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Angola boosts electrification and renewable energy

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▲ The Luena photovoltaic park opened in April 2024 – located in the province of Moxico, in Angola, it has an installed power of 25.3 MW and was built by Portugal's MCA Group to supply 59,483 people

Photo: MCA Group

Angola may be a hydrocarbon rich country in south-west Africa, but it is increasing its electrification rate and diversifying its energy sources to meet the United Nations' Sustainable Development Goals (SDG). That said, experts warn that private investment is urgently needed for the country to maintain this forward-looking policy, writes Andreia Nogueira.

In 2021, Angola had 5,880 MW of installed power capacity, but only 42.8% of its 35 million inhabitants had access to the national electricity grid, according to the ***Renewables in Angola – national status report***, launched in 2022 by the Angolan Renewable Energy Association (Associação Angolana de Energias Renováveis – ASAER) and the Lisbon, Portugal-based Lusophone Renewable Energy Association (ALER). It is a country where of the 37 million population more than a third, almost 13.5 million, live on less than $2.15/d, **according to the World Bank**.

That encourages the use of off-grid renewables, with the World Bank authors noting that: 'The commitment to new renewables is reinforced by the dispersion of rural settlements, and by the fact that the transmission grid connected to the major producing plants still does not reach all the provinces.' The Bank adds that the ongoing work to connect all the provinces to the country's electricity distribution system is not economically sustainable, especially considering the low population density.

The International Energy Agency's (IEA) Lead Energy Access Analyst Gianluca Tonolo also sees more growth opportunities for the sector. He says that considering almost 15% of Angola's households own a gasoline or diesel

generator for either grid back-up or primary electricity supply, ‘there is a big opportunity to switch to solar photovoltaic (PV) home systems and mini-grids’. This is especially so, given that the government is gradually phasing out gasoline subsidies, and solar PV systems with batteries are becoming increasingly economically viable for families. While currently, he adds ‘only few households’ have a solar PV system in Angola, leaving a relevant space for growth.

In its **National Development Plan 2023–2027** the Angolan government envisioned an on-grid electrification rate increasing to 72% in 2050, with the share of renewable energies in power production, including hydroelectric, increasing from 64% in 2022 to 94% in 2050.

Victor Fontes, President at ASAER says that this lack of transmission has left the country with excess power production, ‘with the country currently having an installed capacity that is much greater than the demand’. Moreover, recent production investments have been green. ‘This investment has mainly been made in renewable energy,’ he says.

Fontes adds that today the total installed capacity for electricity production in the country is 6,129 MW, with ‘a clear predominance of renewable energies (hydro and solar PV)’; 3,793 MW involves hydro production, 1,983 MW thermal production from natural gas and diesel, 14 MW hybrid production (solar and diesel) and 337.5 MW solar production.

‘In addition to hydro, photovoltaic is the sector that appears most favourable [for investments], given the existing potential, with levels of solar irradiation that are among the best in the world,’ says Fontes.

Rita Marouço, Project Manager at ALER, says that Angola is achieving its goals, ‘with the installation of new solar and hydro plants that this year actually supplied 91% of the electricity consumed in Angola, and much of the thermal park on stand-by’.

She considers that Angola is a good example of the renewable energy transition because ‘the renewable combination of hydro plus solar has already made it possible to “dethrone” thermal power plants’.

> ***‘In addition to hydro, photovoltaic is the sector that appears most favourable [for investments], given the existing potential, with levels of solar irradiation that are among the best in the world.’ – Victor Fontes, President at the Associação Angolana de Energias Renováveis (ASAER)***

Oil and gas as a crutch for renewable energy

To keep growing sustainability in its National Development Plan 2023–2027, the Angolan government set several goals, including ‘to explore opportunities to monetise renewable potential and production capacity’ and ‘approve specific legislation for the renewable energy sector to increase private participation...’.

The government also wants to implement a green hydrogen project run by Angola’s national oil company Sonangol and the German firms Gauff and Conjuctta. The project at the Barra do Dande marine oil terminal, close to the capital Luanda, will use 400 MW of electricity generated from a **2 GW hydroelectric plant**, making green hydrogen for local consumption and export to Germany.

The document also includes plans for ‘the participation of the oil and gas sector in the national decarbonisation process’, accepting that it ‘will continue to be one of the main drivers of the economy’, while it seeks to reduce its greenhouse gas emissions.

According to the Energy Institute's latest (2024) ***Statistical Review of World Energy***, Angola is second only to Nigeria as sub-Saharan Africa's largest oil producer, producing 1.15mn b/d of oil in 2023 compared to Nigeria's 1.54mn b/d. It is among the top main natural gas producers in sub-Saharan Africa, so debarbonisation efforts could have a significant impact.

The plan seeks to achieve this through more efficient operations, optimising 'fiscal and operational conditions to attract and retain private investments' and helping this transformation.

