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Contents

South Africa decides to give wind and PV a tender embrace

In August 2011 the South African Department of Energy abandoned its renewable energy Feed-in Tariff, or Refit, scheme in favour of a tender mechanism and increased the initial capacity from 1,025MW to 3,725MW. The increase suggests that this is a positive move for the industry, but the abruptness of the switch and the details of the new process raise a number of questions about the viability of the programme.

- In 2008, some 93% of South Africa's electricity was produced from coal, with nuclear energy making up most of the remainder. Growing energy demand and concern over the environmental impact of coal-fired power generation has led the Department of Energy (DoE) to outline a programme that would see approximately 17.8GW of renewable energy capacity installed in the period to 2030.
- There are currently only 26MW of commissioned renewable power capacity in the country but the large size of the power market and availability of good renewable energy resources make it a prime market for development.
- The decision to abandon the Refit scheme in favour of a tender mechanism was based on concerns about the potential government liability associated with long-term feed-in tarrif schemes and issues over the legality of the procurement process.
- Onshore wind remains the favoured technology with 1,850MW of capacity under the tender, and PV a close second with 1,450MW. The solar thermal electricity generation sector received only 200MW. That could be due to the relatively high cost currently associated with the technology in comparison with PV. Other technologies received even smaller caps.
- The qualification criteria for renewable energy developers are largely reasonable in terms of their technical and financial requirements. However 30% of the evaluation is based on relatively onerous economic development criteria, which could act as a deterrent to developers. Despite this, on 31 August 2011, some 270 potential developers had already registered for the scheme.
- If the renewable energy programme is going to be successful, then the regulatory environment and the procurement process need to remain stable in order to retain investors. It is crucial that this latest mechanism switch is not the beginning of a series of changes or amendments.

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1. SOUTH AFRICA'S MASTER PLAN FOR ELECTRICITY

In 2008, some 93% of South Africa's electricity was produced from coal, with nuclear energy making up most of the remainder. This is a very high proportion compared with the OECD average of 63% of electricity from fossil fuels and a non-OECD average of 74%.[1] According to the DoE, there are approximately 50 years of domestic supplies left at present production rates. This explains the attempts to diversify the energy mix. Growing energy demand requires the country to install nearly 46GW of new capacity by 2030. Due to an ageing energy infrastructure, South Africa already has problems in meeting power demand, with conservation measures already in place.

There are also important policy considerations, including the desire to foster industries that create jobs and promote the participation of disadvantaged people within the country. The DoE is also eager to reduce the pollution levels in the country and the level of carbon emissions.

There are currently only 26MW of commissioned renewable energy capacity in South Africa (see Table 1)

Table 1: Commissioned renewable energy projects, September 2011

Name	Sector	Size (MW)	Status
Mondi Richards Bay Biomass Project	Biomass & Waste	13.2	Commissioned
Darling Wind Farm Phase 1	Wind	5.2	Commissioned
WSP Energy Mossel Bay Biogas Plant	Biomass & Waste	4.2	Commissioned
Klipheuwel wind Farm	Wind	3.2	Commissioned

