By Tom Kenning

EMERGING MARKETS BRIEFING

The latest developments from solar's newest markets

Nigeria signs first ever solar PPAs

The solar industry has often decried lengthy delays in the West African market. Time periods for signing power purchase agreements (PPAs) can stretch into years and this only makes financing more difficult with extortionate costs of capital from domestic lenders. However, July saw a cornerstone moment when state-owned power body, the Nigerian Bulk Electricity Trading (NBET), signed Nigeria's first ever solar PPAs. This was no minor accomplishment given that they related to just under 1GW of solar PV projects to be implemented by at least 10 developers. There may also be more projects in the pipeline.

Nigeria has the largest solar targets of any country in West Africa by some distance, but until now large-scale projects had been thwarted by lack of movement on both PPAs and financing.

The 975MW of projects now signed, which would account for more than 20% of the country's current total electricity generation, have a tariff of US$0.11/kWh.

Omotayo Dairo, founder and chief executive of Nigeria-based wind and renewable energy firm Quintas Renewable Energy Solutions, says: "This is significant because prior to this signing of agreements, prospective investors in solar electricity in Nigeria had said that a tariff of US$0.18/kWh – an NBET offer – was unprofitable for solar electricity generation."

The first official project to be implemented under a 20-year PPA is a 75MW solar plant worth US$146 million in Katsina state, to be developed by European and Nigerian utility-scale investor and developer Pan Africa Solar, in collaboration with JCM Capital, an Ontario-based private equity firm. The project has been under development since 2011 so the PPA signing marks a significant breakthrough following years of stagnation.

Among other projects, NBET also signed for an 80MW plant to be developed by Canadian energy company Nova Scotia Power Development Limited (NSPDL) and partner CDIL, a fellow Canadian renewable energy company with projects focused on Africa.

The President of Nigeria gave a Voluntary Renewable Energy Portfolio Standard (VRPS) commitment of 20% on behalf of the nation at COP21 in Paris in 2015. As a result, successful execution of these PPAs could put Nigeria on a comfortable position to meet this national VRPS commitment on renewable energy from solar electricity generation alone.

Credit Flickr, canonim

Delays in PPAs had stalled solar in Nigeria until now

"Our concern for now is that this tariff is denominated in US dollars while electricity consumption charges will be collected in Naira," says Dairo. "The volatile fluctuations in exchange rate in Nigeria may create some problems during the implementation of tariff collection. When the agreements were signed, the naira was exchanging for NGN197 to US$1. The exchange rate has now gone up by over 160% since the signing of the PPAs."

A skills gap in the local labour market is also a major challenge, adds Dairo. Investors will have to build the capacity of their local staff to deliver their services efficiently.

While the PPA signing is a positive move forward, it remains to be seen whether developers will be able to secure financing.

"Local financing for renewable energy service providers in Nigeria is non-existent," says Dairo. "One presumes that the promoters of the solar power plants have already secured foreign finances for their businesses. Reliance on local financial support may be a mirage."

The steep drop in solar module prices worldwide will have helped the signings at these low tariffs. This may spur growth in renewable energy given that Nigeria saw a 100% electricity rate hike in January as it – like many countries in Africa – starts to make the transition to consumers paying for electricity rather than relying on only hydro or other technologies.

Lowest ever African solar tariffs in Zambia

Zambia set a new benchmark for low-cost solar power in Sub-Saharan Africa in June with a competitive auction, which saw winning bids as low as US$0.0602/kWh.

The auction came under the 'Scaling Solar' programme, formed by a partnership between IFC and the World Bank.

The winners of the auction were France-based developer Neoen and American integrated PV firm First Solar, who jointly bid at just US$0.0602/kWh, and Italian company Enel, which bid US$0.0784/kWh.

"This auction could be a game changer as it shows what a renewable IPP requires to have a competitive bid in Africa," says Romain Desrousseaux, deputy chief executive of Neoen. "Under such conditions, solar is more competitive than most conventional solutions and can be deployed very quickly. But it requires political will to set up a quality framework."

First Solar bid for a 47.5MW AC project that is scheduled to be completed by mid-2017. The power plant, named after Zambia's West Lunga National Park, will cover an area of just over 52 hectares. The plant will be located in the Lusaka Multi-Facility Economic Zone, with the International Data Corporation (IDC) retaining a 20% stake in the project.

