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- Project Finance Latin American Wind Deal of the Year 2013 - Orosi 50 MW wind farm
- Infrastructure Journal Power Deal of the Year 2013 - Azito 139 MW Expansion
- Project Finance African Power Deal of the Year 2013 - Azito Expansion
- ACQ Magazine International Energy Business of the Year (Emerging Markets) 2013

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Foreword
CLEAN ENERGY PIPELINE

Some of our expert guides almost write themselves. The Clean Energy Africa Finance Guide certainly didn’t. For at least two years we have been speaking to the market about the renewable energy opportunity in Africa and appetite for a dedicated expert guide on the region. There has always been interest but until recently this was restricted to a few law firms, a handful of smaller developers and the local financial community. Interest was also very much focused on South Africa and Morocco.

It’s very hard to pinpoint when we reached a tipping point but if I was to pick a date it was very early this year. What changed? South Africa’s growing commitment to the sector has certainly helped. Since August 2011, the REIPP Procurement Programme has attracted over $10 billion of foreign investment in respect of approximately 4,000 MW of new renewable electricity generation capacity. However, it’s the irrefutable combination of: a fast growing population; severe electricity shortages; the long construction lead time for traditional power plants; and the exorbitant cost of diesel as a replacement energy source during outages that has forced renewables to the forefront as one of the most obvious energy solutions available to Africa today. The abundance of high quality renewable energy resource – solar, wind, geothermal and hydro – makes the argument for renewables even more compelling.

Many of the white papers in the guide highlight the challenges associated with realising this opportunity. Resolving these challenges will not be easy but based on the current interest from seasoned investors, developers, advisers and banks, there is a genuine willingness to find solutions. There is also an acknowledgement that, compared with other more mature renewables markets, Africa really looks like the golden ticket.

This is the first edition of the Clean Energy Africa Finance Guide but given the opportunity (and the challenges) I think it’s our most valuable yet. With white papers contributed by Macfarlanes, Mazars, Sgurr and Denham Capital, supported by detailed industry data and a comprehensive directory, this is a critical information source for any investor, developer, adviser or corporate looking to do business in clean energy in Africa.

Lastly and as always I would like to thank all our sponsors and my research team.

Douglas Lloyd
Founder & CEO
Clean Energy Pipeline
www.cleanenergypipeline.com
South Africa’s Renewable Energy Programme
AN AFRICAN SUCCESS STORY

South Africa’s Renewable Energy Independent Power Producer Procurement Programme (REIPP Procurement Programme) has been a huge success since it was launched in August 2011.

In just over three years, four rounds of competitive bidding have been successfully completed. From a standing start, numerous projects across different renewable technologies have raised financing, completed construction and grid connection and achieved commercial operations, and many more will do so in the next few years. The projects have brought much needed new capacity to the South African grid, helping to keep the lights on and industry producing. They have also brought SA’s first substantial renewable output in a country dominated by coal fired power. To date, the programme has attracted over USD$10 billion of foreign investment in respect of approximately 4,000 MW of new renewable electricity generation capacity.

The REIPP Procurement Programme has also brought significant benefits to South Africa in key areas such as local ownership and participation by South Africans in the power sector, new jobs and the creation of a local manufacturing industry.

Background

The energy crisis in South Africa and throughout Africa continues. South African industry is energy intensive, with mining, smelting and pulp and paper production being key contributors to the economy and growth.

However, the current capacity of approximately 40,000 MW is insufficient to provide reliable power and in recent years industry and consumers have been subject to widespread load shedding. In 2007 and 2008, for example, there were long periods when power was available only in rolling two hour windows, and severe constraints meant that mines had to be closed for a week in January 2008. And, at the time of this article going to press, load shedding in parts of the country is once again front page news.

South Africa’s electricity generation continues to be dominated by Eskom Holdings SOC Limited (Eskom). Eskom is a state-owned company which produces approximately 96% of the electricity used in South Africa and also owns and controls the transmission system. Some 90% of the electricity is generated from coal. Eskom generates two-thirds of Africa’s electricity
and also sells electricity to neighbouring countries as well as importing electricity regionally.

The South African government recognises that Eskom alone does not have the capacity to meet South Africa’s increasing electricity demand and ensure energy security. The government’s Integrated Resource Plan (IRP) sets an ambitious target to add 50,000 MW of new generation capacity to the South African grid by 2028 with renewable energy technologies accounting for approximately 42% of this target.

It is against this background that the South African government developed an extensive policy and legal framework to support renewable energy generation. As part of this approach, the National Energy Regulator of South Africa (NERSA) initially developed a renewable energy feed-in tariff (REFIT) scheme to procure power from independent power producers (IPPs) at predetermined prices for sale to Eskom.

However, the South African government, through the Department of Energy (DoE), decided to replace REFIT in August 2011 with a modified form of price tendering by launching the REIPP Procurement Programme. Under the programme, the DoE initially mandated the procurement of up to 3,625 MW from IPPs of various renewable energy technologies: wind, solar photovoltaic, concentrated solar power, biogas, biomass, small hydro and landfill gas. An additional 3,100 MW was subsequently made available for procurement under the REIPP Procurement Programme and in October it was announced that a further 1,500 MW is in the final stages of approval.

Structure of the REIPP Procurement Programme

Under the programme, bids are invited from developers in sequential bidding rounds, or “windows”. To date, there have been four bidding windows, with the fifth expected to take place around May or June 2015. Potential bidders are required to register basic details of their proposed project(s) approximately two months ahead of the relevant bid window and unsuccessful projects can be bid again in future windows.

In each bid window, a maximum number of MW is made available for each applicable technology and a price cap is set (although the DoE has now scrapped the price cap for wind and solar photovoltaic projects, having concluded that intense competition has driven down prices and rendered a cap redundant).

The bid documents (RFP) issued under the REIPP Procurement Programme contain detailed and complex requirements. Bid responses must comply with all of the qualification criteria to be compliant. In a nutshell, the qualification criteria require bidders to provide detailed responses as to the extent of their readiness to deliver their projects in key areas such as project structure, compliance with specific legal, land, environmental, financial, technical and economic development requirements.

Bid responses are assessed in two stages. In the first stage, each bid response is assessed using the qualification criteria set out in the RFP to determine whether the bid response is a compliant bid.

A bid response that does not meet all of the qualification criteria is excluded from the second stage.

In the second stage of evaluation, all compliant bids are evaluated on a comparative basis using the prices (for 70% of the total) and economic development proposals (for 30% of the total) contained in the compliant bids.

Although no minimum score has been published by the DoE, the top scoring projects for each technology are awarded preferred bidder status and given a specified amount of time to achieve financial close and sign the
Power Purchase Agreement (PPA), Implementation Agreement (IA) and other designated project agreements. These agreements are set out in the RFP and may not be marked up, amended or negotiated. Any attempt by a bidder to do so will result in disqualification.

Each bid must include two prices: a fully indexed price and a partially indexed price. When selecting preferred bidders, the DoE has complete discretion to choose either the fully indexed or the partially indexed price offered by a compliant bidder.

### Unique features of the REIPP Procurement Programme

There are certain criteria that are peculiar to the South Africa context and have been designed to advance the South African government's socio-economic development policy objectives. Most of these criteria have minimum compliance thresholds as well as higher targets which a bidder can commit to if it wishes to enhance the competitiveness of a bid at the evaluation stage.

Those criteria which have minimum compliance thresholds as well as targets are:

- the South African Entity Participation requirement – a bidder must ensure that at least 40% of the beneficial shareholding in the project company is directly or indirectly held by South African citizens;
- minimum thresholds and targets for job creation – each bidder must make commitments to ensure that a certain percentage of its employees during the construction and operation phase are South African citizens of which a certain percentage must be black South Africans;
- minimum thresholds and targets for local content – this is intended to measure the construction expenditure of a project and to express the South African products and services component as a percentage of the total project cost;
- minimum thresholds and targets for black ownership – this requires a bidder to ensure that the project company allocates a certain percentage of its ultimate beneficial shareholding to black South Africans;
- minimum thresholds and targets for local community ownership – this requires a bidder to ensure that the project company allocates a certain percentage of its ultimate beneficial shareholding to local communities; and
- minimum thresholds and targets for socio-economic development – this requires a bidder to identify socio-economic needs of the surrounding communities where the project site will be located and formulate strategies on how such needs could be met utilising the socio-economic development financial contributions.

### General requirements of the REIPP Procurement Programme

The general requirements of the REIPP Procurement Programme include criteria or “gatekeepers” with respect to the following:

- **the project structure** – this requires a bidder to provide, among other things, a structural diagram showing its debt and equity participants, contractors and key equipment suppliers;
- **legal requirements** – this requires a bidder to indicate, among other things, its acceptance of the terms of the PPA, IA and the other designated project agreements;
- **land acquisition and land use requirements** – this requires a bidder to show, among other things, that it has secured the project site, identified all permits and licences required for the project with respect to land rezoning, subdivision and water use;
- **environmental consent requirements** – a bidder must provide, among other things, the environmental authorisation and related documents;
- **financial requirements** – this requires a bidder to specify, among other things, its price, identify its method of financing the project and demonstrate that it has made sufficient progress in securing financing for its project and the necessary proof of its ability to raise such financing;
- **technical requirements** – a bidder is required to provide, among other things, information on the technology to be used, resource data, contractor capability and track record and a cost estimate letter for grid connection;
- **economic development requirements** – a bidder must make binding commitments (during both construction and operations phase) with respect to share ownership by black South Africans and local communities, local content, job creation, preferential procurement, management control, socio-economic development and enterprise development; and
- **value for money** – each project must provide net benefit to the South African government and consumer taking into account, without limitation, the price offered, the bidder’s internal rate of return and level of success payments.