Source: Bloomberg New Energy Finance

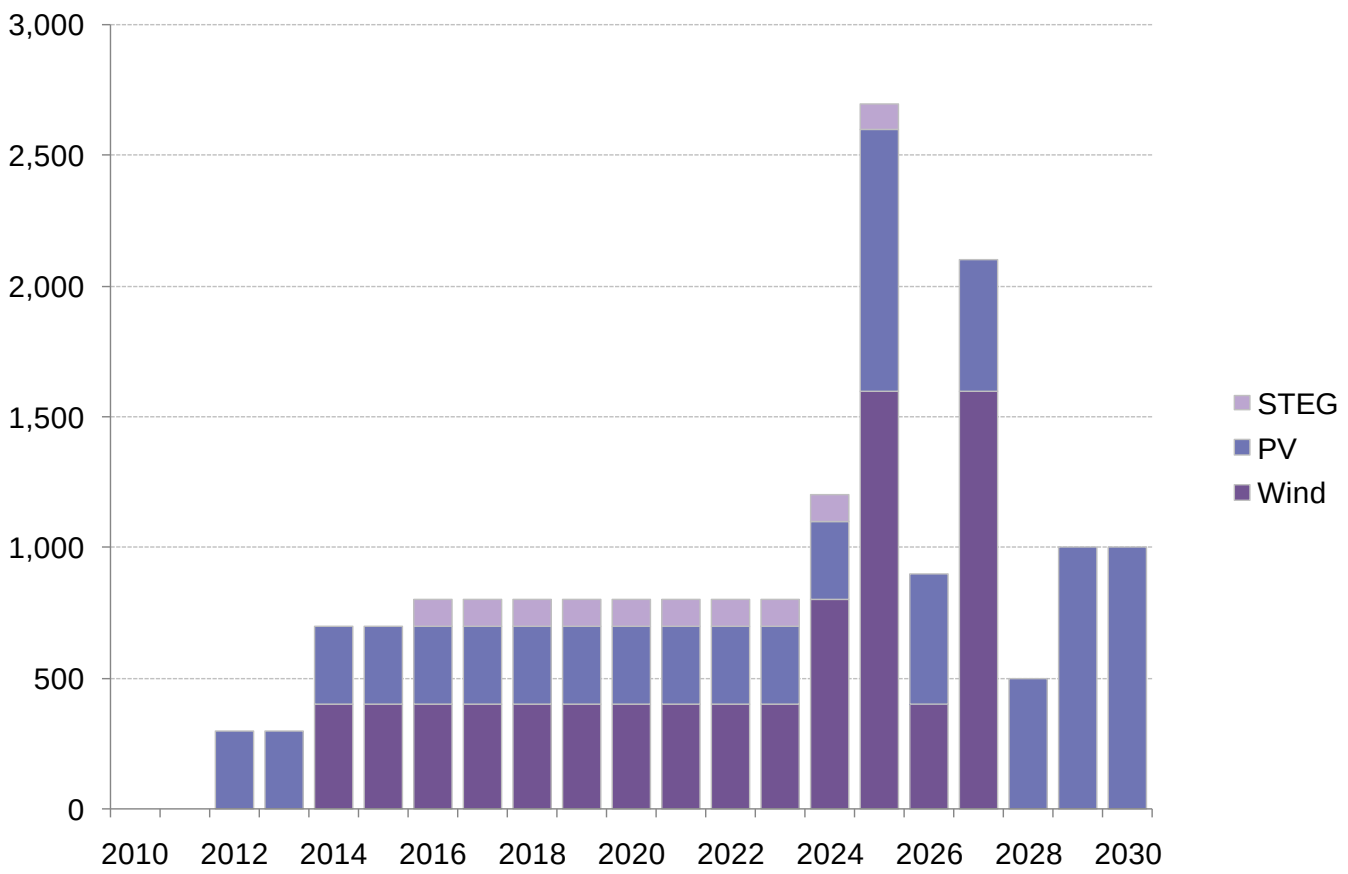
The proposal to address this shortfall and diversify the country's energy mix was published in the 2010 Integrated Resource Plan (IRP), and it maps South Africa's renewable energy strategy until 2030. It is a relatively fluid plan and is likely to be adapted every two years. The South African government maintains that the new procurement process is broadly in line with the IRP and it remains relevant. The key change here has been from a feed-in tariff mechanism to a tender mechanism.

Under the plan, 17.8GW of renewable energy will be commissioned, increasing its proportion of electricity generation from virtually zero to approximately 20% by 2030.

Under the plan, 17.8GW of renewable energy will be commissioned, increasing its proportion of electricity generation from virtually zero to approximately 20% by 2030. Of this, 8.4GW will be allocated to wind; 8.4GW to PV and a further 1GW to STEG (see Figure 1).

