

Two steps forward, one back

Conference report | In April, the deployment of solar in West Africa came under the spotlight during a two-day event in Accra, Ghana. Reporting on the event, Ben Willis heard huge excitement over the prospects for solar in the region tempered by the realities of scaling up a new technology in a challenging part of the world

The inaugural Off-Grid Solar and Renewables West Africa event held in Ghana in April offered some tantalising glimpses of what could be in a part of the world that arguably stands to benefit most from PV technology. With some of the lowest electrification rates on the planet, solar in all its forms – grid-connected, off-grid, hybrid – has huge potential to light the region up, and this optimism was much in evidence.

Yet also plain to see were frustrations over the realities of translating that promise into projects on the ground. Factors including inadequate grid connections, slow-moving policy and a paucity of financial incentives were all highlighted during the course of the event as being major challenges for the region. Overall, the message was that while West Africa is ripe for a solar revolution, a number of hurdles – political, logistical and fiscal – must first be overcome.

The event was opened by Ghana's deputy power minister, John Jinapor, who spelled out why his country is looking to solar and other forms of renewable energy to bolster its ageing energy infrastructure. Over half of Ghana's power comes from hydro, notably the 1960s-era Akasombo Dam. Back-up power is provided from a fleet of thermal plants powered by gas largely imported from Nigeria. Both sources of power have of late become unreliable, the dam because of lower water levels in Lake Volta and the thermal plants because of fluctuating gas supplies.

"That is why as a government we took a decision to pass the Renewable Energy act 832, in order to diversify more – through wind, through solar, biomass, mini-hydro and all the other sources," Jinapor said. "That way we have a much more diversified energy mix. If water levels go down, if gas flows have a problem, we can depend on solar and wind."



Source: Nathalie Bertrams.

The act sets a 10% renewable energy target by 2020 and is backed up with feed-in tariff and net metering policies. The FIT has already proved partially successful, particularly where solar is concerned, eliciting project proposals totalling over 2GW from prospective solar developers.

On one level this is an astounding success for a country where renewable energy so far only accounts for some 0.2% of the generating capacity. But equally, it has presented Ghana with something of a headache, as the amount of solar proposed and provisionally licensed by its Energy Commission is almost as much as the country's entire current generation capacity of 2,845MW. Compared to some West African countries, Ghana's electricity grid infrastructure is fairly well developed, with electricity access approaching 80%. But the prospect of integrating over 2GW of utility-scale solar capacity into a comparatively weak grid system is clearly one that has Ghana's authorities in a fix.

This fact was explored by Wisdom

West Africa is a promising region for solar at all scales.

Ahiataku-Togobo, director of renewable energy at Ghana's Ministry of Energy, who pointed out that countries such as Germany that have high levels of solar penetration also have reserve power capacity to back up variable sources such as solar. "This unfortunately is not the case in Ghana. We have our peak load in the evenings between 6 and 12 midnight, when the sun is not available," he said.

This scenario has prompted Ghana's authorities to impose a brake on the country's utility-scale solar market, even before it has taken off. Ahiataku-Togobo explained how following a study of Ghana's grid capacity, the decision had been taken to impose a temporary cap of 150MW on utility solar development. Within this cap, projects will be limited to 20MW if connected to the transmission network or to 10MW if feeding into the distribution network. The exceptions to this rule are solar projects that are planned with appropriate storage or back-up power provision.

"We have set this limit to see how it will impact on the grid. And once we get

this done successfully and there is no significant impact on the grid, then the target will be increased to levels that the grid will be able to afford," said Ahiataku-Togobo.

Off the grid

Of course utility solar is only one part of the equation in West Africa – perhaps more exciting for a region with only limited grid capacity are the prospects offered by distributed and off-grid technologies.

Mahama Kappiah, executive director of the ECOWAS Regional Centre for Renewable Energy and Energy Efficiency (ECREEE), said that to meet the UN's 'sustainable energy for all' objective, which aims to improve both access to and cleanliness of power, West Africa would need to see the mass deployment of stand-alone power systems, mainly powered by solar.

"At the ECOWAS level, to meet the targets of sustainable energy for all we would need 262,000 stand-alone systems," he said. "Within this region we have countries like Liberia Sierra Leone, Guinea or Mali with only one transmission line – not like Ghana, which is one of the few with a transmission network.

"In most countries it is a lot more expensive to get power through the grid than to have stand-alone power. So that is how we estimated we would need up to 262,000 stand-alone systems in order to attain the target. And most of it in this region is going to be from solar."

This theme was taken up by Simon Bransfield-Garth, CEO of UK off-grid technology firm, Azuri. Bransfield-Garth used the event to launch a programme that will see 100,000 of Azuri's pay-as-you-go solar systems installed in households across rural Ghana.