1,984 MW

Wind capacity awarded during windows one, two and three.
There are certain socio-economic development criteria with which bidders need not comply for the purposes of bid compliance. However, if a bidder wishes to enhance the competitiveness of its bid response, it can make commitments with respect to any and/or all of the following criteria:

- management control targets – commitments that a certain percentage of the project company’s management will comprise black South Africans;
- enterprise development targets – commitments to initiatives that will enhance the capacity of emerging businesses owned or controlled by black South Africans; and
- preferential procurement targets – commitments to procure goods and services from businesses owned or controlled by black South Africans.

The story so far

After the first three bid windows, 64 projects have been selected as preferred bidders. A substantial number of these projects have reached financial close and are already in commercial operation. The fourth bid window closed on 19 August 2014 and it is anticipated that the preferred bidders will be announced imminently.

There has been significant global investor interest and all bid windows have been oversubscribed, with prices dropping significantly in each bid window. The table below illustrates megawatts awarded and the extent to which prices have dropped in the first three bid windows across wind, solar photovoltaic and concentrated solar power technologies.
One of the most important objectives of the South African government is to enhance local manufacturing through the RFP’s requirements on local content and job creation. As shown in the table below, the DoE has gradually increased the thresholds and targets for local content, taking into account a number of factors including the bid responses submitted at previous bid windows.

The REIPP Procurement Programme has certainly given impetus to the South African government’s localisation drive by creating a local manufacturing industry for some of the key equipment components required in renewable energy projects. For instance, two local tower manufacturing facilities have been established in the Eastern Cape and the Western Cape provinces and a number of solar panel assembly plants have also been set up in various parts of South Africa with more similar localisation initiatives in the pipeline.

### Local content targets and job creation in the REIPP Procurement Programme

<table>
<thead>
<tr>
<th>STATISTIC</th>
<th>FIRST BID WINDOW</th>
<th>SECOND BID WINDOW</th>
<th>THIRD BID WINDOW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WIND</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local content threshold</td>
<td>25%</td>
<td>25%</td>
<td>40%</td>
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<tr>
<td>Local content target</td>
<td>45%</td>
<td>60%</td>
<td>65%</td>
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<td>ZAR 2,766,000,000</td>
<td>ZAR 4,001,000,000</td>
<td>ZAR 6,283,000,000</td>
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<td>Local content percentage</td>
<td>21.70%</td>
<td>36.70%</td>
<td>46.90%</td>
</tr>
<tr>
<td>Job creation: construction (South African citizens)</td>
<td>1,810</td>
<td>1,787</td>
<td>2,612</td>
</tr>
<tr>
<td>Job creation: operations (South African citizens)</td>
<td>2,461</td>
<td>2,238</td>
<td>8,506</td>
</tr>
<tr>
<td><strong>SOLAR PHOTOVOLTAIC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local content threshold</td>
<td>35%</td>
<td>35%</td>
<td>45%</td>
</tr>
<tr>
<td>Local content target</td>
<td>50%</td>
<td>60%</td>
<td>65%</td>
</tr>
<tr>
<td>Local content value bid</td>
<td>ZAR 6,261,000,000</td>
<td>ZAR 5,727,000,000</td>
<td>ZAR 3,698,000,000</td>
</tr>
<tr>
<td>Local content percentage</td>
<td>28.50%</td>
<td>47.50%</td>
<td>53.80%</td>
</tr>
<tr>
<td>Job creation: construction (South African citizens)</td>
<td>2,381</td>
<td>2,270</td>
<td>2,119</td>
</tr>
<tr>
<td>Job creation: operations (South Africa citizens)</td>
<td>6,117</td>
<td>3,809</td>
<td>7,513</td>
</tr>
<tr>
<td><strong>CONCENTRATED SOLAR POWER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local content threshold</td>
<td>35%</td>
<td>35%</td>
<td>45%</td>
</tr>
<tr>
<td>Local content target</td>
<td>50%</td>
<td>60%</td>
<td>65%</td>
</tr>
<tr>
<td>Local content value bid</td>
<td>ZAR 2,391,000,000</td>
<td>ZAR 1,638,000,000</td>
<td>ZAR 5,627,000,000</td>
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<tr>
<td>Local content percentage</td>
<td>21%</td>
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<td>Job creation: construction (South African citizens)</td>
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<td>1,164</td>
<td>3,082</td>
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<tr>
<td>Job creation: operations (South African citizens)</td>
<td>1,382</td>
<td>1,180</td>
<td>1,730</td>
</tr>
</tbody>
</table>

Source: DoE
The Role of EPC

One qualification criteria which has become a key part of the programme is the engineering, procurement and construction (EPC) arrangements. A bidder has to provide details of its EPC contractor, including its track record and capability in building the power plant.

With continued pressure on tariff pricing there may be a move towards split contract structures (where the project company employs a turbine supplier and a separate balance of plant contractor – and manages the interface between the two).

Although this is not a specific bid compliance requirement, a competitive EPC price is essential for a successful project and a balance needs to be struck between risk transfer to the EPC contractor and price. Lenders will want the project company to be insulated from risk, yet a blanket approach will not be accepted in the market. With experienced and well resourced sponsors in place, there is scope for the project company to take on appropriate risks – but this is all in the context of fixed “upstream” project documents (the PPA and IA) that govern the process and place fixed obligations and timings on the project company. These documents (and their impact on the EPC and operations and maintenance arrangements) need to be understood, as they establish a framework for the construction and operation of the projects.

The correct flow-through of processes (in particular during commissioning and commercial operation) and project relief (whereby the EPC contractor’s relief under the EPC contract is limited to that which the project company obtains under the project documents) are essential and must be considered pragmatically and commercially. Other key issues that need to be addressed include:

- dealing with delays caused by Eskom (in particular in relation to grid connection);
- site risk under the PPA;
- site access;
- payment structures and security;
- how issues particular to the local construction market can impact on construction and operation;
- exchange rate risk;
- economic development obligations; and
- access to the transmission or distribution system.

With continued pressure on tariff pricing there may be a move towards split contract structures (where the project company employs a turbine supplier and a separate balance of plant contractor – and manages the interface between the two).

Challenges and lessons learned

1. The cost of bidding has been high due to the detailed and complex nature of the bidding requirements. The DoE has sought to simplify bidding requirements (and therefore lower bidding costs) by making the following changes to the bid documents for the fourth bid window:

   - bidders no longer need to submit shareholders’ agreements in respect of the project company or heads of terms with their contractors and key equipment suppliers at the time of submission. This eliminates advisory and other associated costs incurred through negotiating these documents at the bid stage;

   - certain licences and consents are not required until the preferred bidder stage;

   - the terms on which lenders can issue a letter of support to provide debt financing have been relaxed; and

   - bidders only need to provide two hard copies and a soft copy of the bid response as opposed to seven hard copies and seven soft copies as was the case in previous bid windows.

2. Currently, the requisite licences and consents are obtained under different pieces of legislation and from different government departments with different timings and procedures. A single umbrella legal framework for renewable energy procurement with a ‘one-stop shop’ government department for licenses and consents would make the bidding process more efficient and this would also help reduce the costs associated with liaising with different departments.

3. Securing the project site is a key component of the bidding process. It is therefore important for a bidder to identify the project site and conclude the necessary contracts in sufficient time to ensure that the land arrangements meet land use and acquisition criteria. It is also important for bidders to resolve any land tenure issues such as any third party rights, existing mortgages and land claims in respect of the site at the earliest possible stage of the bidding process as this could have a negative impact on the bid compliance and bankability of the project.

4. Due to financial constraints, there have been concerns regarding Eskom’s ability to build the network infrastructure necessary to connect the large number of successful projects to enable them to achieve commercial operations within the time frames specified in the PPAs. In addition, grid connection costs have now become an issue as the initial cost estimate letters provided by Eskom at bid submission vary substantially from subsequent budget quotes provided to preferred bidders. This has caused a delay in successful third bid window projects reaching financial close.
The way forward

To ensure that the success of the REIPP Procurement Programme is sustained in the long term, the DoE will need to deal with a number of challenges. These include:

- creating market certainty and confidence that more capacity allocation will be made available on a multi-bid window basis over an extended period of time;
- maintaining investor appetite in light of the significant price reductions in the first three bid windows;
- further simplifying the bid documents to reduce bidding and evaluation costs;
- working together with Eskom to ensure long term planning on grid connection costs and network capacity; and
- enabling smaller scale projects to gain a foothold in South Africa’s emerging renewable energy industry.

Conclusion

The REIPP Procurement Programme is a genuine success story for renewable energy procurement in Africa. Whilst the programme needs to continue to evolve to meet and overcome challenges such as grid connection, it has real potential to help alleviate SA’s electricity crisis and contribute to economic growth and development for decades to come.

Although there is no one-size-fits-all solution to the rest of Africa’s renewable energy procurement requirements, the South African programme provides a positive example of how a successful programme can be launched and bring real results and discernable benefits in a short time frame.