[1] International Energy Agency, *Energy Technology Perspectives*, 2010

Figure 1: South African clean energy proposed build-out by technology, 2010-30 (MW)



Source: South African Department of Energy Integrated Resource Plan, Bloomberg New Energy Finance

2. A CHANGE IN MECHANISM

In August 2011, the Department of Energy abandoned the Refit scheme in favour of a tender mechanism. The Refit scheme was introduced in March 2009 and guaranteed purchase prices and long-term contracts of 20 years, and 1025MW was allocated in the initial quota outlined under the Refit scheme (see Analyst Reaction, *South Africa to fire starting pistol on 18GW build-out*, 9 May 2011). However, the tariffs that had been established in 2009 were due to be significantly reduced at a review on 26 May 2011, before the programme was dissolved completely.

In August 2011 the Department of Energy abandoned the REFIT scheme in favour of a tender mechanism. However, the tariffs which had been established in 2009 were due to be significantly reduced at a review on the 26 May 2011, before the program was dissolved completely.

A bidder under the new tender programme has to satisfy both the qualification and evaluation criteria. The key criteria for both phases are outlined in 3.

The decision to switch away from the feed-in tariff scheme was based on concerns about the potential government liability associated with long-term FiTs and issues over the legality of the procurement process. The government has procurement legislation that weights the evaluation by 90% on price and by 10% on additional criteria. The initial Refit programme was exempted from this process, something that could have been disputed. There were also concerns over Nersa's ability to set a binding predetermined tariff against which the DoE could potentially be challenged when licensing projects. The tariffs outlined by Nersa were only a set of guidelines and were not detailed under the DoE legislation. This meant that it the DoE was not obliged to comply with the guidelines.

The switch to a tender mechanism could also act as a spur to innovation within the industry. Lower tariffs and narrower profit margins created via competitive bidding processes have resulted

in significant technological innovations which are better adapted for the local markets (see Research Note, *Assessing the effectiveness of clean energy policy*, 10 May 2011).

2.1. Capacity allocation

The new procurement mechanism is broadly in line with the IRP but only covers an initial 3,725MW of renewable energy capacity (see Table 2).

Table 2: Capacity allocated by technology (MW)

Onshore wind	MW
Onshore wind	1,850
PV	1,450
STEG	200
Small projects (less than 5MW)	100
Small hydro (greater than equal to 10MW)	75
Landfill gas	25
Biomass	12.5
Biogas	12.5

Source: South African Department of Energy

Onshore wind remains the favoured technology with 1,850MW of capacity under the tender, with PV a close second at 1,450MW. The STEG sector has received only 200MW, which could be due to the relatively high cost associated with the technology today, especially when compared to PV (see Market Outlook H2 2011, *Heatwave for Solar thermal,* 3 August 2011). However state-owned Eskom, which is pursuing an expansion programme separate to this tender, has recently received permissions for its 100MW Upington STEG plant and it is possible that the strategy is to allow Eskom to focus on STEG, whilst encouraging the private sector to focus on other technologies.

Onshore wind remains the favoured technology with 1,850MW of capacity under the tender, with PV a close second at 1,450MW.

2.2. Timeframe

The timeframe established by the Department of Energy is clear but probably underestimates the interest from developers in the tender. Bidders can apply for the total capacity of 3,725MW in the first submission window and if the total capacity is not satisfied, the remaining capacity will be passed through to the second submission window and so on. There are five bidding windows in total, with the final one closing on 13 August 2013. The uncertainty surrounding the South African renewable energy market and the relatively short time to prepare for the tender may result in a number of companies opting to delay participation until later submission windows when there is more clarity (see Section 5) and when they have secured all the necessary documentation. However, as of 31 August 2011, some 270 potential developers had already registered for the scheme, suggesting that the capacity target will be met sooner rather than later (see Table 3).

It is possible that the developers that were involved in the early stage Refit programme are at an advantage under this new tender mechanism. This would, in essence, reduce the available capacity for new bidders. This is because some developers, especially within the wind sector, are much further ahead in the development process, notably those that have secured Environmental Impact Assessment approval and which have set up Black Economic Empowerment partners or secured financial agreements etc. They would, however, still have to meet all the qualification criteria designed to ensure that the process remains fair.

