

Project briefing

SOUTH AFRICA'S LARGEST PV PROJECT SPRINGS INTO OPERATION

Project name: Sirius and Dyason's Klip 1 and 2 (also known as the Upington solar complex)

Location: Upington, South Africa

Capacity: 258MW in total (spread between three 86MW projects)

On 10 April 2020, South Africa's biggest solar PV complex to date sprang into operation as the final phase was completed. The timing was extremely fortunate, just a day ahead of the country's government announcing a nationwide lockdown as the COVID-19 pandemic continued to spread worldwide.

The company behind the 258MW operation, Norway-based Scatec Solar, has had a presence in South Africa for the past decade, and the three-phased complex in Upington is its fourth project. South Africa has procured 1.5GW of solar power generation since the government introduced the Renewable Energy Independent Power Procurement Programme (REIPPPP) in 2011. Scatec Solar has won contracts for solar projects in the first, second and fourth round of the programme.

It signed power purchase agreements

for the 258MW projects in Upington, in the Northern Cape, on 5 April 2018.

The company has been the engineering, procurement and construction provider for the projects, and will provide operation and maintenance, as well as asset management services to the power plants.

The completion of the Upington projects brings Scatec Solar's total operational capacity in South Africa to 448MW, making it the leading player in the solar sector in the country. The project increased the company's asset base by 60%.

The government designed the programme very carefully to avoid problems that had been experienced in other countries, explains Jaco Uys, senior project manager at Scatec Solar. "There are a lot of legal documents to make sure that the framework for all the parties is very well defined. That provided overseas investors with enough comfort to come into the country and invest, and Scatec Solar was one of those.

"The REIPPPP is a fairly onerous process, but it's been successful to a large degree because of that. All projects have to meet strict conditions on employing local people, using equipment built domesti-

cally, labour rights and environmental issues," Uys says.

Employment and environmental protection

Projects must have environmental authorisation before they are allowed into the bid programme, he says. Authorisation covers flora, fauna and water use issues. Both the owner of the site and the builder employ their own officers to ensure that environmental conditions are met. The environmental compliance officer (ECO) reports to the environmental site agent (ESA), employed by the owner.

Considering the arid nature of the project's location, water use was the biggest environmental concern for the Upington project, Uys explains, and the company installed a water meter which was regularly monitored by the ECO to ensure it did not exceed the amount of water permitted under its licence. It also had to construct a type of culvert bridge as one of the access roads to the site crossed a minor watercourse.

The project site is in a semi-desert area, and did not involve major earthworks or disturbance, so there were no particular issues with wildlife, Uys says. There was potential for snakes and scorpions to be found on site, so Scatec Solar trained a couple of site staff as snake handlers to catch any snakes and release them on adjacent properties. This happened "a couple of times", Uys says. A bat-eared fox den was also found on the land portion, and construction ceased in the area to allow the animals freedom of movement.

In terms of complying with local employment obligations, Scatec Solar was easily able to recruit all the labour it needed from the local area, Uys says. "Constructions of these facilities always require a large amount of labour and it was therefore relatively easy for the project to achieve the numbers committed to," he says.

"It was also extremely important for the project to ensure that actual economic development objectives figures met or exceeded the tender numbers committed to, as these





By Catherine Early

numbers are audited by the Department of Mineral Resources and Energy, as well as the Independent Power Producer (IPP) Office. If they are not achieved, it leads either to significant penalties, or in the case of repeated transgressions, possible termination,” Uys explains.

The company worked with local representatives to create a local community forum to ensure a consistent, clear and fair process of engagement with local people, Uys says. The company will have a 20-year relationship with the community, and so wanted to create an avenue to resolve disputes, he explains.

“It was quite difficult to get the forum established; it took a while to get buy-in from the community. But the moment that it was established things became a lot easier, so for us, that was a lesson learned and, in the future, we will do the same thing,” he says.

The company is committing to operate in line with the Equator Principles and the IFC’s Environmental and Social Performance Standards to ensure consistent practices across all projects.

“The focus of our socio-economic and environmental programmes and development mainly includes access to energy, capacity building, health and education. Over the entire lifetime of the project, a percentage of quarterly revenue is dedicated to development for all our solar plant. This work is supported by local community liaison officers, who are on-the-ground resources for the company,” Uys adds.



