

Winds of Change In South Africa

by Clint Steyn, in Dubai

In 1960 Harold Macmillan made his famous “Winds of Change” speech that was a watershed moment in South African politics and that signaled a seismic shift in attitudes. Today, winds of change of a different sort are blowing in the energy sector in South Africa, with the sector poised to make a significant shift away from an overwhelming reliance on fossil fuels to renewable energy.

Security of electricity supply in South Africa is highly precarious. South Africa’s electricity demand has substantially increased since 1994. However, no new power stations were built leading to a decline in reserve margins. In 2008, South Africa endured significant load shedding and rolling black outs. Eskom, South Africa’s state-owned utility, says power supply to South Africa will remain tight, with the risk of black-outs “significantly” increasing from 2011 to 2013, and then again from 2018 to 2024.

Eskom has indicated that the country needs to add 50,000 megawatts of new generating capacity by 2028. South Africa’s current generating capacity of approximately 40,000 megawatts is predominantly made up of coal, which accounts for about 90% of all domestic generation. Virtually no renewable generation exists currently.

It is a government aspiration that renewables will account for a significant proportion of new capacity.

The year 2011 looks set to be a breakthrough year for the renewable energy sector in South Africa.

On August 3, 2011, the Department of Energy launched the first-ever procurement process for renewable energy in South Africa. Under the first round of this program, South Africa will try to procure 3,725 megawatts of capacity by 2016.

The launch of the renewable procurement program followed from the issuance in March of a long-awaited integrated resource plan that featured a substantial and ambitious increase in renewable energy targets, up from 30% of new-build generation to 42%.

The run up to the launch of the renewable program was not without a few twists and turns along the way. But before we consider in detail the current state of play of the renew-

able procurement program in South Africa, let’s go back to the beginning.

Rich Renewable Resources

As with its coal resources, South Africa is blessed with an abundance of solar and wind resources.

Wind: Africa’s wind resource is best around the coasts and in the eastern highlands. It is in Mediterranean North Africa that wind power has been developed at scale, with further significant growth expected. At the end of 2009, about 96% of the continent’s total wind installations of 763 megawatts were to be found in Egypt (430 megawatts), Morocco (253 megawatts) and Tunisia (54 megawatts).

Yet, despite the wealth of wind resources in Africa, under the International Energy Agency’s reference scenario, only 200 megawatts of new wind capacity would be added every year until 2020. This would increase to 500 megawatts by 2030, leading to 3,000 megawatts of wind power installed in the entire African continent by 2020 and 8,000 megawatts by 2030.

In the case of South Africa, many local commentators are more optimistic, taking into account government targets and policy measures and the fact that the country is ideally suited for wind power development given its abundant wind resources, ample suitable sites and modern high-voltage electrical infrastructure.

Indeed, recent comprehensive wind mapping in South Africa has illustrated proven wind potential within the country, mostly in the coastal areas.

The South Africa Wind Energy Association estimates that with the right policy framework, wind power could provide as much as 20% of the country’s energy demand by 2025, translating into 30,000 megawatts of installed wind capacity.

Solar: Every day the sun produces 100,000 billion tons of oil equivalent, while in 1998, the annual global consumption of energy was 9.8 billion tons of oil equivalent.

Both sub-Saharan and Saharan Africa have excellent solar irradiation levels suitable for efficient / continued page 2

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electricity generation, with South Africa having some of the best solar irradiation levels in Africa.

The annual 24-hour global solar radiation average is about 220 W/m² for South Africa, compared with about 150 W/m² for parts of the United States and about 100 W/m² for Europe and the United Kingdom. This makes South Africa's local resource one of the highest in the world.

Specifically, the Northern Cape has excellent potential for solar power, encompassing concentrated solar power and photovoltaic technologies, with other provinces (like the Free State) also having high potential.