Table 3: Timeline for first and second submission bids

Submission window	Action	Date
First submission bid	RFP issued	3 August 2011
	Bidders can submit written questions about the tender	31 August 2011
	Bidders to notify the Department of Energy if they intend to bid in either the 1st or 2nd submission windows	31 August 2011
	Bidders' conference	14 September 2011
	Last date for bidders to ask final questions	7 October 2011
	Last date for bidders to issue briefing notes	14 October 2011
	Submission window closes	4 November 2011
	Evaluation of bidders	7 - 25 November 2011
	Selection of preferred bidders	25 November 2011
	Close of all contractual arrangements including PPAs	19 June 2012
Second submission bid	Notification of opening of second submission stage	25 November 2011
	Submission window closes	5 March 2012
	Close of all contractual arrangements including PPAs	19 June 2012

Source: South African Department of Energy Note: For details on the timeframe for the remaining three submission bids, please contact the author.

The timeframe for commissioning the projects under the first submission bid window is the end of June 2014 for all the technologies, apart from STEG where the deadline is June 2015 due to a longer construction phase.

3. QUALIFICATION AND EVALUATION CRITERIA

3.1. Financial criteria

Table 4: Tariff caps for each technology

Technology	Tariff cap (ZAR/MWh)
Solar PV	2,850 ($405/MWh)
STEG	2,850 ($405/MWh)
Onshore wind	1,150 ($163/MWh)
Biomass	1,070 ($152/MWh)
Small hydro	1,030 ($147/MWh)
Biogas	800 ($114/MWh)
Landfill gas	600 ($85/MWh)

Source: South African Department of Energy

Under the Refit programme, a project would receive a fixed tariff per kWh of electricity generated. Under the tender mechanism however, bidders will have to propose a tariff which will fall under a technology-dependent cap (see Table 4). The proposed prices should make a single adjustment on 1 April each year, in line with expected decreasing costs.

These tariff caps seem quite reasonable in comparison with the rates project developers are receiving under different schemes across the world. The tariff for ground-mounted PV systems in Spain in 2010 ranged from EUR 259 ($374) per MWh to EUR 281 ($406) per MWh, while for STEG projects it was roughly EUR 285 ($411) per MWh. Onshore wind projects in the UK meanwhile received approximately GBP 113 ($184) per MWh in 2010, although this is likely to decline as the price of Renewable Obligation Certificates declines and a feed-in tariff is introduced (see Market Outlook, *European REC service long term outlook,* 16 August 2011). Biomass fuel costs vary by location, but the global LCOE for biomass by anaerobic digestion was approximately $150/MWh in Q2 2011. The global LCOE of landfill gas in Q2 2011 was approximately $60/MWh. Based on these estimates (see Research Note, *Levelised cost of energy update: Q2 2011*, 18 July 2011), the tariff caps for each of the technologies covered in this tender allocation are reasonable.

Some 70% of the South African tender mechanism evaluation system is geared towards the financial aspects of the project, with the remaining 30% derived from the economic aspects (see Section 3.3). This heavily weights the bidding process towards low bids and, based on evidence

from similar schemes in other countries, there is a risk that a number of developers submit financially unviable bids, resulting in delays or non-deployment. This highlights one of the main flaws associated with the tender mechanism that has led to delays under similar schemes in other countries. At the 12th Energy Auction in Brazil held on the 17-18 August 2011, for instance, the average contract price for wind projects was $62/MWh, representing the lowest market-wide tariff seen to date (see Research Note, *Brazil's 2011 tenders: low prices, high risks*, 25 August 2011). Wind successfully under-bid conventional natural gas-fired projects, but at least 25%-50% of total tendered capacity in Brazil is expected to experience severe delays due to unviable bids (see Research Note, *Wind tender analysis in Brazil: Winner's curse?*, 28 September 2010).

3.2. Technical criteria

In order to minimise the risk of delays and of project failures the DoE has outlined a number of technical criteria which developers have to meet before being eligible for the bidding process.