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We have extensive experience of advising sponsors, project companies, financiers, governments and financial advisers on all aspects of clean energy projects in Africa and elsewhere. This includes advising more than 100 developers, lenders and sponsors in connection with South Africa’s REFIT and REIPP programmes. We can therefore anticipate issues and challenges that may arise during a project and find practical, commercial solutions to meet our clients’ needs.

Many of our clients’ projects bring together various disciplines; we are able to draw on the expertise of lawyers from our energy and natural resources, environment, banking and finance, real estate, construction, corporate, mergers and acquisitions, and restructuring and insolvency teams, ensuring that we achieve the best outcome for clients however complex the issues.

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UNDERSTANDING THE CHALLENGE

Prospects for renewable energy in Africa can only be understood in the context of the massive undersupply of power in most of the continent. Renewable energy investment is viable only when projects are implemented as part of a coherent plan to widen access to affordable electricity and improve the reliability of its supply, writes David Donnelly of Mazars LLP.

Background – the scale of the challenge and the opportunity

The opportunities are great …

No-one doubts the need for sustained large-scale investment in power generation and networks throughout sub-Saharan Africa. The need is driven by Africa’s high levels of economic and population growth, combined with electricity generation capacity and supply infrastructure that in most cases cannot meet current demand, and leaves millions without direct access to electricity.

Renewable energy investment can be a major part of the solution to sub-Saharan Africa’s electricity supply shortage. Renewable energy offers the benefits of security of supply and predictability of cost based on ample renewable resources - high quality hydro, solar, wind or geothermal - depending on location. Other than large-scale hydro, it offers a shorter timeframe before start of operations, and greater flexibility in terms of locating generation closer to end-users than is possible with large thermal plant. With the right project scale and location it can be competitive with new fossil fuel based thermal plant, in terms of cost of supply to the end-user.

… with an 80 GW non-hydro renewables sector by 2040

There are real prospects for rapid growth in renewables in sub-Saharan Africa. The International Energy Agency (IEA) has forecast¹ an estimated quadrupling of generation capacity to 385 GW by 2040 (360 GW grid-connected). Investment in transmission and distribution will have to be broadly at the same level as the investment in power generation. Under the IEA forecast renewable energy capacity (other than large-scale hydro) increases from under 1 GW at present² to 80 GW. Under this scenario 315 million people in rural areas gain access to electricity: 95 million through grid expansion, 140 million through mini-grids and 80 million through off-grid power. PV solar is forecast to account for 70% of the off-grid and mini-grid networks, largely supported by back-up oil-fired generation.

¹ International Energy Agency: Africa Energy Outlook: a focus on energy prospects in sub-Saharan Africa (October 2014). Except where noted statistics in this article are sourced from this IEA report.

² This includes some of the early projects of the South African Renewable Energy Independent Power Project Procurement Programme (REIPPPP), but not those commissioned in recent months.
Clean Energy Pipeline data shows that as of October 2014, there were 21 specific renewables projects in sub-Saharan Africa (excluding South Africa) in pre-construction development involving international sponsors or funders, totalling approximately 4.2 GW of capacity. Geothermal projects in Kenya and Ethiopia accounted for about half of this capacity with solar and wind representing the bulk of the remainder. The majority of these projects have still to secure full funding commitments, and as such represent opportunities for investors and lenders.

…but so are the challenges

Aside from the general economic, political and social issues which determine the investment climate in a particular country, renewable power sector sponsors and investors must consider the broader picture:

- Although diverse and large geographically and in terms of population, the African power market is small in terms of output: energy consumption in sub-Saharan Africa may have risen by 45% since 2000 but still only totals 90 GW (vs. 85 GW in the UK) of which about half is in South Africa. Installed renewables capacity (other than large-scale hydro) is currently just 1% of the total.

- 620 million people (68%) in sub-Saharan Africa do not have direct access to electricity. Even those who are grid-connected often have to endure blackouts. As a result, significant grid strengthening or expansion is needed to accommodate new generation projects;

- Electricity costs are higher than in other continents. Many countries in Africa depend on oil-fired generation, or on inefficient old coal-fired thermal plant. Transmission and distribution losses outside South Africa average 18%, due to inadequate and poorly maintained grid infrastructure in many countries. Average tariffs in sub-Saharan Africa are approximately 170% of Latin American, Eastern Europe and East Asian levels.

- High tariffs lead to genuine questions of affordability for governments and consumers, with many unable to pay the full costs and governments consequently having to provide tariff subsidies (currently 1.4% of sub-Saharan GDP). However, better off consumers (especially businesses) provide evidence of willingness to pay higher prices for reliable supply, as measured by the cost which they are willing to pay for back-up generation (usually diesel-powered).

For privately funded renewable energy power projects to demonstrate their value - and to encourage governments to create renewables procurement policies and programmes - their levelised cost of electricity must be competitive with alternative sources of new generation, and be lower than the marginal price that consumers are prepared to pay.
Investor requirements

What levels of return are required by investors in renewable energy projects in Africa?

Required returns on energy projects in Africa must reflect high sovereign credit risk, higher levels of political and regulatory risk than are prevalent in more established infrastructure investment markets and greater exposure to economic shocks as reflected in foreign exchange rate risk and inflation. They also have to reflect a lack of liquidity in financial markets: other than South Africa, few countries have liquid local currency markets – a pre-condition for solely domestic local currency project financing. For example, Nigeria has commercial banks which can underwrite large amounts (and are reported to be participating in the Azura Power gas-fired IPP US dollar financing), but typically only lend out to about 5 years in Naira; and few countries have either large private institutional investors or (as in Morocco) sovereign wealth funds with sufficient capacity to make long-term investments into projects. Consequently, investors in project equity will have a narrower range of options for exiting their investments than is the case in other markets – so project equity is likely to have to be held for longer periods by project sponsors, private equity funds and specialist African infrastructure funds.

For many other countries in Africa with less established renewable energy programmes, local currency funding will not be an option and funding in USD or EUR will be more likely.

With one of the highest credit ratings in Africa, deep financial markets and an established renewables investment programme, South African project equity returns are likely to sit at the lower end of private sector equity returns in African renewables projects. Mazars’ analysis of tariffs and target IRRs bid in successive rounds of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) shows that stiff competition has reduced target leveraged equity IRRs (in Rand) from around 20% in early bid rounds to much closer to 15% today – 7.1% above South African government benchmark bond yields. This premium to the risk free rate for renewables leveraged equity risk is within the range that prevails in larger European markets and reflects the benefit of deep long-term capital markets.

For many other countries in Africa with less established renewable energy programmes, local currency funding will not be an option and funding in USD or EUR will be more likely. In such cases equity returns would be likely to reflect the country’s sovereign borrowing cost in foreign currency (for the sub-investment grade countries listed above, perhaps 6% - 8% in US dollars reflecting general country political and economic risk), plus the premium for ‘normalised’ renewables equity investment (as has been achieved in South Africa), plus an additional premium to reflect illiquidity and lack of track record in renewables or IPP project investment in that country (cf. South African equity IRRs previously having been around 5% higher than current levels). Taking these components together, even for investment in lower-risk renewables sectors such as solar PV, required leveraged equity returns in USD or EUR in many African countries need to be in the high teens or low-mid twenties to attract foreign private investors.

Making renewable projects competitive

So how can affordable supply be achieved while allowing investors to make their required returns?

To meet investor’s return requirements and to allow for proper maintenance and reliable operation, privately funded new renewable energy projects will require a tariff which the government and utilities will claim is higher than current tariffs, and therefore unaffordable. However in many such
cases in Africa generation tariffs are frequently set at levels which do not allow generators to fully recover costs, even for maintenance, and still less for capital replacement. Moreover, where consumer tariffs are subsidised and existing supply does not meet demand, new privately funded capacity will cause the required government subsidy levels to increase.

To overcome these obstacles, new projects must make their case on the basis of net economic benefit. They must demonstrate that they are cheaper than the marginal cost of supply from alternative sources, which, in a network with endemic load-shedding, equates to the cost of back-up supply. In off-grid or grid expansion cases, the project’s levelised cost of electricity needs to be lower than the wider economic and social benefits of access to electricity for the end-user. For industrial users, self-generation brings reliability of supply and cost certainty.

To realise these benefits, projects must include in their scope measures which ensure these benefits are achieved, or else projects must be part of a programme where such measures are addressed separately. As a result, for generation projects to succeed, there will often need to be associated investment in the grid and in network operations, commercial management and implementing cost-reflective pricing policies. The potential gains which the project developer and investors can share in are large: the IBA notes that each $1 of power sector investment adds $15 to GDP, and outages cost African business 4.9% of annual sales. The challenge is to create structures which match payback for the project to the realisation of the user benefits, and which can capture those benefits to secure revenues for the project.

**Structuring the project**

*How can robust outcomes for sponsors and funders best be achieved?*

**Grid-connected projects**

Typical independent power projects (IPPs) comprise the construction and operation on a build, own, operate basis of the generation plant and (as part of the IPP or as separate works carried out by the utility) connection to a grid-connected substation. Providing that a country has enacted laws allowing power to be generated and evacuated to the grid by private entities, it is possible for the project to enter into a power purchase agreement (PPA) to sell its electricity - typically to the state-owned electricity utility or other government agency. Countries which have previously implemented thermal power IPPs can develop renewables-specific PPAs relatively simply; while other countries can adapt PPA templates from elsewhere to their own circumstances – but keeping broadly to established PPA risk allocations which sponsors accept and which are bankable. The PPA and related government direct agreement can also be used to ensure that any fiscal benefits conferred on the project – such as tax exemptions, import duty reliefs and so on – are passed through to the offtaker in the form of reduced tariffs.