Ready to Take Advantage

Last year was a challenging year for the global wind industry, which saw a global decline in annual installations for the first time in almost 20 years. Structural overcapacity has led to a decline in turbine prices with Bloomberg's recently published Wind Turbine Price Index showing recently signed contracts for 2011 delivery carried a 7% discount on 2009 prices (19% discount on 2007 to 2008 prices).

Global wind power markets have been for the past several years dominated by three major markets: Europe, North America and Asia (China and India). These three markets accounted for 86% of total installed capacity at the end of 2009.

There are signs that things are changing, with emerging markets in Latin America, Asia and Africa reaching critical mass. With emerging markets like South Africa ready to start challenging these main markets in the coming years, the downward pressure on wind turbines due to market overcapacity and increased competition may result in suppliers and developers casting their eyes more intensely at these emerging markets.

It came as no surprise then that the Department of Energy received some 384 responses to a request for information for renewable energy projects issued in September 2010.

Promoting renewable energy technology in South Africa currently requires financial incentives, due to the cheaper and more reliable fossil fuel sources, but many believe that renewable energy will soon not be a more expensive option.

"The difference between the cost of new thermal generation and wind is less than you expect," says Paul Eardley Taylor, head of energy, utilities and infrastructure at Standard Bank. At the beginning of May, Eskom disclosed to Parliament that the current assumed tariff from 2015 onwards is R1.09 per kWh. The wind tariff is R1.15 per kWh, so even without carbon

taxes there is not really a significant gap. Given the scale of Eskom's tariff increases, the gap between wholesale tariffs and on-shore wind keeps narrowing. "Solar is also cheaper than diesel," says Eardley Taylor.

Refit Program

With an abundance of solar and wind resources, South Africa, like many emerging markets, has adopted a feed-in tariff mechanism to promote renewable energy.

The South African government published a white paper on renewable energy in 2003, which set a modest initial target for renewable energy of approximately 4% of total generation by 2013. However the renewable energy feed-in tariff or "Refit" program was only officially announced in 2009 as part of the Department of Energy's integrated resource plan.

The Refit program covered nine technologies: onshore wind, small hydro, landfill gas, biomass (solid), biogas, photovoltaic systems, concentrating photovoltaic (without storage), concentrating solar power or "CSP" trough (with or without storage) and CSP tower. South Africa is globally unusual in having three separate CSP tariffs while still not permitting lens and dish technology.

The National Energy Regulator of South Africa — called Nersa — published its Refit tariffs in 2009 for these technologies, including a tariff of R1.25 per kWh for wind and R3.94 per kWh for solar PV.

The Refit program was given a substantial boost by the issuance in March and promulgation in May 2011 of the long-awaited integrated resource plan called "IRP 2010." The IRP 2010 outlines the proposed power generation mix for South Africa for the period 2010 to 2030.

The most striking feature of the final, so-called "policy adjusted" IRP 2010 was the increase in the overall contribution of renewable energy to the generation mix, up from 11,400 megawatts in the draft plan to 17,800 megawatts, some 42% of targeted new generation. The IRP 2010 included a defined technology split of the renewables allocation, with wind and PV each contributing 8,400 megawatts and CSP contributing 1,000 megawatts. Nuclear is expected to contribute 23% and coal 15%.

Many commentators remarked that solar PV emerged as the big winner from this process with the target of 8,400 megawatts translating into the deployment of a "staggering" 300 megawatts of large-scale solar PV per year from 2012 onwards.

By 2030, coal is still likely though to / *continued page 3*

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represent some 50% of the total mix at around 41,000 megawatts. Under the plan, a total of approximately 56,000 megawatts of new capacity will be added over the next 20 years, raising the country's total capacity to some 89,000 megawatts by 2030. Of the new capacity, there is a total of about 42,000 megawatts that is yet to be committed, with the balance already being built by Eskom.