Credit: Scatec Solar

Deal structure

Financial close for the three projects in Upington was reached in April 2018, and involved a total investment of ZAR4.76 billion. A consortium of commercial banks and development finance institutions led by South Africa’s biggest lender, Standard Bank, are providing non-recourse project finance to the solar farm of ZAR3.68 billion, accounting for 77% of the total project cost.

Scatec Solar owns 42% of the project, Norfund holds 18%, the surrounding Community of Upington has five per cent, and H1 Holdings, a South African Black investor, holds the remaining 35% of the equity.

Investors were attracted to the project by the company’s track record in the country; good weather and irradiation in the Northern Cape, and around Upington in particular; and community impact, since the project was judged to have potential for a meaningful impact on an under-resourced community, according to Mohamed Khalpe, Scatec Solar’s asset manager.

Other factors that won over investors

included the company’s insight into the permitting process, making it more efficient; and the logistical benefits of the site such as being close to a relatively big town, roads, infrastructure and an airport one hour’s flight away from the major cities of Cape Town and Johannesburg.

Desert construction

The semi-desert location of the site did not pose any particular issues in terms of what equipment needed to be specified for the project, Uys says. “It isn’t full desert, so sand is not a problem. The major issue there is the heat, it can reach 50°C in summer, and PV modules can be less efficient under those conditions. However, the irradiance is unbelievably high and the plant is actually performing better than expected,” Uys says.

The three projects at Upington use standard mono-perc 375Wp modules. Single-axis trackers are used – though trackers are more expensive, the additional yield of up to 30% more than offsets the extra cost, Uys says.

Another challenge caused by the semi-desert conditions is that the ground



Credit: Scatec Solar



Credit: Scatec Solar

is very hard, meaning that the holes in which to fix the trackers need to be drilled in advance. In Europe, pre-drilling is rarely needed, as the ground tends to be softer, Uys says. Each of the three projects at Upington needed 22,000 holes to be pre-drilled, he says. Trenches for the cable also needed to be cut with a machine instead of hand-dug, he adds.

The three phases of the project were built concurrently. Work on the access roads began in August 2018, and notice to proceed was obtained for all three plants in December 2018. The first 86MW phase was grid connected in February 2020, with the second phase following shortly afterwards and ahead of schedule. The final plant achieved commercial operation on 10 April.

The team was very fortunate that the build-out was not affected by the outbreak of COVID-19 and the nationwide lockdown, Uys says. "The very last test we had to do for the last project was the day before lockdown started. We did the test, and after that all the site crew went straight home.

"The plant was operational after that, and as power generation is classified as an essential service, the operations and maintenance team could continue working. So the impact of COVID-19 was

minimal, and that was pure luck," he says.

Ongoing operations and maintenance will be handled from Scatec Solar's global control and monitoring centre in Cape Town, which keeps track of all its plants worldwide 24-7. Though there has yet to be a confirmed case of COVID-19 in the remote Upington area, the firm has developed a contingency plan for using back-up teams from other solar plants in the country, and has divided local teams to reduce the risk of a local outbreak affecting the whole team.

Positive future

The outlook for solar energy in South Africa is now looking "very positive", Uys says. Though there was a delay in between the third and fourth rounds of the REIPPPP, the fifth round is expected to be announced imminently.

The government hopes to increase the 1.5GW of existing solar capacity to more than 8GW by 2030. The Integrated Resources Plan 2019, published by the Department of Mineral Resources and Energy in October last year, outlines plans for 1GW of solar to be allocated each year in 2023, 2025 and 2028-30. It has been praised by the South African Photovoltaic Industry Association for giving a "moderate level of certainty" to the sector.

Future prospects for the solar market

have been further boosted by recent government moves to relax regulations around power generation to prevent blackouts, Uys says. Mines and municipalities are now permitted to appoint an independent power producer (IPP) to generate electricity for them, rather than buying only through state-owned utility Eskom, which previously held the monopoly on both generation and distribution.

In addition, IPPs with projects generating under 10MW will have an easier application process and a greater chance of it being approved. These regulatory changes have increased the potential for solar generation, Uys says. "There's a lot more opportunities to build more solar, we're already seeing a lot more enquiries in the market. It's definitely looking up," he adds.

In an attempt to serve this market, Scatec Solar has introduced Release, a fully scalable solar power and battery solution that it says will reduce electricity costs and increases energy independence.

Scatec Solar is holding its cards close to its chest for how much it is hoping to bid for in the round five auctions. "All developers and players in the market have various projects lined up, so we're looking forward to that. Everyone will put their bids in and we'll see what happens," Uys says. ■