Speaking separately to PV Tech Power, Bransfield-Garth said recent years had seen a growing recognition that grid power will remain a distant prospect in some parts of rural Africa for some time to come. "If you were to ask governments three to four years ago what was electricity, they would have all talked about grid electricity," he said. "I think there's a realisation now that there's going to be a variety of different electrical services to people and there are going to be people for whom grid electricity is going to be some way off. So rather than have a world of haves and have-nots, what we're trying to do is to provide an appropriate level of

power to people who aren't going to get the grid."

Political framework

In Ghana, the renewable energy act makes provision for off-grid renewable power systems, including a renewable energy fund aimed particularly at rural areas. The country also has a net metering policy in place to encourage businesses and public institutions such as hospitals and government departments to deploy solar systems.

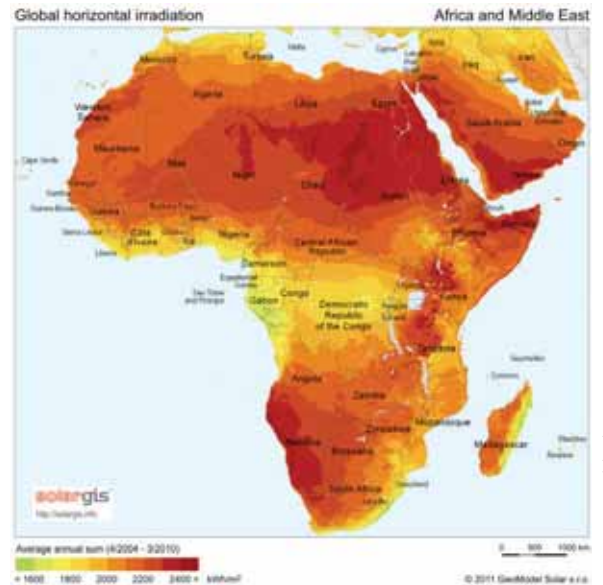
Kappiah underlined the importance of policy frameworks such as Ghana's to entice the investors needed to propel forward the deployment of renewables in West Africa. "I can assure you no utility will do this, no ministry will do this – it will be the private sector," he said. "And for private sector to come in, we have to create the necessary environment within our countries."

Kappiah described the work his organisation, ECREEE, is doing to support ECOWAS governments to draw up renewable energy plans and frameworks. Most countries in the bloc now have such plans in place, he said, and a few – including Liberia and Niger – even have feed-in tariff policies.

But using the example of Ghana Kappiah pointed out that even having such policies in place was no guarantee of success. "The [FIT] we have in Ghana is not actually implementable. As we have seen with Ghana, lots of people have come in, but nothing is moving because there are too many question marks attached to the FIT," Kappiah said.

Clearly this struck a chord with members of the audience, with one representing a major Chinese module manufacturer suggesting moves such as the one by the Ghanaian government to put the brakes on solar deployment would be damaging.

"People started to come to register projects, and then all of a sudden the ministry and energy commission say look, this isn't going to happen, so put on the brakes. It's quite difficult for developers – these are developers who play in the megawatt and large scales, so they come and make feasibility studies and things, and all of a sudden they're told their project they cannot do it and it has to be 20MW. It becomes a disincentive; it doesn't matter how peaceful the country is, that's still a risk factor for developers to consider," the delegate said.



Source: GeoModel Solar.

West Africa has attractive irradiance resources

Professor Abubakar Sani Sambo, chairman of the Nigerian Member Committee of the World Energy Council, echoed these concerns over the continued prevalence of risks for would-be renewable energy investors in West Africa. Alluding to the situation in his home country, Sambo highlighted a number of constraints "that bedevil the sector".

"Essentially it's a lack of law, lack of financial incentives and a problem of capacity building and infrastructure deficiency that has not allowed this situation to move on," he said.

In Nigeria he said renewable energy currently only accounted for a fraction of one percent of the country's total generation capacity. He said he hoped Nigeria under its new president, Muhammadu Buhari, would recognise the importance of renewable energy in boosting the country's erratic power supply. There are some positive signs, with a renewable energy law currently in draft form awaiting approval and enactment by Nigeria's national assembly and a draft FiT proposal expected soon, Sambo revealed.

Summing up the prospects for solar in Nigeria, Sambo said: "It's a very big task, but once the political will is there we'll get there."

That could indeed be said for much of the rest of the region.

Solar & Off-Grid Renewables West Africa was organised by PV Tech Power's publisher, Solar Media. For further information on Solar Media's international portfolio of events, visit www.solarenergyevents.com