Table 5: Technical criteria according to technology

Sector	Minimum capacity (MW)	Max capacity (MW)	Experience
Onshore wind	1	140	Developer must have worked on 2 projects of comparable scope and duration (although this is not restricted to the renewable energy sector.
Solar PV	1	75	The inverter type must have been used in two commercial projects for 24 months with 95% technical availability/ The module type must have used in two commercial projects for 12 consecutive months with 95% technical availability.
STEG	1	100	The solar concentration system, heat receiver, heat transfer fluid and handling system, electrical generation system, cooling system and thermal storage system (if applicable) must have been used in 2 commercial projects for at least 24 months or 36 months for a demonstration project.
Biomass	1	10	The fuel handling systems, fuel conversion and prime mover technology must have been operating at a technical availability of 75% for 12 consecutive months
Biogas	1	10	The proposed anaerobic digestion concept must have been in use for at least 24 months and operated at similar scale for the project. Prime mover technology must have been in use for at least 12months with 80% technical availability.
Landfill gas	1	10	Prime mover technology must have been in use for at least 12months with 80% technical availability. Gas booster and flare equipment must have been in use for at least 12 months in 2 different commercial landfill gas projects and have been shown to comply with the South African requirements for safety and environmental performance.
Small hydro	1	10	The proposed turbine and generator manufacturer must have supplied similar equipment in 2 different hydropower projects at a scale greater than 1 MW and operating for a period of at least 24 months.

Source: South African Department of Energy Note: There are a number of other criteria such as accurate resource data, water usage information, and other environmental considerations a depending on the technology. Technical Availability = (total hours in year – hours of outage due to planned and unplanned maintenance) ÷ total hours in year

The technical criteria appear reasonable and only developers with some experience will be able to apply for this. As with the capacity allocations, wind appears to be the most trusted technology eligible under this tender. This is likely to be because the technology is relatively mature and, as long as the turbine model is certified, the conditions laid out for developers and contractors simply stipulate that they must have experience on a least two projects of comparable scope and size. The permitted capacity limits for each sector are realistic caps for each technology based on the standard sizes of projects within each technology.

Although there are a number of linear Fresnel and tower and heliostat demonstration plants, the requirement of 36 months of operation may prevent some new developers from applying for this tender. Novatec, for instance which is one of two linear Fresnel developers to have secured

commercial financing for utility-scale plants in 2011, does not appear to be eligible for the tender, since it has not had an operational demonstration plant that has operated for the required 36 months. Other major developers in these two less mature industries would be eligible, but restricting the number of developers that can compete in these subsectors is unlikely to result in the best bids being submitted (see Market Outlook H2 2011, *Heatwave for solar thermal*, 3 August 2011).

3.3. Economic Development policy

These criteria have been highlighted in order to ensure that the renewable energy development programme pursued by the South African government has a beneficial economic impact on the country. As Table 6 shows, the most important criteria are to create locals jobs, increase local manufacturing and to ensure that South African citizens have a meaningful stake in the programme. It is important to note that there are minimum thresholds for job creation, local content, ownership, and socio-economic development. Bidders are also required to have 40% South African participation in the project company.

Table 6: Economic Development evaluation criteria weighting

Economic Development Elements	Weighting
Job creation	25%
Local content	25%
Ownership	15%
Management control	5%
Preferential procurement (buying locally)	10%
Enterprise development	5%
Socio-economic development	15%

Source: South African Department of Energy

Despite only accounting for 30% of the overall evaluation process, the economic development criteria also serve as an eligibility process due to the minimum thresholds. This will make it significantly easier for organisations that have been involved in South Africa for a number of years, since they will have a better understanding of the requirements and are likely to have already established joint ventures within the country. Mainstream Renewable Power, for instance, formed a JV with Genesis Eco-Energy (a South African renewable energy developer) as early as 2009. New bidders are likely to be at a disadvantage in this tender process. This is not necessarily to the benefit of the process itself because it acts as a limiting factor.