Energy generated by the plant will be sold to state-owned utility ZESCO under a 25-year PPA. The facility will be powered by around 450,000 First Solar modules, which offer up to 6% more energy in Zambia than conventional crystalline silicon modules, due to a superior temperature coefficient, according to a First Solar spokesperson.

On the other hand, Enel will build a 28MW plant. The new facilities are expected to expand the country's generating capacity by 5%.

"The Scaling Solar tenders have been organised by the World Bank in order to avoid some of the most critical issues with solar tenders," says Desrousseaux.

The benefits included well-designed legal documentation, World Bank guarantees and pre-approved documentation, and permit the reaching of a quick financial close. The project sizes were also significant for Sub-Saharan Africa at nearly 50MW, combined with a good tax regime and a strong PPA in US dollars.

Indonesia introduces first solar feed-in tariff

Indonesia has seen very few support mechanisms for solar except for a half-baked solar auction process for 140MW in 2013, which only saw 14MW awarded. As of 2015, Indonesia had just 84MW of utility-scale solar capacity deployed.

However, the Ministry of Energy and Mineral Resources (MEMR) introduced the country's first ever feed-in tariff (FiT) for solar in July this year to help kick-start the development 250MW of PV.

The original auctions were stopped in 2014 after being declared unconstitutional by the Supreme Court, says Maggie Kuang, analyst at Bloomberg New Energy Finance (BNEF). The Indonesian Solar Module Manufacturer Association (APAMSI) filed a lawsuit against auctions arguing that solar developers were not using enough local content; therefore violating Industry Ministry regulations. The criteria for the auctions also lacked clarity and were ineffective in attracting good project developers, adds Kuang.

Under the new decree, projects will have 20-year power purchase agreements (PPAs) and the tariff rates will range between US$0.145-0.25/kWh depending on project location. Java has been allocated the highest capacity of 150MW, but also the lowest tariff, with individual project sizes capped at 20MW.

A Bloomberg New Energy Finance (BNEF) report said that the new FiT for solar should generate attractive project returns of around 14-18.8% in the two regions Java-Bali and Sumatra. Both have better grid infrastructure and potential project sites than other districts, where developers may struggle to obtain such attractive rates.

At a wider level, Kuang says if the developers in the far eastern part of Indonesia can keep project capex at around US$1.3 million/MW, they will be able to generate returns of more than 10%. However, some project developers believe they will not be able to achieve such returns due to the quality of infrastructure in Indonesia at present.

Developers will need to complete <10MW projects within 12 months and >10MW plants within 24 months to avoid triggering penalties of between 3-8% in the first year of delay.

To qualify for the FiT, developers will also need to have 43.85% of their solar project content sourced from domestic manufacturers and service providers based on the current Industry Ministry regulation.

However, it is not clear how local content will be precisely measured and to what extent it will prevent developers from using imported solar modules and inverters, adds Kuang. After further clarification, if the local content rule will suppress imports, domestic capacity will need to be ramped up over the coming year as there is just 90MW of domestic manufacturing capacity at present, equal to just 36% of the FiT capacity quota.

Flickr, Bart Speelman

Java-Bali and Sumatra are the most attractive regions

Nevertheless, the time leading up to construction is expected to be at least 16 months from the day that registration opens, so there is time to generate this capacity, according to BNEF.

Kuang says that the FiT rates will be proportional to the amount of local content in the project. For example, if a project has half the required percentage of local content, then its FiT will also be reduced by half.

BNEF calculates the levelised cost of energy (LCOE) for PV in Indonesia to range from US$0.89/kWh to US$0.229/kWh.

"In terms of future capacity forecasts, it is very hard to say at this stage because the policy is not implemented yet," adds Kuang. "Assuming the policy implementation starts from end-2016 or early-2017, around 200MW in Java, Bali and Sumatra are likely to be built over the following three years as the project economics in those regions support."

Not long after the decree was announced, Indonesia's energy and mining minister Arcandra Tahar was dismissed after reports that he had dual citizenship for the US and Indonesia. However, Kuang says: "It will have little impact on the direction that Indonesia is taking on developing renewables."

