

Emerging market briefing

GOING LARGE IN SUB-SAHARAN AFRICA



Credit: SunFunder

Utility PV | Despite enormous potential, Sub-Saharan Africa still has only a handful of operational large-scale PV power plants. Ben Willis reports on the ongoing efforts to help utility PV take root in a part of the world where it makes perhaps most sense but faces the biggest hurdles

If you were to look no further than the headlines coming out of Africa of late, you would be forgiven for thinking that the continent was by now bristling with large solar power plants. The past two or three years have seen a glut of news stories proclaiming the imminent deployment of hundreds of megawatts of grid-tied solar across the continent as foreign investors flock to its fertile new markets.

The reality on the ground is quite different, however. Leaving aside South Africa, whose independent power producer (IPP) programme for renewables is frequently held up as a model for the rest of the continent (even if for the time being it is mired in legal wranglings), the number of utility solar plants built and operational in Sub-Saharan Africa can be counted on the fingers of one hand. In terms of PV-generated electrons on the grid, the widely proclaimed solar revolution in Africa for

now remains agonisingly out of reach, with governments still putting up barriers to investment and investors consequently struggling to finance and realise projects.

"There's a whole raft of difficulties that arise in terms of getting a fair allocation of risk in order to be able to put together a project financing," says Peter Hutchinson, executive director of Green Africa Power, a UK-based donor-funded investor in renewables in Sub-Saharan Africa. "The problem is you've got the underlying complexity... within particular countries, where in a lot of cases governments are sceptical about private sector involvement and ownership, and don't trust incoming investors not to rip them off."

That in a nutshell is the ongoing problem for utility solar in Africa: no lack of opportunity, no shortage of investor interest and no lack of the necessary know-how to actually build and operate

Rwanda's 8.5MW grid-tied PV project was completed in 2015, the region's first outside South Africa

projects – but a whole range of political, regulatory and institutional barriers which together mean that for now although projects may be easy to conceive they are much harder to execute.

Pathfinder projects

Nevertheless, there are plenty of reasons for optimism, and indeed some notable bright spots that point to an imminent sea-change in the trajectory of utility PV in the region. For starters, the fact that plants are beginning to be built at all in countries outside of the widely lauded South Africa is in itself highly significant. Beyond South Africa, four other countries – Ghana, Rwanda, Uganda and Senegal – have now joined the large-scale solar club and now boast their first multi-megawatt grid-tied PV power plants (see box).

Another cause for optimism is that there is a second wave of projects coming

up behind these trailblazers that look likely to reach financial close imminently. Some of these have the backing of serious international players, and there are high hopes within the industry that successful closure and completion of these projects will help kill off once and for all any lingering doubts that large-scale solar is a viable option in Sub-Saharan Africa.

Some of these projects are very much in the mould of their forebears, in so far as they are being driven by relatively small, agile developers that are more willing to take the risks associated with going into new markets and pursuing projects that don't necessarily fall within any formal renewables procurement programme. Most of the utility PV projects built outside South Africa to date could be said to fall into this category, and it looks likely that many of the projects currently in the development pipeline will follow that model – of one-offs.

A good example of this is the 100MW Nova Scotia project in Nigeria being taken forward by the Norwegian IPP Scatec Solar. Scatec has been one of the stand-out players so far in Sub-Saharan Africa's early utility PV adventures. The company is behind three operational PV plants in South Africa procured under the country's IPP programme. It was also responsible for the 8.5MW project in Rwanda completed two years ago. It has a number of other projects under development across Sub-Saharan Africa – in Mali, Mozambique, Burkina Faso, Senegal and Nigeria.

Nova Scotia is one of the company's more mature African projects, having secured the backing of the infrastructure investment fund, Africa50, at the end of 2016 and with a PPA in place. The company's chief financial officer Mikkel Tørud explains how in new markets such as Nigeria, a key aspect of Scatec Solar's role as a pioneer IPP is in educating local stakeholders.