However, even these ‘straightforward’ grid-connected renewable IPPs projects require close co-operation between the project developer and the authorities and offtaker to ensure the robustness of the project. Sponsors must ensure that the authorities are taking the necessary steps to ensure that transmission and grid infrastructure will be sufficient for evacuating their project’s output, and that electricity pricing policies are such that the offtaker has sufficient financial stability to allow it to commit to paying the renewable IPP’s tariff over the life of the project. Properly structured PPA contracts can deal with some of these issues, such as for example, allowance for grid unavailability up to a certain amount of output per annum (as in the South African REIPPPP Programme), measures providing currency exchange protection on tariff payments (as in recent IPPs in Ghana), and credit support of the offtaker’s payment obligations (e.g. in the Ugandan GET-FIT pro forma PPA). However, contractual measures are no substitute for good project preparation to ensure the project is robust from the outset and can be delivered on time. These issues can affect even very well structured and proven renewables procurement programmes such as the South African REIPPPP: where projects which were awarded preferred bidder status in November 2013 under Round 3 have yet to achieve financial close one year later. Despite bank credit committee-approved term sheets at bid stage, and market-accepted PPA and Implementation Agreement
terms, project signings have been delayed to ensure that necessary grid upgrades are ready for the REIPPPP projects’ commissioning dates.

**Industrial off-grid projects**

Likewise, off-grid solutions give mining and industrial users greater reliability of supply at a known cost, improving their operating efficiency. In such cases, the renewables project developer and funders will need to have confidence in the long-term prospects for that mining or industrial site, and so obtaining guarantees of the tariff payment obligations from a creditworthy group parent company is necessary. If these conditions are met, then the project can be structured similarly to grid-connected power, with the industrial user being the PPA counterparty instead of the utility company or other government agency.

**Mini-grids and grid expansion – the case for concession structures**

As noted above, for projects which give access to new consumers the challenge is to create structures which match payback for the project to the realisation of the user benefits, and which can capture those benefits to secure revenues for the project. The issue in such cases is that too many of the factors which will make the project successful are outside the control of a generating business alone. The project company has to expand its remit to ensure its output reaches end-users so that they achieve the economic benefits that enable them to pay. In effect, the project company becomes the supply company, controlling and maintaining the local distribution network and putting in place tariff collection measures including, for example, pre-pay meters. The mini-grid (or series of mini-grids) could comprise, for example, PV solar with a degree of backup generation, which if provided on a centralised basis within the mini-grid may prove more cost-effective than individual business- or household scale generating sets. To ensure proper public oversight, the arrangement could be governed by a concession agreement which included the permitted tariff structures and any government subsidies thereof; possibly government or national utility underwriting of some of the collection risk, and performance standards on the project company. Mini-grid concession programmes are already being developed in countries such as Senegal, Mali, and Kenya.

**Making projects financeable**

There is evidently strong but cautious interest from institutions and banks to fund viable new power projects in sub-Saharan Africa. This is shown by recent progress in renewables, and in large scale oil- and gas-fired IPP transactions such as the recent Cenpower project in Ghana, the Azura Power project in Nigeria. These IPP transactions successfully attracted a mix of international commercial and development bank debt, and publicly and privately funded sponsor equity.

While deal structures in power projects in Africa can be expected to follow the IPP or concession financing route, some aspects require specific attention to avoid unnecessary delays to the project:

_Devolution financial institutions (DFIs) help get projects funded…_ Early engagement with DFIs is likely to be vital. Having to reconcile required investor returns with user affordability, and to deal with political and regulatory risks and weak PPA counterparty means that in the majority of cases DFIs such as the AfDB, World Bank/IFC, DBSA, EIB, KfW, FMO etc need to get involved to help governments prepare projects and programmes for procurement properly. They also need to participate in the funding. Also, commercial lenders and financial equity investors will be likely in most cases to require DFI co-financing as a condition of credit or investment approval (they are also likely in many countries to require export credit cover for their loan facilities).

**“**

_DFIs welcome co-lending on a project basis alongside commercial banks. As an alternative to bilateral sovereign loans they value the due diligence processes and commercial evaluation that banks apply._

As well as term debt facilities DFIs also offer other specific facilities and support that will help projects to become financeable. These include providing technical support to aid project scoping and feasibility studies, and to make policy recommendations to remove subsidy and other distortions that result in financially weak and underfunded utilities that require supplemental credit support to act as PPA counterparties. Some of these are specifically targeted at addressing power project issues: for example, in the Uganda GET-FIT renewables programme, the World Bank is offering partial risk guarantees to back letters of credit covering tariff payments from the state-owned utility, and bidders may apply for support (funded by KfW) for early stage transaction services. Likewise, the recently launched Green Africa Power facility (to which the UK government has committed £98 million) offers a mezzanine debt facility with a ratcheted interest rate structure, to allow renewables projects to offer lower tariffs in the early years of the project, to ease affordability concerns.

_… but their requirements and decision-making processes can be time-consuming_

DFIs welcome co-lending on a project basis alongside commercial banks. As an alternative to bilateral sovereign loans they value the due diligence processes and commercial evaluation that banks apply. However, notwithstanding commercial bank due diligence processes, DFIs also require detailed feasibility, affordability, and value for money studies, and social, economic, and environmental impact assessments. They may also require reviews of development costs incurred, to ensure that payments have been appropriate and necessary for the project. They will
also insist on procurement processes that are transparent and competitive – a feature which creates difficulties for ‘unsolicited proposals’, whereby sponsors seek to negotiate project awards outside of standard tendering procedures. All these requirements take time, and so sponsors must take care to ensure that these processes are carried out while they are bidding or negotiating to reach financial close.

Managing interest rate and foreign currency risk

Early negotiations with government and state-owned power companies also need to establish the required allocation of interest rate and foreign currency risk to make the project fundable. As noted earlier, outside South Africa, local currency capital markets in sub-Saharan Africa are not sufficiently deep to offer project finance in local currency. This means that projects of necessity will find that either interest rate or currency risk (beyond the construction phase) cannot be hedged in the market, and thus will likely have to be covered by way of PPA tariff adjustments. In countries (such as Nigeria) where short to medium term local currency finance is available, project debt facilities could be local currency denominated, but since long term swaps are unobtainable, the tariff would require adjustment for any movement in the market base rate, to insulate project cash flows from interest rate risk (such a mechanism has been used, for example, in Jordanian renewables financing). In other countries where there is insufficient depth in either the short or long term capital markets, foreign currency funding would be required and it is likely that either the PPA tariff would need to be expressed in a foreign currency, or else be fully adjustable for exchange rate risk (including in relation to delay in making foreign currency available to the offtaker for payment).

Conclusion

The scale of the opportunity for developers and investors in renewables in sub-Saharan Africa is great. The opportunity is far wider than developing and operating discrete grid-connected generation projects – in many cases the project or concession scope will have to be expanded to cover more of the power supply chain to the end consumer, to include distribution and commercial management, as well as off-grid and mini-grid solutions. To realise this, developers and investors need to spend considerable time in understanding the wider context of their projects and in engaging with governments and DFIs to ensure that project preparation is comprehensive. As a result, sponsors’ business models will have to be more flexible, to give them the capability and credibility to promote, develop, and attract capital to these economically and socially vital projects.

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Mazars is a global audit, tax and financial advisory firm with offices in 72 countries including 22 in Africa. We combine local market knowledge with energy sector and project finance expertise, with over 60 Project Finance professionals in London, Paris, Johannesburg, New York, and Delhi. Mazars provides project finance advice, valuation, modelling, model audit, transaction support and due diligence services to project sponsors, funds and banks in infrastructure/PPP and energy transactions throughout EMEA and the Americas.

About the author

David is Director of Project Finance – renewable energy at Mazars LLP, where he leads the project advisory services for the renewable energy and power sectors. He has over 20 years’ project finance experience. Since joining Mazars in 2009, he has worked on a range of PV and CSP solar, wind energy (onshore and offshore), biomass, non-renewable thermal power and water sector transactions in a number of European countries, South Africa, Ghana, Namibia, and Morocco, and Jordan, for major project sponsors, investors, and banks. David’s experience both as an adviser and as a lender has given him a deep knowledge both of the renewable energy sector and of the mind-set of investment committees and lenders, backed up by a broad range of relationships amongst sponsors, funders, advisers and other players in the above markets.
Renewable power offers immediate economic power solutions for Africa

In sub-Saharan Africa today, renewable power can help increase the availability of power and reduce its marginal cost. The environmental benefit of renewable power is valuable but in this case, a responsible power solution is what’s key.

Africa: Ideal for renewable power

Much has changed over the last ten years or so since the renewable power boom began. At the start of the boom, renewable power costs were very expensive and high quality developers were hard to find. Many of the European renewable incentive programs, which have been much maligned, are now paying dividends beyond the European continent. Good core development expertise is available and capital costs have dropped dramatically. Globally over the past five years, the levelized cost of energy (LCOE) has dropped by over 78% for solar and 58% for wind, driven largely by a decline in capital costs and technological improvements. While nascent markets in Africa are more costly than their European counterparts, the cost of new renewable power on the continent is still very attractive and benefits in many instances from access to excellent renewable resources, including solar, wind and hydro.