"Furthermore, the IFC has proposed concessional debt for the project, which allows developers to have a very competitive cost of funds," adds Desrousseaux.

The development of solar energy has been a priority for the Zambian government, he adds. Furthermore, a "very positive" move has been to start with defining the optimal set-up for a PV investment, working with the World Bank. Under their Scaling-Solar scheme, the pricing can be much more aggressive than under a less robust legal solution where more risks remain with the investor.

Other qualities of Zambia as a solar market are its strong irradiation levels and the absence of any kind of local content requirement, which prevents price and quality distortions, adds Desrousseaux.

"We believe Zambia can be a strong market if it continues to operate under efficient guidelines such as the one defined by Scaling Solar. The fundamentals are good: it has good solar resources, the grid can absorb more solar and the country needs energy."

Credit: First Solar

Zambia's government has prioritised solar energy

Argentina confirms 300MW solar auction

Argentina made this section in the previous edition of *PV Tech Power* after a series of big solar announcements in Q1, which although lacking in substance, were a welcome signal from a country that had had negligible movement on solar to date. However in the quarter just gone by, the energy ministry has confirmed a 1GW renewable energy auction and a significant 300MW set-aside for solar PV.

The initial announcement was followed by news of a slight two-week delay in the date for publishing results to 12 October this year. Bids will be accepted until 5 September.

There is potential for problems to arise considering the issues seen in the recent Mexico solar auction where there were issues with results due to a faulty internal algorithm.

"It's entirely possible that something happens like that," says Manan Parikh, analyst at GTM Research. "They have already pushed back the publish dates and built in a little bit of a buffer, but I don't think we are going to see anything as drastic as Brazil in terms of cancellation."

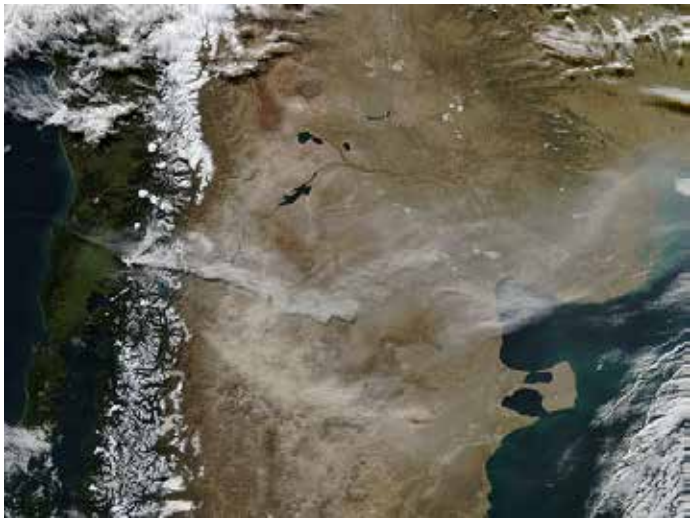
The signals remain positive in terms of policy structure and progress, adds Parikh, however successful developers will only have a two-year timeframe to complete their projects.

"That is really ambitious for a country that doesn't have much renewables on the ground as it is," says Parikh. "They have a supply deficit that they are trying to cover and their currency is still attempting to rebound – granted they have paid back a lot of their creditors in terms of their existing debt."

Countries with Argentina's experience can be expected take a little more time to get projects off the ground even if driven by a renewable energy target of 8% by 2018. "While those are great targets to have, I think developers may run into problems such as securing financing," adds Parikh.

Developers will have access to tax benefits under the Renewable Energy Development Program as well as World Bank guarantees. Nevertheless, Parikh says project completion dates are still likely to be pushed back to late 2018 or early 2019. Delays are less likely to happen if a major developer that is well established in the region takes the whole capacity. Parikh cites Italian energy giant Enel as a possibility given its strong progress in Brazil and other Latin American markets. He claims that if the capacity is shared out between five or six developers then delays are highly likely.

Wind, biomass and small hydro power technologies will also be represented at the auction. The new policy complements Argentina's first movements in Q1, when a renewables policy was introduced and new president Mauricio Macri revealed plans to establish 3GW of solar in Northern Argentina. There were also early signs of a 700MW development in La Rioja. ■



Credit Flickr: NASA Goddard Space Flight Center

Developers will only have a two-year timeframe to complete their projects