"It's of course of vital importance that governments understand what is needed in terms of contract structures, PPAs and government guarantees backing the programmes to make them bankable," he says. "I think we see that maturing in terms of understanding of that. We are of course trying to be active in advising governments. It's a responsibility for all stakeholders to provide sound advice and also to ensure there are realistic expectations of what can be put in place."

Indeed, the educational role played by Scatec and other first movers in Africa's

emerging solar markets is likely to have a significant impact on how those markets will develop. Tørud says that by educating stakeholders, managing expectations and showing what is possible, Scatec is helping prove the concept of solar so that further projects and programmes can follow.

"It's important to demonstrate the viability of some of these projects now and get them off the ground," he says. "And I think governments see that that is required before they launch larger programmes and invite the broader set of investors in. There's always a discussion on when to go for tenders, for instance, and that is typically the second wave for some of these countries; to get into that they have to prove the concept first and we like to be part of that, but it's not for everyone."

Scaling Solar

Another important effort helping prepare the ground for large-scale solar in Sub-Saharan Africa is taking place under the banner of the Scaling Solar programme. This was launched two years ago by the World Bank Group's International Finance Corporation (IFC) with the stated aim of unlocking private sector investment in utility PV.

Speaking to *PV Tech Power*, Yasser Charafi, principal investment officer at the IFC and the architect of the Scaling Solar programme, explains the rationale behind the programme: "We were seeing strong interest from financiers to invest in solar PV in Africa. Yet, outside of South Africa and a couple of places in North Africa, we

were not seeing much uptake and growth in the PV market. We started wondering how to resolve that – and we quickly zoomed in on a couple of factors which seemed to us quite credible.

"One is the perceived risk of investing in Africa. And we were also hearing quite a lot about the lack of certainty around procurement processes, and people spending a lot of time and energy into developing projects but without any certainty on outcome. So when we put all of this together, what we thought is if we can come up with some way of resolving these issues we could perhaps help create a bigger market for solar PV in Sub-Saharan Africa."

Scaling Solar seeks to address these issues through three main activities: advice on procurement processes and documentation such as contracts; risk mitigation through a partial risk guarantee from the World Bank; and a general offer to finance projects that have bankable PPAs in place.

In the two years since Scaling Solar launched, four countries – Zambia, Senegal, Madagascar and Ethiopia – have signed up to the programme, and towards the end of 2016 it scored its first major success when a PV tender in Zambia that the IFC had advised on achieved a record low price of just over 6c per kilowatt-hour. The tender was also notable for attracting some heavyweight bidders – among them France's Neoen in partnership with US giant First Solar, which together won a 47MW (AC) project and Italian utility Enel, which won 28MW.

This low price, achieved in a part of the

Xiaocheng Technology's 20MW PV plant in Ghana is one of only a few operational utility solar plants in Sub-Saharan Africa



Credit: Tom Kenning

world with no track record of large-scale solar, has since raised a few eyebrows. During a recent panel debate at a solar finance conference organised by *PV Tech Power* publisher Solar Media, participants questioned whether it was feasible to deliver projects at such a low price in a country where the bankability of solar has not yet been proven.

Charafi acknowledges the surprise the tender provoked, but says that when put in context it does not seem so out of place. "We know what the prices were in South Africa for round four [of its procurement programme], and for a number of other recent auctions, be it in Peru, Mexico, Morocco, GCC and other emerging markets," he says. "So taking the broader picture, if you put the Zambia prices in perspective, they seem to us more of a continuation of global prices in decline. The prices [in Zambia] were low but not outliers."

At the time of writing, the Zambia projects were moving forward with Neoen saying it expects to achieve financial close in the spring. Meanwhile, coming up behind Zambia in the Scaling Solar

programme is Senegal, where a 200MW tender programme is being planned. Charafi says he expects the Senegalese authorities to put out a request for proposals for the tender within weeks. The other two countries where Scaling Solar is currently active, Madagascar and Ethiopia, are a little further behind, with projects being scoped out, but again Charafi says he expects movement on both programmes in 2017.