As outlined on the following page, on balance African countries and some interior sections in particular, benefit from wind capacity factors of 40-45% and hydro resources are plentiful, in particular, across East African countries.

1 “LCOE” or “Levelized Cost of Energy” is the power price (currency/MWh) that must be obtained to earn a level of return (stated IRR), taking project capital cost and annual operating costs into consideration. It is effectively the price of power a generator must charge its end users to achieve an economic profit.
2 Lazard estimates
3 BioTherm Energy
Certain renewable power plants can also be deployed very close to load, alleviating the need for long transmission lines that plague many large thermal power plants. Solar in particular can be built very close to load. Furthermore, solar projects do not need major infrastructure to support rail, pipelines or continuously maintained roads for fuel deliveries that are normally required for large thermal power plants.

Finally, many renewable power plants (e.g. wind and solar) can be built quickly. A 50 MW solar project can be built in six to nine months from financial close helping to bring power very quickly to the grid. Such plants provide near term power solutions compared to large fossil fueled power stations that would still be in final development or construction over the same time frame. Given the immediate need for power in many parts of Africa, renewable power plants provide a much more immediate solution to power reliability than traditional power sources.

### Helping to bring down costs

All these positive benefits for renewable power should be set against a backdrop of diesel-fired power on the margin at a cost $200-$300/MWh higher than the price required to make renewable power possible in most instances. Such renewable plants can be built quickly, mitigate blackouts and reduce the cost of power in most instances without the need for subsidies.

Off-grid solar projects can also be integrated with diesel projects to help reduce power costs for mining operations or other industrial processes which have their own captive power sources running on diesel or heavy fuel oil (HFO). Integrating renewable power technologies with diesel/HFO power allows for a steady state operations while reducing the cost of power generation and reducing pollution.

### Market Size & Growth

According to the World Bank, only 24% of the population of sub-Saharan Africa has access to electricity versus 40% in other low income countries. Excluding South Africa, the entire installed generation capacity of sub-Saharan Africa is only 28 GW, equivalent to Argentina, which has a population less than 5% the size of sub-Saharan Africa (~900 million excluding South Africa).

Economic growth rates vary by country within sub-Saharan African, although many countries have sustained 5-6% growth rates for more than a decade, with this trend expected to continue in the near future. Electricity demand will increase at rates higher than economic growth as energy use per capita increases from extremely low levels today. Recent studies note that energy demand in Africa will grow from 590 TWh in 2011 to 3,100 TWh in 2040.

The demand for new power generation is immediate. The picture below provides another lens through which to examine the situation. One can easily see the US and Europe while Africa for the most part is dark. This situation needs to be rectified.

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4 International Renewable Energy, “Prospects for the African Power Sector”. Diesel generation can cost as much as ~$400/MWh.
5 The World Bank, The Government of South Africa
6 IMF 2014 Sub-Saharan Africa Regional Outlook
Execution is the key

The key to realizing the opportunity is execution. Companies led by management teams who understand both the technical aspects of power development and the different sensitivities by country, and regions within countries, will be the most successful. The right team provides the best frontline defense for issues that might arise.

Project finance in most of Africa also requires a special skillset to understand how to put the “extra pieces” together, which makes the project bankable and investable for an equity participant.

Individuals must have the basic development skillset, understanding how to stage capital properly through the different derisking events in development (e.g., permits, interconnection, PPA), but they must also be able to read the political landscape and cultural sensitivities. Pushing forward a project that doesn’t have support from every aspect of a country’s energy sector, from the local community to the minister of energy, might mean a very long development period and lots of wasted development capital.

Project finance in most of Africa also requires a special skillset to understand how to put the “extra pieces” together, which makes the project bankable and investable for an equity participant.

Attributes of a bankable project

For any power developer in emerging markets, certain investment requirements must be attained for a project to be viable. Across all of Denham’s portfolio companies we approach deals in a very systematic manner. Our first action, as highlighted above is to select the best teams, which we have in our Africa focused portfolio companies, Endeavor Energy, FRV and BioTherm Energy. Next, we assess projects against a specific criterion, which include, but are not limited to:

- Assuring a project can provide an affordable solution to its customers (lower marginal cost vs. other generation sources);
- The country where the project is developed has a clear and transparent regulatory framework or such issues are clearly dealt with under the PPA or government support agreements;
- Strong local and national support for the project which will help ensure multiple parties in the country are aligned around such power solution;
- The project can obtain a long term US or Euro denominated PPA, or is priced in a country with a liquid and relatively stable currency;
- The project can attract non-recourse project finance debt;
- Proper counterparty credit risk mitigation, such as World Bank guarantees and where appropriate, political risk insurance is available; and
- The project can attract bankable turnkey fixed price EPC solution with reputable EPC contractors.
What we see is that African projects which have met our criteria as outlined noted above have not experienced complete failures. The failures perceived by many actually relate to development projects which never fully reached financial close and/or were put together in a “high risk” fashion. What lacked in most of the larger failed developments was an experienced and well capitalized team who didn’t properly capital stage their development costs. Not all power developments (in Africa, the US or any market) will reach financial close, but the key is minimizing the amount of equity capital at risk prior to material de-risking events, such as attaining a bankable PPA with any requisite credit support.

One thing helping to move projects forward in Africa is US President Obama’s Power Africa initiative. Through this program the US government has mobilized multiple agencies (e.g., USAID, OPIC, US ExIm, USTDA) to help projects through development, accelerate financing and provide credit enhancements where needed. This program is not a silver bullet for power projects but is one additional support mechanism to realize African power projects.

**South Africa Story**

In 2011, South Africa introduced its Renewable Energy Independent Power Procurement Programme (“REIPPPP”) so that the private sector could begin providing power solutions for the country. To date, the program has delivered 2,460 MW of power generation capacity at a weighted average power price of ~$163/MWh for wind and solar power7.

One of Denham’s portfolio companies is South Africa based BioTherm Energy, an Africa-focused wind and solar project developer and operator applying world-class development standards. BioTherm is led by a local management team with over 100 years of international power experience and a deep network across the continent. The company operates 2 solar PV and 1 wind

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7 South Africa Department of Energy. Capacity and tariffs stated is based on MW awarded in REIPPPP Rounds 1 and 2.
projects, totaling 49 MW which it developed, built and is now operating.

BioTherm has taken its success in South Africa and is now applying the key principals noted above for power development outside of South Africa. To date, the company has secured PPAs in Zambia, Burkina Faso and Senegal, and actively pursuing projects in West, East and the rest of Southern Africa.

Endeavor is developing hydro projects on the continent and also considering situations where it can partner with firms like BioTherm and/or FRV to bring quick wind or solar solutions to the regions where its projects will not be operational for several years.

Global expertise, local execution

Some of the lesser developed power markets across Africa can benefit from global experience until the market is fully developed and world class talent can be found locally. In the undeveloped markets, companies like BioTherm can help bring world class experience and partner with local companies.

Denham’s global solar platform Fotowatio Renewable Ventures (FRV) also brings solar development experience from Europe and the US to help drive the least cost solutions for Africa. It has financed nearly $2 billion of projects by partnering globally with the largest EPC contractors to deliver the highest quality projects. This expertise can be translated into local African markets with good local partners.

Denham’s third portfolio company focused on Africa is called Endeavor Energy. Endeavor is focused on thermal and hydro power developments, and brings global expertise to local markets. Endeavor is developing hydro

projects on the continent and also considering situations where it can partner with firms like BioTherm and/or FRV to bring quick wind or solar solutions to the regions where its projects will not be operational for several years.

The future is bright if we make it that way

The opportunity for renewable power in Africa is in front of us all today. Renewable power can be part of the near term and longer term power solutions for the African continent. With continued improvements in enabling renewable power and the right groups to execute on projects, we are hopeful that the world at night picture shown above will start to show Africa with more of the glow it deserves.

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Denham Capital is a leading energy and resources-focused global private equity firm with more than $7.9 billion of invested and committed capital across seven fund vehicles and offices in London, Boston, Houston, São Paulo and Perth. The firm makes direct investments in the energy and resources sectors, including businesses involving power generation, oil and gas, and mining, across the globe and all stages of the corporate lifecycle. Denham’s investment professionals apply deep operational and industry experience and work in partnership with management teams to achieve long-term investment objectives.
The risk of developing renewable energy in sub-Saharan Africa

Investor risk aversion is holding back renewable energy investment in Africa. With only one in three sub-Saharan Africans currently having access to electricity, it comes as no surprise that renewable energy has been identified as desirable. Flexible, clean, sustainable and diverse, bespoke renewable energy developments are already transforming lives, particularly those in remote areas where centralised forms of thermal power such as coal or gas would be impractical. Despite this, and despite the abundance of natural resources available, Africa attracted only $6.2 billion of the $239.5 billion invested worldwide in clean energy in 2013.

This is a situation that urgently needs to change in order to meet the energy demands of a growing population. As a relatively new market spanning a variety of geopolitical environments, development in sub-Saharan Africa comes with its own unique set of risks. To mobilise higher investment, government and industry must provide the necessary regulatory frameworks to lower investment risk. While some of these risks bring to mind Donald Rumsfeld’s ‘unknown unknowns’, actions can be taken to ensure that developments progress as planned, and crucially, are financially attractive to investors and considered bankable by lenders.

In this article, I will discuss the major risk areas, and in turn, how risk may be mitigated, based on the real-world experience SgurrEnergy has gained working across the continent on a variety of renewable energy projects.