The insistence on local procurement also raises concerns over whether the South African market is advanced enough to ensure the quality of the materials for the fulfilment of the renewable energy programme. It is worth noting that thin-film technologies have been exempted from a number of the requirements due to the technically complex manufacturing process. It is currently unclear whether these eligibility requirements will be detrimental to the quality of projects in other sectors. They could even deter some developers from entering the programme. The local manufacturing eligibility criteria also raise doubts as to whether the capacity allocation will be sufficient to entice foreign developers to set up operations in the country. The relatively small allocation of 1,025MW under Refit was insufficient to entice foreign developers and, although the capacity has more than doubled, it remains to be seen if it is enough. The IRP, however, gives a better long-term idea of the potential of the South African market and if it is adhered to it is likely to prove sufficient. The need for greater involvement from foreign manufacturers and developers is highlighted by the absence of an existing local renewable energy industry: Palm Tree Power is the only company that manufactures wind turbines locally and it is relatively small (300kW devices). There is only 121MW per annum of PV manufacturing capacity.

Another potential issue for companies to address is the strict ownership rule, associated with the tender. This requires a minimum shareholding for "black people" in the project company. This is an established term in the DoE's proposals and is defined by the South African government and outlined in its documents as "natural persons who are Africans, Coloureds and Indians, limited to those who are citizens of the Republic of South Africa". This is an integral part of South Africa's affirmative action policies, but insisting on a split shareholding could impact upon the potential returns of the project for the owner.

4. KEY STAKEHOLDERS

On 31 August 2011, some 270 potential developers had registered for the scheme. A number of companies already have an established presence in the country and some have already secured the necessary environmental permits (see Table 7) and financial agreements.

Three wind developers are known to be in the advanced stage of development and have financial agreements in place conditional on them winning preferred bidder status.

The 300MW Cookhouse Wind project is being developed by African Clean Energy Developments (ACED), a joint venture between African Infrastructure Investment Managers and AFPOC, with partner Industrial Development Corporation (IDC). ACED has signed a deal with Suzlon Energy to supply the initial 76 wind turbines for the project. Suzlon will provide engineering, procurement and construction services for the project and supply its S88 2-megawatt turbines. Standard Bank and Nedbank have been mandated as lead arrangers for financing the project.

Red Cap Investment's 300MW Kouga Wind Project, which is to be developed in phases, will cost ZAR 1.8bn ($260m) for the first 100MW phase. The project is expected to be financed 70% by debt and 30% by equity with its partners - Standard Bank, Evolution One and the Industrial Development Corporation-backed community trust.

Mainstream Renewable Power's 165MW wind farm in Jeffrey's Bay is a joint venture with Genesis Eco-Energy. The wind farm is expected to cost over ZAR 2bn ($289m). Mainstream Renewable Power has financed the development phase of the project, at about ZAR 800m ($ 116m), using its own equity for the first phase.

Chinese supported projects are likely to be able to offer competitive bids due to the low cost of capital and cheap manufacturing.

Another interesting development which could impact on the evaluation process is the involvement of Chinese stakeholders in the tender process. For instance, Mulilo Energy, which is looking to develop a number of projects in the country, has signed a memorandum of understanding with Yingli Solar (third largest solar company in 2010 in terms of global module production, with 5.9% of the world market) and the Chinese Africa Development Fund will assist in funding the projects.

China's Suntech Power Holdings is supplying panels for a 50MW solar plant at Droogfontein, and China Longyuan Power Group announced in 2010 that it would develop wind farms in South Africa. China has already invested significant amounts of capital in Africa in broader infrastructure projects and is to date South Africa's largest trading partner. The state-owned China Development Bank established a $1bn fund in 2007 to finance Chinese enterprises in Africa and now plans to increase that to $5bn. We could see a large scale push into renewable energy as a result. Chinese-supported projects are likely to be able to offer competitive bids due to the low cost of capital and cheap manufacturing.

Many major wind manufacturers regard South Africa as an important developing market and many were involved in projects bidding for the initial Refit programme. There does not appear to be a single manufacturer which is likely to receive the majority of orders, with the pipeline spread relatively evenly across the different major manufacturers such as Suzlon, Vestas, Goldwind, Siemens and GE. The tight margins facing manufacturers in other large potential markets such as Brazil and China make South Africa appear attractive. More details about the stakeholders involved and their development plans will become available following the bidders' conference, which will be held on 14 September.