Under the IRP 2010, the first phase of 1,025 megawatts of renewable projects was intended to be completed by the end of 2013. The IRP 2010 also includes time frames for the phased development of projects over 20 years, with specific megawatt allocations in different years. It required 300 megawatts of solar PV per year from 2012 to 2024, further increased to 500 to 1000 megawatts per year until 2030, and 200 megawatts of solar CSP by 2015, with 100 megawatts per year through to 2025.

Uncertainty as Nersa Intervened

Following issuance of the IRP 2010, it had been anticipated that the procurement process for the first round of a relatively modest 1,025 megawatts of renewables projects would be quickly launched by the publication of the Refit request for proposals.

However, days after it was confirmed that the role of renewable energy in South Africa's generation mix would be substantially increased, Nersa issued a consultation paper proposing a material decrease in the Refit tariffs when compared to the previously agreed and promulgated 2009 tariffs, rather than commence with the procurement process.

The proposed reductions ranged from 7% on some technologies to 41% on others, including a 25% reduction in the tariff for wind from R1.25 per kWh to around R0.94 per kWh.

In its consultation paper at the time, Nersa said that the tariffs had been reduced based on 2011 market conditions, reflecting a reduction in the nominal cost of debt and inflation, and a strengthened Rand-to-US-dollar exchange rate, since the 2009 tariffs were set.

A senior Department of Energy official confirmed in mid-June that the government intended to pursue a competitive bidding process for South Africa's first wave of renewable energy projects under the Refit program.

Ompi Aphane, the deputy director-general for electricity, nuclear and clean energy, said, "We're definitely going to have price competition on the different technologies." His comments raised questions about the future of the Refit tariffs

adopted by Nersa two years ago.

There seemed to be some misalignment between the processes of Nersa and the government, with the government proposing that Refit prices, instead of applying across the board according to levels determined by Nersa, will serve as an upper guide in a competitive bidding process.

Aphane said the Refit rates would act as a "ceiling" beyond which bids would not be considered. To meet other objectives, such as localization, bidders would first be required to pass a set of minimum requirements. "Those that make the thresholds then go into the next comparison, which is price."

Reactions

Though there had been discussions in the sector about the possibility of a revision in Refit tariffs, particularly in light of improvements in technology pricing and as a result of a change in exchange rate assumptions used, Nersa's announcement came as a shock to the industry, in light of its timing a week or so before the procurement process was widely expected to commence.

Nersa's move appeared to surprise even the Department of Energy, which initially said that the higher tariffs should apply for the first round of Refit bids to go out to tender because their projects had to be ready by 2013 and would therefore cost more.

The proposed tariff changes and the mooted adoption of a competitive bidding model raised alarm in the sector, while the magnitude of tariff drops worried some technology segments.

South Africa Wind Energy Association board member Ian Macdonald has said that recent developments were "disappointing," particularly owing to the fact that, until April, the one constant in the much delayed renewables process had been the tariff. The 2009 Refit stimulated material investor interest. It is estimated that wind energy developers had already risked over ZAR 400 million developing projects to participate in the Refit program on the premise of the tariffs promulgated in 2009.

Many in the renewables sector have argued that the Refit model, which offers a guaranteed purchase price, had emerged as "best practice" globally for supporting the development of the fledgling renewables sector.

More than 60 countries had pursued the model and developers argued that it has delivered better results when compared with those countries that opted for competitive bidding. The key danger, they argued, is that

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inexperienced and overly-optimistic developers bid low in order to secure the tender, but are then unable to raise the project finance required to construct projects.

The wind trade association pointed to a detailed 2008 analysis by the European Commission that concluded that “well-adapted feed-in tariff regimes are generally the most efficient and effective support schemes for promoting renewable electricity.”

In contrast to most of the renewables developers, there were some developers, particularly in the solar sector, who supported the tariff reductions, with Olivier d’Huart of PV manufacturer Amonix saying that the revised solar tariffs were internationally competitive and that the 2009 tariffs were “over generous.”