WHAT MAKES A GOOD SITE?

Careful site selection is crucial, and thorough research and planning here will go a long way in reducing the risk and uncertainty of the project as a whole. To avoid underperformance, the following considerations are vital:

Site resource

For wind sites, feasibility studies should be commissioned measuring wind speed, shear and turbulence, ideally at several different locations and heights within the proposed site. For example, on a recent project in Malawi undertaken by SgurrEnergy, two SgurrMetMasts were installed. Data is collected once a year for analysis to ensure the site chosen...
is fully optimised for the candidate technology. For solar developments, solar radiation and general weather patterns must be measured on-site for at least a year; the more data available, the lower the uncertainty.

**Site size and characteristics**

Site size and characteristics, such as ground conditions, determine, in conjunction with the site resource measurement, the potential capacity. For solar sites, issues surrounding seasonal shading must be evaluated.

**Site access**

The following considerations are essential:

- Is the site optimally positioned for accessibility?
- How will the site be supplied; does road access require permission from a different land owner, resulting in monies being paid?
- Is access to and around the site via a solid cut or floating road?
- Can equipment and machinery be brought to the site easily?

Transport and access risks must be determined early on and it must be clear who will take responsibility, and therefore the risk, for ensuring timely delivery of supplies.

**Access to grid**

For developments where electricity will be exported rather than used by an associated development, grid access uncertainty and associated cost are key factors in determining if a project is commercially viable.

**Social and environmental impact**

Could the development disrupt or potentially inflict damage or harm to the surrounding environment, taking into account both the local human and wildlife populations? If so, it is important to look at how this can be avoided or mitigated.

**Predictable and high power prices**

Tariff and pricing mechanisms are country/region specific so ideal sites will be located in areas with favourable regulatory mechanisms, with or without high wholesale electricity prices. Other regulatory factors such as taxation, rule of law and political stability should also be considered here.

**CONSTRUCTION RISKS**

The supply chain holds the most prominent source of construction risk, making due diligence vital. The financial strength and track record of contractors can vary widely, and it is important to distinguish whether the best contractors and technology are being employed, or whether compromises are being made. Contractors must be able to rapidly ramp-up activity levels if required, without running into delivery and quality issues.

Naturally, even well-developed projects still contain risks and therefore it is always advisable to consider what schedule, contingency and contractual mitigants are available. For example, on a recent sub-Saharan project undertaken by SgurrEnergy, construction was unavoidably affected by weather windows and supply chain delays, however contingency planning ensured budgets were not compromised, and the project proceeded without significant delay.

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**Figure 1: Project development risk-return process**

Source: SgurrEnergy
Site permits

Site permits are not a ‘tick box’ item - they are more complex than many parties realise, and missing the smallest of details could set the project back by months. Permit conditions must be fully understood and built into the project to ensure full compliance.

In particular, land owners’ rights can be complex, especially when multiple parties can claim ownership. This can cause difficulties when trying to define the beneficiary community and when designing the community benefit structures to which revenue will be channelled, potentially necessitating further identification of beneficiary community boundaries based on social, geographical or demographical factors.

Ground risks

Developers typically gather large volumes of site data; however these are not always properly analysed, leading to unexpected additional costs during construction. Designing problems out before construction begins is far more cost effective than acting at construction stage, therefore a preliminary site visit and thorough due diligence is essential.

Grid connection offer

Establishing a definite grid connection offer and connection date is critical. Grid code compliance is complex and grid availability across sub-Saharan Africa varies dramatically. Developers must ascertain whether the grid has the capacity to accommodate the fluctuating load typical of renewable energy sources. Finally, and crucially, independent power producers ordinarily bear the cost of grid expansion and connection.

Insufficient resources

Project developers often suffer from insufficient human and capital resources which, when faced with unexpected delays, can result in them being forced to sell or abandon the project.

Construction-phase work activities are particular trouble points, and balancing project management and the needs of the financing process can hold up projects at almost any point in the development process. This can often be attributed to a lack of detailed understanding of the project finance process on the part of the multiple contractors.

Understanding the lender’s perspective

A growing, relatively nascent industry will inevitably feature some developers with little or no experience of securing project finance from banks. Lenders generally take a very granular and phased approach for renewable energy investment and therefore developers should be prepared with a thorough, fully risk-mitigated project delivery programme. Problems arise from lack of experience in developing and operating renewable energy projects, which leads to the setting of unrealistic timescales, in addition to forecasting inaccurate capex and opex budgets.

A sufficiently detailed and thoroughly reviewed proposal can help to mitigate these potential risks. Full stakeholder engagement must be achieved and all project requirements well documented. Failure to consider advice from consultants engaged by either the lender or the developer can result in delays.

Contingency

Contingency is a defined amount of time and budget held in reserve to mitigate unexpected costs. With a contingency reserve, the project developer can react to unexpected changes flexibly throughout development. That said, contingency reserves increase the overall project costs if drawn upon and impact the project funding requirements.

While benchmarking has traditionally dominated contingency sizing, local market knowledge and past experience typically provide the most robust contingency level for a project, combined with a strong Quantitative Risk Assessment approach.

Quantitative Risk Assessment (QRA)

QRA quantifies the combined effects of all uncertainties on the project objectives, and is considered best practice for sizing cost and schedule contingencies for large projects, allowing for incorporation of both risks and opportunities, along with general uncertainties.

The consequences of project uncertainties can be most usefully estimated using Monte Carlo simulation techniques, an established statistical methodology functioning as a scenario generator. Each iteration represents a potential project outcome. The repetition of this calculation is the key strength of the Monte Carlo simulation technique, but it is very important to note that the success of the technique depends heavily on user
experience, company culture, risk register integrity and assumptions made during simulation.

Approaches to risk management are continually evolving and in recent years the adoption of best practice risk management techniques has significantly increased. SgurrEnergy believes that take-up of best practice risk management has significantly aided renewable energy projects in informing contractual strategy, cost-benefit and risk mitigation decisions during the project development phase, and has also allowed more effective communication of time and cost risk during the construction phase. QRA has widely benefitted project stakeholders and financiers and therefore uptake is already a fundamental focus of due diligence activities. It is likely to become a core requirement for project lenders and financiers in future.

In figure 1, you can see a summary of the project development risk return process, and figure 2 outlines the key risks to be identified during the process and the necessary steps to be taken to mitigate these.

**OPERATIONAL RISKS**

Operational risks impacting performance, revenue, maintenance costs, and the commerciality of the project include:

- Change to the major assumptions used in feasibility studies
- Change to resource availability e.g. through development activity nearby
- Change to the tariff/pricing, regulatory or taxation mechanisms
- Issues in the maintenance supply chain
- Higher than expected equipment failure rates
- Capability and experience of the operators.

Investors will demand comprehensive justification for the technology selected, requiring guarantees such as energy yield predictions, analysis of project design life, technology risks, and O&M strategies. State-of-the-art techniques should be employed when modelling; high production uncertainty will reduce the available debt a project can attract.

> Many African utilities are state owned and as such may not have sufficient funding in place to provide capital for renewable energy, and may not have the credit worthiness to act as a power purchase off-taker from independent power producers.

**REGULATORY AND POLITICAL RISK**

Political risk is an additional concern for investors in sub-Saharan Africa, who will require that target countries demonstrate stable economic policy drivers to stimulate project development and can allow for payback within 10 years. Regulatory risk is very difficult to mitigate, as evidenced by the clear correlation to the level of renewable energy penetration in the overall power mix.

Furthermore, power sector reforms are slow, maintaining a status quo favouring traditional centralised fossil fuel power generation, placing a secondary consideration on renewable energy development and the benefits of liberalisation, decentralisation and increased competition.

Many African utilities are state owned and as such may not have sufficient funding in place to provide capital for renewable energy, and may not have the credit worthiness to act as a power purchase off-taker from independent power producers.

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2 Financing renewable energy in developing countries – UNEP report – February 2012
Political uncertainty can also impact exchange rates, frequently resulting in the devaluation of assets financed by foreign invested capital. Moreover, investors may consider the available regulatory regimes as immature and legally insufficient. Investors, already nervous due to the precedent of untimely government intervention in the mature markets of Europe, are reluctant to invest where levels of subsidy are particularly high.

A local partnership can mitigate these risks, however, as always, due diligence should be carried out on their suitability.

CONCLUSION

The rewards for investing in Africa can be high, and although assessing the risks is a daunting task requiring expert assistance, numerous developments have already been successfully commissioned in the region. SgurrEnergy has been assisting companies to mitigate the type of risks discussed in this article for over 12 years, providing expert support and advice to developers and investors in new and challenging markets. The potential for renewable energy development in sub-Saharan Africa is enormous and with continued investment in risk mitigation, meticulous planning and thorough due diligence it promises to become a major player on the world stage.
Banking a renewable energy deal

As one of the commercial banks to fund a significant number of renewable energy projects in South Africa’s hugely successful renewable energy programme, Rand Merchant Bank (RMB) discovered that many of the project promoters were fairly new to the arena of power projects and raising debt through project finance. And because renewable energy projects were new in South Africa, both international developers and local participants were operating in unexplored territory.