Table 7: EIA approved projects, August 2011

Name	Sector	Developer	Capacity	Location
AB's Wind Energy Facility	Wind	DNA Wind Farm	48-72MW	Eastern Cape Province
Exxaro West Coast Wind Energy Facility	Wind	Exxaro Resources	66MW	Western Cape Province
Riverbank Wind Energy Facility	Wind	Just Energy	66MW	Eastern Cape Province
Klipheuwel /Dassiesfontein Wind Farm	Wind	Biotherm Energy	16 turbines (n/a MW)	Western Cape Province
West Coast One Wind Energy Facility	Wind	Moyeng Energy (GDF Suez and Investec Bank)	99-138MW	Western Cape Province
Suurplaat Wind Energy Facility	Wind	Moyeng Energy	1200MW (400 turbines)	Western Cape and Northern Cape Province
Dorper Wind Energy Facility	Wind	Rainmaker Energy Projects	488-732MW	Eastern Cape Province
ACSA PV Photovoltaic Installations	Solar PV	ACSA PV (The Power Company, Built Africa and the Airports Company South Africa)	20MW spread between four airports.	Tambo airport, Bloemfontein airport, Kimberley Airport, Upington airport
Kouga Wind Energy Project	Wind	Genesis Eco-Energy	15MW	Near Jeffrey's Bay
Caledon Wind Farm	Wind	Epispan (trading as Caledon Wind)	300MMW	Western Cape Province
Kouga Wind Farm	Wind	Red Cap Kouga Wind Development Company	300MW	Eastern Cape
Cookhouse Wind farm	Wind	African Clean Energy Developments	300MW	Eastern Cape
Golden Valley	Wind	Terra Power Solutions, General Electric International	500MW	Eastern Cape
Waainek Wind Farm	Wind	InnoWind Limited	36MW	Eastern Cape
Nelson Mandela Wind Farm	Wind	CEF	23MW	Eastern Cape
Hopefield Wind Farm	Wind	African Infrastructure Investment Managers and Umoya Energy	100MW	Western Cape
Vredendal Wind Project	Wind	iNca Vredendal Wind	40MW	Western Cape
Jeffrey's Bay	Wind	Mainstream Renewable Power (Siemens)	165MW	Eastern Cape

Source: Environmental Impact Assessments, Savannah Environmental, South Africa Department of Energy, Bloomberg New Energy Finance
Note: Unfortunately, this list may be incomplete: there is not a current and up to date list of projects which have received EIA approval and this list has been compiled based on the sources listed and additional market research. This is further evidence of the lack of transparency surrounding the South African renewable energy market.

State-owned Eskom Holdings is not able to bid on this tender and it is instead pursuing a separate expansion programme in order to help address South Africa's energy needs. Solar thermal is being used in hybrid or augmentation systems, which could complement Eskom's regeneration strategy. The 44MW Kogan Creek linear Fresnel project in Australia, for instance, which received financing on 13 April 2011, is configured to provide feedwater pre-heating for a local coal plant. It would make sense for Eskom to develop this type of technology because of the synergies with its existing coal based electricity generation facilities (see Market Outlook H2 2011, *Heatwave for solar thermal*, 3 August 2011). Eskom is also currently developing a number of other projects, notably the 100MW Sere Wind Farm, for which it has received loans from the African Development Bank, the World Bank's Clean Technology Fund and the Agence Française de Développement (AFD).

5. THE NEED FOR STABILITY

In addition to the challenges of adhering to the Economic Development criteria (see Section 3.3), the most important concern is one of lack of stability created by the abandonment of Refit. Globally, investors and developers have insisted for years that stability is paramount and lower tariffs would be tolerated if accompanied by stability. The lack of transparency which surrounded

the decision to abandon Refit and there is still confusion regarding the value of how this tender programme fits into the IRP. The fact that potential developers had to pay ZAR 15,000 ($2,100) even to obtain a copy of the Request for Proposal hardly endears them to the process.

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