a double transmission line between Tete Province and Maputo and the Southern African Power Pool (SAPP) interconnected power grid—is also ongoing. Amongst others, the Backbone Transmission System is expected to improve the overall grid performance, support the government's energy policy plans and accelerate peri-urban and rural electrification programs by resolving some bottlenecks in the transmission system. Alongside with the implementation of the Backbone Transmission System, the national utility (i.e. *Electricidade de Moçambique* or EDM) is carrying out electricification and grid rehabilitation works throughout the country, which is expected to contribute towards improving access to modern and reliable energy.

Aware of the practical and financial constraints limiting and/or preventing the capacity to provide universal access to on-grid power in the near future, the government is also keen to promote and implement off-grid power systems, in particular in areas not covered by the domestic grid. The EDENR expressly provides for the so-called Isolated Off-Grid Systems (in Portuguese

*Sistemas Isolados de Energia* or SIE) and stresses their key role in improving economic and living standards of rural populations. Under the EDENR, SIE systems are deemed critical to improve access to modern energy as to fulfil basic public and private needs such as cooking, domestic and public lighting, access to communication and entertainment appliances, cooling systems and water heating systems. The government's goal is to massify access to off-grid solar and wind power systems, thus enabling access to modern energy to rural and remote populations.

### Legal framework revised

Following the approval of the EDENR, the government initiated a thorough review of the domestic legal framework governing the power sector.

One critical step towards promoting renewable energy production was taken in 2014 with the approval of the Regulations on Renewable Energy Feed-in Tariffs (FiT) (Decree No.58/2014 of 17 October 2014), which sets forth the Feed-in-Tariff applicable to power generated by independent producers with capacity lower than, or equivalent to, 10MW, located within a 10km range of the point of connection to the national grid. Different FiTs apply depending on the relevant renewable source (biomass, wind, hydro and solar) and depending on the installed capacity of the relevant power production infrastructure. The agreed FiT is valid for a three-year period following which renegotiation with the government is required.

A Power Grid Code was also approved in 2014, which establishes the technical requirements for connection of power-related infrastructure to the national grid. Additional instruments are expected to be approved in the near future including: (i) the Regulation on Quality of Service of the National Electricity System; (ii) the Regulations on Business Relations and Connection to the National Grid; (iii) the rules on resolution, mediation and arbitration of disputes between energy operators, and/or between the latter and their clients; as well as (iv) specific regulations on energy efficiency.

Other than that, the National Electricity Council (in Portuguese *Conselho Nacional de Energia* or CNELEC) is also expected to be extinguished and replaced by the Energy Regulatory Authority (in Portuguese *Autoridade Reguladora de Energia*) which shall have overall regulatory and supervisory powers over the energy sector.

The EDENR further stresses that the regulations governing the granting of power production and distribution concessions currently in force (Decree No.8/2000 of 20 April 2000 and Decree No.42/2005 of 29 November 2005) fail to cover the licensing of off-grid solutions, which are a key component of the strategy to ensure access to energy in areas currently not covered by the national grid. Hence, establishing simplified procedures for the licensing of renewable energy off-grid projects has been recommended although specific regulations on said matter are yet to be approved.

### Stay tuned

Under the Clean Development Mechanism provided under the Kyoto Protocol, developing countries are encouraged to implement emission-reduction projects, such as renewable energy projects. Further, several international initiatives, financing instruments and multi-donor programmes aimed at supporting the development of markets for renewable energy in Africa have been implemented. Overall, the combination of the foregoing factors contributes to the widespread interest in the African market to develop clean energy projects.

In recent years, Mozambique took important steps aimed at capitalising on this trend. By making available feasible and accurate key information on domestic renewable potential and adapting the domestic legal framework,

the government aimed at creating the appropriate legal environment to attract forward-thinking energy companies and benefit from the various financial instruments and programmes available.

Other than that, experience tells us that developing countries tend to capitalise technological advances available worldwide by implementing state of the art technology in critical sectors and bypassing “traditional” options implemented in developing countries. Alongside with the anticipated shift towards clean and sustainable energy, Mozambique can also take a giant leap towards increasing domestic rates of access to modern energy by adopting and/or promoting cutting edge renewable off-grid technology.

Opportunities in both commercial and small-scale, on-grid and off-grid, projects are popping up and the government is keen to attract foreign investment to minimise domestic financial and currency instability. Despite the typical challenges investors often face in developing countries, Mozambique does have a rather investor-friendly environment and has managed to implement sophisticated regulations during the past decade. Given the prospective increase of energy demand, the positive outlook for the development of the domestic energy sector and the envisaged boost of the renewable and off-grid technology in-country, Mozambique is certainly a destination worth noting for pioneering energy companies.

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