Renewables Program Launched

The long-awaited procurement process for South Africa’s first renewable energy projects commenced on August 3, 2011 with the publication of the South African renewable energy IPP request for proposals.

The request for proposals seeks to procure 3,725 megawatts of renewable generation by 2016 in the first round of procurement. This is a significant increase from the 1,025 megawatts of capacity that market commentators had been expecting.

There is a defined allocation between various renewable technologies, and the request for proposals sets a tariff cap for each technology. A bid will be considered non-compliant and be automatically rejected if the price cap is exceeded. The table below summarizes this allocation as well as the relevant tariff caps.

Technology	Allocation (megawatts)	Tariff cap (R/kWh)
Wind	1,850	1.15
Solar PV	1,450	2.85
CSP	200	2.85
Biomass	12.5	1.07
Biogas	12.5	0.8
Landfill gas	25	0.6
Small hydro (less than 10 MWs)	75	1.03
Small projects (1-5 MWs)	100	As above

A key feature is the significant increase in allocation of capacity to solar PV.

The evaluation criteria in the request for proposals contemplate a two-step tender process. Projects will first compete on a number of “qualification” criteria and gatekeeper issues such as status of land rights, environmental permitting and various technological and financing criteria.

Those projects that get through the first round will then move to round two where they will compete against each other on certain stipulated evaluation criteria. The two main criteria are price and economic development.

Each technology has its own economic development matrix, but common to all are questions of job creation, local content (with special emphasis on local manufacturing), rural community development, skills development and education, enterprise development, socio-economic development and participation by the historically disadvantaged. The points allocation between price and economic development is 70/30.

There are five bidding “windows” — November 4, 2011, March 5, 2012, August 20, 2012, March 4, 2013 and August 13, 2013. If the maximum allocable megawatts for any particular technology have been allocated during any particular window, then the subsequent windows will not be opened for that technology.

The request for proposals includes a drafts of a power purchase agreement, implementation agreement, direct agreement and connection agreement. Unusually these agreements are non-negotiable and no bidder mark ups will be allowed.

Bidders whose responses rank the highest will be appointed preferred bidders, with as many being appointed as may be necessary in order to provide the maximum allocation of megawatts for each technology. These bidders would then need to conclude a power purchase agreement with Eskom, finalize connection agreements and sign an implementation agreement with the Department of Energy. Projects bidding in the first window are expected to reach financial close by June next year.

Eskom has been specifically excluded from bidding any of its renewables projects, and the state-owned utility’s role has been confined to that of buyer and to connecting the projects to its grid.

Market Response

Market reaction has generally been positive. “We’re impressed with the request for proposals,” said Standard Bank’s Eardley-Taylor. “Although it has been along

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time coming, it is a solid eight out of 10.”

Potential developers have indicated that the tariff caps did not appear to be unrealistic, but some were concerned about the number of requirements being added that were unrelated to the core business of power generation.

The Department of Energy has confirmed that more than 400 companies paid the R15,000 application fee to receive the bid documents, although about 270 of those could be considered to be potential IPP developers with the balance being made up of potential financiers and equipment suppliers.

The government is understood to be very pleased with the response, particularly against the backdrop of the initial disquiet expressed by potential developers when it was confirmed that the renewable energy feed-in tariffs had been abandoned in favor of a competitive bidding process.

Director General Nelisiwe Magubane said the response had been “better than expected” and that further applications were likely from foreign and domestic companies. She added that the response also bodes well for delivery on the objective of building a “sustainable” renewables industry, which could lead to development of some 18,000 megawatts of renewable energy by 2030.

It has taken a while and there have been twists and turns along the way, but the renewables program in South Africa is up and running.

With the first round of the procurement process expected to generate between \$10 billion and \$12 billion in foreign and domestic investment in the renewables sector in South Africa, it appears the winds of change in the energy sector in South Africa are more than just hot air. ☺

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