But the South African market has developed quickly and significant progress has been made by all market participants to understand how to interact and achieve successful outcomes in the sphere of renewable energy project finance. From the perspective of a local commercial bank, the following basic tenets of project finance now seem to be understood and sponsors who approach the banks tend to request funding for robust bankable deals. The general rules are now recognised as follows:

- Understand the nature of commercial banks and what they do. Their ultimate aim is to protect and manage their shareholders’ money. A commercial bank’s lending team will attempt to mitigate all perceived risks in a transaction in which there is no real security, other than a stream of cashflows, and no financial recourse to the shareholders of a project. For project finance, senior debt is viewed by lenders as a zero loss game and banks will not take on more risk than they are accustomed to. Sponsors who ask the bank to come up with say 75% of a large sum of money, should expect a high level of due diligence to secure the financing;

- Sponsors increasingly approach the bank with a fully baked project, not merely a vision that needs development capital with several unticked boxes. The senior lenders are generally the final player in the realisation of a vision and will welcome projects in which all permits and authorisations have been obtained and suitable partners selected;

- Sponsors are increasingly willing to listen to banks, and trust that they have the project’s interests at heart. There will of course be negotiations and disagreements between the bank and the shareholders as to who should be taking which risks. But no-one wins if a deal doesn’t close due to a stalemate or runs into financial difficulty because the structure is not resistant to unforeseen challenges.

When evaluating projects that are presented to the commercial banks, a wish list is assessed and considered as a prerequisite to embarking on financing discussions. One of the most critical items on the list is an engineering, procurement and construction (EPC) contractor with a track
Though leadership record and the financial strength to stand behind their obligations in the construction contracts. The importance of building a plant properly is fundamental to success, considering the length of time each project is expected to operate.

The successful South African renewable sector has now become extremely competitive, and the ambitions of project developers are turning northwards to the rest of Africa. Although there are still no formal programmes of the scale of the South African renewable energy programme on the rest of the continent, renewable energy is nevertheless very bankable.

The shareholders are obviously important and similarly, track record and financial strength are vital considerations. The shareholders’ approachability and expertise is also helpful. Can sensible discussions be had if there is a need to sit down and work things out some time in future?

Although the intensity of energy such as irradiation or wind speed is important for achieving low tariffs, it is not crucial for banking the project. The resilience of the project to downsides is far more important to funders and often depends on financial metrics and revenue downside tests to determine whether the project will survive if something goes wrong, or if the resource proves to be less than anticipated. The “stranded asset” scenario is a key concern as funders ask who will buy relatively expensive renewable energy if the project’s original government-backed power purchase agreement is terminated.

Renewable energy projects have attracted low-cost, long-term debt due to government involvement and creditworthiness of the offtaker. Terms of this funding have become increasingly beneficial to project sponsors as more projects are delivered and lenders become more comfortable with the risks. These factors have also led to the reduction in required equity returns from investors in these projects and technology improvements and increasing competition have led to lower EPC prices.

The successful South African renewable sector has now become extremely competitive, and the ambitions of project developers are turning northwards to the rest of Africa. Although there are still no formal programmes of the scale of the South African renewable energy programme on the rest of the continent, renewable energy is nevertheless very bankable. However, the creditworthiness of the offtaker remains a key consideration for lenders and investors.

If other African countries wish to replicate the South African success, enabling frameworks with government support will go a long way to achieving their renewable energy aspirations.

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Rand Merchant Bank (RMB), a division of FirstRand Bank Limited is a leading African corporate and investment bank and part of one of the largest financial services groups in Africa. We offer our clients innovative, value-added advisory, funding, trading, corporate banking and principal investing solutions to deliver on our business philosophy and brand promise: Traditional values. Innovative ideas. We have subsidiaries in the UK, India, China, and the Middle East and access to retail banks in 25 African countries.
The challenges of financing renewable energy projects in Africa

Clean Energy Pipeline interviewed Eric McCartney, Executive Director, Chapin International, to understand the unique challenges of financing renewable energy projects in Africa and how the many obstacles to financial close can be overcome. Chapin International has executed transactions with a value in excess of $3 billion. It provides due diligence, commercial development and financial structuring assistance to ensure the bankability of projects in challenging environments. Its core area of expertise is infrastructure projects in Africa with a particular focus on renewable energy.

What are the unique challenges of developing and financing renewable energy projects in Africa?

Working with the multilaterals and development bank financing institutions, which have much different requirements than commercial banks, is probably one of the biggest challenges. There is still a lot of corruption which is a real no-no for these banks. You cannot give away an interest in your project to a political figure, for instance, or anyone who is connected with a political party.

Most of the time banks will do a KYC (Know Your Client) analysis when evaluating financing a project. This is almost a criminal investigation into all of the people who are involved in the financing and the development of the project to make sure that they don’t have any negative political ties and that they haven’t been involved in fraudulent activity in the past or corrupt processes. Banks look at this very closely so you need to be careful about what you do and how you do it.

You also need to spend the time researching the law in the country you want to develop projects in. Some developers go into countries and don’t do any research. When I first spoke to my client in Senegal, for example, they were not even aware that they were outside of the law and that they could not develop a project without firstly selling to Senelec, the national electricity company. Secondly, they couldn’t sign a PPA with Senelec unless they were subject to an international tender. If you understand the challenges upfront you can assess the risks or you can go to the government and ask them if it is possible to do a project.

Also, you must have an extreme amount of patience. Working on a project for five or six years is not an unusual amount of time. As an example, I’ve been working on a project in Tanzania for two years but the project has been
in development for at least five years. It’s not an unusual amount of time in Africa.

There are also challenges related to financing. You can’t finance a project in Africa like you can in Europe. You can’t get 90% debt financing for a start. You can get a maximum of 70% financing, so a much bigger amount of equity has to come into the project. And the equity has much higher expectations as far as returns are concerned. Sometimes they have expectations that are too high so one of my jobs is also managing those expectations and making sure they understand what they can expect and what is realistic.

Who are the most active providers of debt financing outside of South Africa for renewables?

The most active lenders are the African Development Bank, DEG, the European Investment Bank, Proparco, FMO, Frontier Markets, which is owned by several development finance institutions, and the IFC. Export credit agencies and the World Bank are also fairly active.

How far are commercial banks from investing in African renewables?

They are far away. Local financing is sometimes available but it is either too expensive or they are only willing to lend for five or six years. Tenors are a real issue in project finance deals where you have to go out 15 to 17 years in order for the financing of the project to work. Local banks can typically not provide that kind of tenor.

There are products provided by organisations like Frontier Markets who will actually guarantee the tenor at the end of the six years. In other words they will guarantee the refinancing at the end of the six years. A bank cannot lend for more than six years, but at the end of those six years they will renew it for another six years. There are institutions which will guarantee or underwrite that risk to make sure there is financing available at the end of the tenor. There are structures that can be used to attract commercial banks but in the near term I don’t see any true commercial bank lending outside of multilaterals and bilaterals without very specific political risk coverage in place.

Where does Chapin add value?

There are certain things that banks or financiers will look for in all the documentation, whether it be an EPC contract or a government guarantee, or the PPA itself, or just the method in which the project has been developed. We make sure, for example, that when a client does environmental studies, they do it in a way that the bank wants. That also goes for PPAs. There are a number of things that banks will look at in a PPA that simply, if they’re not right, will have to be amended. In the end, what we do is get the documentation right the first time which can save a lot of time for the client.
Reaching financial close for South African wind projects
THE IMPORTANCE OF ANALYSING ENERGY RESOURCE AND ALLOCATING RISK IN PROJECT CONTRACTS

Achim Hoehne
Wind Prospect Africa (Pty) Ltd.

As the South African wind industry awaits the announcement of Round 4 preferred bidders, renewable energy experts Wind Prospect Africa continue to build out their market position. Since 2009, the Wind Prospect team has acted as Owners Engineer, Lenders Technical Adviser and Energy Yield Adviser for clients across the South African industry. While we have learnt the South African rules of business and industry, it is the experience gained in international markets over the last two decades that enables us to help clients optimise development, reach financial close, negotiate contracts, and successfully bring projects online.

The large number of bids at present shows the appetite for continued renewables development in South Africa. As the industry enters this exciting new phase, it is important to reflect on two key aspects for financing wind power projects - the diligent analysis of the expected energy resource and the allocation of risk in the project contracts.

Cost-benefit-analysis of measurement equipment

The selection of a suitable project site, the installation of resource monitoring equipment to confirm wind resource, and a project’s energy yield are key processes in early-stage markets. The mast’s location, height, sensors, and the use of additional remote sensing units (SoDAR, LiDAR) all impact on data suitability and uncertainty levels. An increase of the latter will typically result in increased debt cost and subsequently influence the commercial outcome. Three common scenarios are reviewed in considering different monitoring strategies - Figure 1 and 2.

Technical risk allocation

While the required full seasonal cycle of on-site data is being monitored and logged, project development including permitting, negotiating of off-take, and supply and service contracts can progress. Within this remit, the risk allocation mechanisms have converged towards providing protection to the owner against turbine failure or under-performance via three ‘pillars’.

The Defects Warranty as defined in the Turbine Supply Agreement (TSA) protects the project owner within the defects notification period. The first pillar of protection is given against repair costs during this period with a typical cap of 100% of the overall TSA price. However, owners should
Though leadership

Wind Prospect Africa (Pty) Ltd.

Wind Prospect has constructed over 130 projects globally, provided technical advice on over 30 GW, achieved consent on over 3 GW. Wind Prospect Africa, part of Wind Prospect Group, is active in South Africa and Kenya. Wind Prospect Africa has managed project construction of 130 MW, roles as Lenders Technical Adviser on 500 MW and Independent Engineer on 100 MW.

