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Australia RE facility shows potential for off-grid mining in Africa

The off-grid solar and battery storage facility successfully commissioned at the DeGrussa copper and gold mine in Western Australia could pioneer the way in Africa for off-grid mining.

South Africa's juwi Renewable Energies has been tracking the performance of the Australian installation very carefully and believes there is enormous potential to apply the hybrid solution in Africa, as juwi South Africa MD Greg Austin explains: "Solar/diesel hybrid systems are currently considered state-of-the-art for micro-grids and off–grid applications, delivering the lowest overall cost of power while guaranteeing power availability around the clock, at the same time reducing the fuel bill by around 25%. That's a massive saving and a competitive advantage," said Austin.



The innovative \$40m project, designed and implemented by the juwi Australia local entity is the largest integrated off-grid solar array in Australia, and has established DeGrussa as an industry leader in the use of renewable power for mining and processing operations.

Cutting-edge technology

According to Austin the solar/diesel hybrid solution is a first step toward a 100% solar solution with battery backup: "There are less than 100 projects globally that combine the solar/diesel solution, but in mining there are less than 10, so this is cutting-edge technology."

"DeGrussa has leveraged juwi's technical leadership and global partnerships to deliver one of the world's leading solar PV / energy storage projects yet designed and constructed," said Austin.

"This pioneering project on the other side of the globe will bring learning, technical development and project experience to off-grid mining and industrial customers in mineral-rich Africa.

"With 120MW of solar PV under it's African belt, juwi looks to stabilise energy supplies at a reduced cost. We'll be in Lusaka at ZIMEC 2016 this June and look forward to presenting the learnings and competencies from DeGrussa at this forum," he added.

Solar hybrid system

For Sandfire Resources NL, a mid-tier Australian mining company, the juwi Group developed the 10.6MW solar hybrid system to fully integrate with the existing 19MW diesel-fired power station at the DeGrussa Mine. Single axis tracking and a 6MW battery maximise the use of solar power to provide the majority of daytime electricity while reducing the mine's total diesel consumption by approximately 25%.

The DeGrussa mine has achieved full generation capacity after successfully attaining key milestones during commissioning. The facility is currently generating approximately 7MW of power, which is in line with expectations given the time of year.



Commissioning of the project commenced in mid-March following installation of the last of the 34,080 solar photovoltaic (PV) panels. The solar array covers a total area of over 20ha at the site, which is located immediately adjacent to the DeGrussa underground mine and processing plant. The DeGrussa mine is very remote, located 900km north of Perth, Australia and 150km from the nearest town Meekatharra - population of 800 people.

The project's 34,080 solar PV panels are attached to a single-axis tracking system mounted on 4,700 steel posts. This tracking system enables the panels to track the sun during the day, improving the plant's overall production by 20%.

The panels are connected via an extensive network of low-voltage, high-voltage and communication cables to a 6MW lithium-ion battery storage facility and the existing 19MW diesel-fired power station at DeGrussa.

The DeGrussa Solar Power Project is owned by French renewable energy firm Neoen with juwi Renewable Energy responsible for the project development, EPC and O&M. The plant was constructed by national surveying and infrastructure construction company OTOC Limited, with project financing provided by the Clean Energy Finance Corporation (CEFC) and recoupable grant funding support from the Australian Renewable Energy Agency (ARENA).

The solar facility has been integrated with the diesel-fired power station – owned and operated by Pacific Energy subsidiary KPS – continuing to provide base-load power to the DeGrussa mine with sufficient minimum load to ensure it can respond quickly to meet the power requirements of the process plant and underground mine.

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