Marouço says that oil and gas 'generate almost three-quarters of the country's export revenues, but they have a marginal weight in electricity production'. Indeed, she suggests that 'the challenges of bringing electricity to the entire population… could be partially addressed by cross-financing revenues from the exploration and export of fossil fuels'.

Private investment needed

While this earns the government money which it can spend on developing renewables, Fontes argues that more private investment is needed. He gives the example of a 25 MW solar PV plant which was launched last year (2023) in Namibe, south-west Angola, by a consortium, Solenova, that includes the Italian oil and gas company Eni, the UK's BP and state-owned Sonangol. Next year, a new private 35 MW solar plant will be in place thanks to France's Total Energies, Sonangol and Angolan company Greentech.

Fontes also wants to see a regulatory update for renewable energy, 'in particular for green mini-grid solutions and solar home systems, essential for rural areas', he says.

He wants a system that attracts private investment for distribution, 'which mainly implies a tariff reform', as Angolan distribution tariffs are low and subsidised. That stifles earnings, with the fixed tariff of Angolan Kwanza AOA14 /kWh ($0.015 cents/kWh), explaining that this means 'all projects

must have a set of guarantees that only the state can assume, which makes the process not very expeditious'.

Moreover, Fontes warns that more efficient solutions are needed, 'with lower costs per connection point, so that the investment can reach a greater number of beneficiaries'.

He calls for a competition strategy with private players and 'clear rules, allowing the use of optimised solutions, adapted to each location'.

Marouço agrees that more legislation is needed, such as establishing a National Rural Electrification Fund, which was planned several years ago to electrify rural areas with public funds. Adding that such reform should also include private capital 'through the attribution of concessions and/or support for mini-grids and home solar systems (solar kits) to the private sector'.

Recalling that there is a 'social tariff' to help the population with fewer resources to pay the bills, Marouço warns that: 'If the tariff for other types of consumers is not revised, particularly for industry, in order to support all the costs of production, transport, distribution and marketing, the sector will not be sustainable and will hardly be able to support the investments necessary to guarantee a universal and quality access to the entire population.'

She adds that the electricity sector is also financially unsustainable 'because many consumers do not pay for the electricity they consume', therefore she also suggests the installation of more prepaid meters.

Marouço adds that there is a need for 'new decentralised production and distribution structures', which requires large investments. Private investors should distribute electricity with mini-grids, 'from the moment it will be possible to grant a concession to a private party for... generation, distribution and commercialisation of electricity in a given area'.

Furthermore: ‘Private investments... will allow electricity to be transported to new regions, even if they later require investment in distribution.… They will generate new financial flows that can make public companies more sustainable and will allow them to invest in distribution,’ she says.

Marouço wants to see law reforms to open private investment for transmission projects, including [international] interconnections, allowing independent producers to access more clients.

She adds that Angola, like fellow Lusophone (Portuguese-speaking) southern African country Mozambique, ‘aims to become a producer of renewable energy in the region through the development of new transmission lines that can connect the country with its neighbours and, consequently, supply them with surplus electricity from new renewable plants’.

‘To attract private investment, it is necessary to open the market through the establishment of energy purchase contracts… in which the state grants the concession of electricity production to independent energy producers.’ She points out that: ‘We are aware of several companies with interest and willingness to invest in renewable generation projects in Angola, waiting for the government... to decide to implement contracting procedures for independent producers in accordance with international rules.’

Considering the risks of investment in this segment besides the lack of regulation, and high interest rates (base rates have been 19.5% since May), Marouço suggests ‘the creation of payment guarantees by the Angolan government for investors and new financial models that allow for the recovery of investment, given current low electricity tariffs for end consumers’.

In early July (2024), João Baptista Borges, Minister of Energy and Water, was quoted by the Angolan press as saying that legislation is being created which will allow more independent production and tariffs that reflect lower costs. He

mentioned the imminent creation of an electrification agency to give rural energy projects economic viability, supported by multilateral sources of credit.

In November 2023, Luanda and the European Union (EU) also signed a Sustainable Investment Facilitation Agreement, the first EU agreement of its kind, in response 'to Angola's ambition to diversify its economy beyond the oil and gas sectors, which historically attracted most foreign investment'. Among the confirmed **opportunities for investments** are green energy, according to the European Commission.

With such rich natural resources to produce clean energy, such policy and legislative reforms in Angola may boost investor's confidence in this emergent and promising renewables market.

- *Further reading: '**Light at the end of the tunnel: solar mini-grids are the solution to energy access**'. Affordable, reliable and clean energy is essential to sustainable human development. Ensuring everyone has energy access by 2030 is the seventh United Nations Sustainable Development Goal (SDG 7). However, some 685 million people had no electricity and 2.1 billion had no clean cooking fuel in 2022. Connecting this considerable demographic to renewable energy that won't harm their health or the environment is a major challenge.*
- *Top low-carbon innovators from **Africa claimed every international category in the 2024 Ashden Awards**, an annual scheme that recognises green jobs, skills and livelihoods from the public, private and non-profit sectors in the UK and the Global South.*