Ultimately, Charafi's hope for Scaling Solar is that it helps utility PV in Sub-Saharan Africa generate sufficient momentum to start sweeping away some of the lingering institutional barriers and indeed prejudices that have so far stopped it from fully taking root. "One of the things I care about personally is beating back on the scepticism towards solar PV," he says. "Some people still think that PV is an outlier technology, something that is not baseload, not dispatchable, is too expensive... So if we can only prove that PV has a role to play in the energy mix of any country, it has great potential particularly if on the storage side things continue on the path we're

seeing, that prices are not the prices of the early 2000s, we have PV that in some case is the most competitive generation technology full-stop compared to any other alternative in Sub-Saharan Africa... If we can achieve that and if people start doing it by themselves, that really is our mission."

To be sure, though, getting to that place is still going to require a concerted effort. As GAP's Peter Hutchinson points out, the low number of financed or completed projects in the region is a clear indication that "none of them is easy".

One significant issue for Hutchinson is that, in his view, the size of projects being pursued in Sub-Saharan African countries is in many cases too large. Not only is this potentially problematic in terms of the stability of national grids – which in many cases are quite weak in African countries – but can also be a headache from a financing perspective. "The larger a project becomes, the more interested parties have to be involved in the financing," Hutchinson explains. "And when you start adding more players into the mix the complexity becomes ever more pronounced and that just slows the whole process down."

Nevertheless, there are signs that the critical mass described by Charafi is beginning to build. Beyond the four countries already signed up to Scaling Solar, he says the IFC is in advanced discussions with several more and has had some kind of dialogue with "a good third of countries in Africa". Not only that, but countries beyond Africa – in Asia and Central America – have made inquiries about the programme and what something similar could achieve in their part of the world.

"I don't know of any country at the moment that is not seriously looking at options for solar PV right now," Charafi says. This is partly a consequence of the Zambia tender, which has "made a lot of people sit up and take notice".

"It's a very different thing if people can hope for prices between 6 and 10 cents or if they're looking at 15 cents and above," he says. "It changes the nature of the discussion."

The opportunities for solar and other renewables will be under discussion at Solar Media's Clean Energy Summit: Africa event on 4-5 April 2017 in Accra, Ghana. Further details are available at africa.solarenergyevents.com

The financing conundrum

Completed at the end of 2016, Senergy 2 is a 20MW grid-connected PV power plant located in northern Senegal. It will play an important part in Senegal's energy mix, providing power for up to 160,000 homes.

In many ways Senergy 2 is illustrative of the precarious nature of the solar IPP business in Sub-Saharan Africa, particularly where finance is concerned. The French developer behind the project, Greenwish, was left facing the prospect of having to shelve the project after a financing deal with the African Development Bank (AfDB) fell through.

Fortunately, with backing from UK and Norwegian donor money, Green Africa Power was able to step in and offer Greenwish bridging finance that allowed it to build the project and gave it some breathing space to find a long-term financial backer.

"We came to conclusion that the best solution was that we stepped into the role of the AfDB but only on a short-term, bridging-finance basis," says GAP's Peter Hutchinson. "We would loan 75% of project value and they would refinance us through proper long-term senior debt when they'd had more time to arrange it and when the construction risks had gone. The senior debt provider then only had to look at off-taker risk and political risk, not construction [risk]."

It was a neat solution to a problem that the relatively low number of projects that have actually reached financial close in Sub-Saharan Africa underlines: financing utility PV in Africa remains a tough game.

For Hutchinson, that fact raises questions over the extent to which traditional utility-scale PV projects can be built fast enough to play a key role in Africa's rapidly ballooning demand for power.

"At which point one starts to think a little bit about, well, how did electricity become readily available in Western Europe," Hutchinson says. "And in almost all western countries I'm aware of they all started with localised mini-grids, and the national grid came much later in development. Maybe the answer for Africa is going to be to use the same path and not to go down grid-scale production, but to go for mini-grids. That again would play to the idea of smaller projects being easier to get off ground. That may end up being a way forward which can go alongside the big grid projects – a combination of the two which forms part of overall solutions."



Credit: Green Africa Power

Senergy 2 came online in 2016, becoming Senegal's first utility PV power plant