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Solving South Africa's energy crisis: renewable energy projects offer new hope

South Africa's electricity network requires considerable reform over the coming decades if the country is to successfully diversify its generation mix to sources other than coal to meet the increasing demand for power. This view is supported by The Department of Energy's Integrated Resource Plan (IRP) 2010–2030 which anticipates the introduction of 56 539 MW of new generation across various technologies and geographies over the coming 20 years.

In December 2012, 28 renewable energy projects received the impetus they had been waiting for when government signed power purchase, implementation and direct agreements that will enable wind and solar projects identified as preferred bidders under South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) in December 2011 to move to financial closure. These projects total an installed capacity of 1415 MW at an approximate investment of R47 billion, with several installations expected to commence commercial operation in 2014.

As a market leader in renewable energy and a trusted advisor for infrastructure engineering, Aurecon is playing a leading role in ensuring the successful realisation of six of these projects totalling more than 400MW in the capacity of Owner's Engineer (OE) and Balance of Plant Design Engineer. "Aurecon understands the business case for sustainable energy, and we are excited about the role we are playing in shaping South Africa's energy future," comments Blair Walter, Aurecon's Renewable Energy Competency Leader.

Aurecon Renewable Energy Services Leader for Africa, Paul Nel, adds that there are significant challenges facing the building of all of these renewable projects. "There is often a lack of local experience pertaining to these kinds of projects, and what's more, they all involve technology new to the South African market." Walters agrees, explaining that "The need for an experienced consultant to apply best-in-industry experience to overcome these challenges is key to achieving successful outcomes."

A snapshot of these six projects, three of which are wind farms and three solar installations, appears below:

Delivering world class renewable energy assets

- Cookhouse Wind Energy Facility

The Cookhouse Wind Energy Facility in the Eastern Cape was the largest project awarded preferred bidder status during the first bidding window of the SA REIPPPP. It will have an installed capacity of 138.6 MW, powered by 66 Suzlon S88 2.1 MW wind turbines and is expected to be one of the first projects to commence construction within the South African REIPPPP framework; starting in November 2012, with commercial operations planned for June 2014.

Aurecon has acted as Owner's Engineer on the Cookhouse Wind Farm project since early 2009, providing a wide range of technical advisory services to help progress the project through feasibility and financing phases, including the layout design of the wind farm, wind resource and energy yield assessments and technical advisory services. "We've

subsequently been appointed by Renewables Cookhouse Wind Farm (Pty) Ltd to serve as Owner's Engineer on this project for the construction phase, essentially fulfilling a very vital quality assurance function which includes contract management and administration, close management of project budgets, cash flows and timelines and monitoring site progress," comments Walters . He adds that the project is widely recognised as the leading wind farm project in South Africa and will look to deliver a world class renewable energy asset.

- Hopefield Wind Farm

The second wind farm, Hopefield Wind Farm, is located on 2200 hectares of farmland near the town of Hopefield in the Western Cape. It will have an installed capacity of 67 MW with a total project value of approximately R1.5 billion. Vestas V100 1.8MW turbines will be used to meet the 67 MW capacity and will secure an annual yield of approximately 190 GWh. The farm is expected to take 14 months to construct, starting in early 2013, while the contract has been structured by developer Umoya Energy (Pty) Ltd in such a way that community development and upliftment are achieved through local contract employment and a host of other related community projects.

Aurecon has been appointed by Vestas to provide support for the project in terms of site supervision to ensure high technical quality of the Balance of Plant (BoP) constructed on site. Aurecon will also be providing health and safety, including compiling an Occupational Health and Safety plan in accordance with client specifications and providing a fulltime Health and Safety officer on site.

- Dassiesklip Wind Farm

A third wind farm, Dassiesklip Wind Farm, located close to Caledon in the Western Cape, will utilise a leased area of approximately 602 hectares. The development will be comprised of nine 3 MW Sinovel turbines, with a total installed capacity of 27 MW. The project will make use of an existing 66kV line between Houwhoek and Caledon and a new substation with 66kV feeder bays will be constructed on the site boundary to evacuate the power generated by the wind farm.

Aurecon has been appointed by Iberdrola / Group Five to provide support in terms of detailed engineering design for a number of the balance of plant systems, including geotechnical services, turbine foundations and electrical reticulation.

Likewise, two large solar installation projects will also receive significant support from the group.

- Letsatsi and Lesedi PV Installations

The Letsatsi and Lesedi PV Installations each represent an installed capacity of 64 MW. The Letsatsi installation will take place at Soutdrift, near Bloemfontein in the Free State, while Lesedi is located at Humansrus, near Kimberley in the Northern Cape. Construction of both installations will commence in early 2013.

Aurecon will support these projects by way of providing design review to ensure compliance with local regulations, as well as construction supervision and environmental monitoring, amongst others.

- Kathu Solar Energy Facility

The third solar project, Kathu Solar Energy Facility, will be located approximately 16km north-west of Kathu in the Northern Cape Province and is expected to have an installed capacity of 100 MW. Kathu is a well-positioned mining town in an area rich in iron ore deposits and has a strong infrastructure network. It is envisaged that the project will be rolled-out in two phases, the first with a capacity of 75MW and the second 25MW, both with expected project lifecycles of 20 years.

Building Energy has appointed Aurecon to fulfil the role of Owner's Engineer on the project, including ensuring all-important technical compliance on all civil, electrical and construction issues, and assisting with the resolution of technical queries and disputes.

"Renewable energy is experiencing a period of strong growth as countries move to reduce their greenhouse gas emissions. We are very proud of the work we are doing with our clients on projects to reduce greenhouse gas emissions and provide community access to renewable energy."

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About Aurecon

Aurecon provides engineering, management and specialist technical services for government and private sector clients globally. The group has been involved in projects in more than 80 countries across Africa, Asia Pacific and the Middle East.

Aurecon employs over 7 500 professionals who offer in-depth local market knowledge combined with international expertise across eleven key market sectors:

- Construction
- Data & Telecommunications
- Defence
- Energy
- Government
- International Development Assistance
- Manufacturing
- Property
- Resources
- Transport
- Water

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