With over two decades of experience, our team of experts support organisations by providing essential services in finding, developing, building, operating, buying and selling renewable energy projects.

The next step in Wind Prospect's service offering to the maturing South African market is Operations/Asset Management where we currently hold contracts globally for 800 MW. We aim to follow the project lifecycle to expand this service in Africa in 2015.

Figure 1: Energy yield uncertainty

Figure 2: Indicative project cost and IRR

Turbine suppliers (OEM) can seek to limit the warranty by triggering the defects notification period of protection early in the commissioning phase and stipulating that only defects of which they are notified within the period are covered. Timely end of warranty inspections are recommended to ensure the owner is protected.

The TSA does not commonly provide compensation for loss of revenue for failure of the equipment supplied. Instead, under the Maintenance & Service Agreement (MSA), the OEM guarantees availability of the turbines up to a certain threshold (typically 95-97%) and pays Liquidated Damages (LDs) where this level is not met. This availability warranty is the second pillar of protection against turbine failure.

LDs for availability are calculated based on either actual or theoretical revenues. A common approach is to use the actual yield over the preceding 12 months, corrected up to warranted availability, and the market power price. LDs payable under the availability warranty will be capped annually or cover the duration of the MSA, generally to cover at least a 10% loss in availability. If linked to MSA fees, project owners must consider the connection during negotiations as a last minute reduction in price will reduce the level of LDs that may be claimed.

The third pillar of protection constitutes the OEM's duty under the MSA to perform Unscheduled Maintenance to repair, at their cost, faults occurring after expiry of the defects notification period.

The OEM's liability for failure to fulfil the repair obligation will be limited contractually. The level of liability cap normally reflects the track record of the turbine technology – a stronger history of reliability will justify a lower cap. Depending on the wording of the liability clause, the cost of repairs made may be deductible against the cap. However, the potential for the cap to be exhausted is much greater than with the defects warranty.

If a lender is not satisfied with the liability, e.g. if the turbine model has a history of serial defects, the owner can be asked to pay revenues into a maintenance reserve account before distributing to shareholders.

To learn more about how our services can benefit your business, sign up to our Expert Series, a collection of articles which focus on key issues faced by the wind industry. Email: experts@windprospect.com.

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consult legal advice as the cost of repairs may be deducted from the liability cap depending on the liability clause.

If a lender is not satisfied with the liability, e.g. if the turbine model has a history of serial defects, the owner can be asked to pay revenues into a maintenance reserve account before distributing to shareholders.
Cobra Energia: the right choice for renewable energy solutions in Africa

Cobra Energia, the energy division of Grupo Cobra, has evolved to become a world leader thanks to its ability and determination to develop, build and operate energy infrastructure requiring a high level of service. Its success has been based on its excellence in integration, technological innovation and financial strength.

Founded in 1944, Grupo Cobra is integrated within the industrial services and energy business of the ACS Group, a Spanish construction and industrial conglomerate, which is one of the top five contractors in the world.

Grupo Cobra benefits from its broad and varied experience over the course of more than 75 years covering the entire value chain of industrial services, from the development, applied engineering and construction of new projects to the operation and maintenance of industrial infrastructure in the energy, communications and control system sectors. The company has a presence in five continents, with projects in more than 55 countries and more than 39,000 employees worldwide generating a turnover of more than Eur7 billion in 2013.

From a technological standpoint, Grupo Cobra maintains a policy of responding to fast-developing technologies by investing in research and training, hiring specialists and purchasing the equipment needed to remain highly competitive. We consider this to be our hallmark in the sector.

In short, Grupo Cobra offers a complete spectrum of services geared to companies operating primarily in the energy, industry, transport, telecommunications and services sectors. These services range from execution management of parts of projects or activities as required by customers, up to assuming full responsibility for entire projects or activities (turnkey solutions).
Grupo Cobra’s track record

**SOLAR THERMAL PLANTS**
- Operation: 400 MW
- Built (under construction): 519.9 MW (110 MW)
- Development: 300 MW

**SOLAR PHOTOVOLTAIC PLANTS**
- Operation: 198.63 MW
- Development: 455 MW
- Study: 620 MW

**WIND FARMS**
- Operation: 1,794 MW
- Built (under construction): 1,797 MW (90 MW)
- Development: 230 MW
- Study: 650 MW

**BIOMASS/GASIFICATION PLANTS**
- Development / study: 200 MW
- Built (under construction): 28 MW

Source: Cobra Energia

During the last three decades Cobra Energia has taken charge of contracts related to the development, design, supply, construction, operation and maintenance of electricity generation, oil, gas and engineering applied to industrial facilities.

Over many years Cobra Energia has accumulated an extensive and proven track record in all renewable energy technologies, including CSP, PV, offshore & onshore wind, biomass, waste to energy and geothermal projects.

The company reached an installed capacity of 1.8 GW of wind capacity at the end of 2013, comprising more than 58 operating wind farms located in countries including Spain, Portugal, Mexico, Dominican Republic and Peru.

Cobra Energia has successfully completed 400 MW of CSP plants with storage. It has built a further 117 MW more as an EPC contractor for third parties. Additionally, Cobra Energia is currently building a 110 MW tower receiver solar thermal plant in the US (Tonopah, Nevada) and is about to reach financial close in a 100 MW CSP parabolic trough solar thermal plant in South Africa that it will construct, operate and maintain. This experience means Cobra Energia is now a leading company for CSP projects with storage.

The company’s deep experience in solar CSP is complemented with more than 180 MW of completed turnkey construction contracts in PV, 150 MW of which were carried out under the IPP Procurement Program developed by the DOE of the Republic of South Africa.

Cobra Energia is also experienced in developing and constructing biomass, waste to energy and geothermal projects.

Grupo Cobra has experience in many African markets including South Africa, Ghana, Angola, Cameroon, Egypt, Algeria, Tunisia, Morocco, Benin, Mauritania and the Ivory Coast. This has positioned the company as a perfect partner to develop clean energy projects in Africa.

### Cobra Energia

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- **Telephone:** +34 91 4569500

Cobra Energia, the affiliate responsible for the energy business within Grupo Cobra, has evolved to become a world leader thanks to its ability and determination to develop, build and operate energy infrastructures requiring a high level of service, based on excellence in integration, technological innovation and financial strength.
The singular objective of the ‘Powering Africa: Summit’ is to bring together proven partners from Africa looking to build relationships with credible solution providers from America – the opportunities are too great to ignore on both sides of the Atlantic.

Simon Gosling, Managing Director, EnergyNet.

Norton Rose Fulbright

AFC
D3LA Piper
SoEnergy International
Black & Veatch
Delphes International
SYMBION
Manitoba Synergie International
The Corporate Council on Africa

www.PoweringAfrica-Summit.com
Major renewable energy projects in Africa

This section provides an update on the development and construction of large-scale renewable energy projects in Africa. It focuses on projects that commenced commercial operations or started construction since the beginning of 2013. Large projects are defined as solar PV projects larger than 20 MW and wind projects larger than 50 MW. We also include other renewable energy projects such as geothermal, biomass and landfill gas that are larger than 10 MW. Projects smaller than this are not included in this section. Readers interested in smaller projects in Africa should refer to Clean Energy Pipeline’s project directory.

Since the beginning of 2013, 25 large scale renewable energy projects with an aggregate capacity of 2.1 GW have been brought online in Africa. The majority of this capacity is located in South Africa, Morocco, Kenya and Egypt.

South Africa

South Africa is by far the largest renewable energy market in Africa, accounting for approximately 50% of all large-scale installed capacity across the continent. In addition, 16 of the 25 large scale renewable energy projects brought online in Africa since the beginning of 2013 are in South Africa.

The recent ramp up of installed capacity has been underpinned by the country’s competitive tendering mechanism known as the Renewable Energy Independent Power Producer Procurement Program (REIPPPP). The REIPPPP was jointly launched in 2011 by South Africa’s Department of Energy, the National Energy Regulator, and state utility Eskom to replace the unsuccessful renewable energy feed-in-tariff regime which resulted in no renewable energy capacity being developed.

Under the REIPPPP, private power producers are invited to submit project proposals in a series of windows. Successful bidders will sign power purchase agreements with Eskom, which buys the electric power generated at a fixed tariff. The REIPPPP is expected to award 3,725 MW of contracts in five bidding windows. Contracts have been awarded in three rounds so far.

Successful bidders in the first round were announced in November 2011, while successful bidders in the second and third rounds were announced in May 2012 and October 2013 respectively. The winning bidders in the fourth round were due to be announced in late October 2014 but were delayed after the Department of Energy sent letters in September 2014 to certain bidders seeking extra clarification for the purpose of continued evaluation. The results of the fourth round will be announced later this year or in early 2015.
The 64 projects awarded across the three windows represent a total investment of $14 billion. All 47 projects awarded in windows one and two have reached financial close, while around half of the projects awarded in window three have reached financial close.

### Large-scale renewable energy projects starting operation in 2013 and 2014 in South Africa

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>REIPPPP ROUND</th>
<th>CAPACITY (MW)</th>
<th>INVESTMENT ($ MILLION)</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER(S)</th>
<th>PROJECT SPONSOR(S)</th>
<th>DEBT PROVIDER(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tsitsikamma community wind farm</td>
<td>Round II</td>
<td>95.0</td>
<td>223</td>
<td>On-shore Wind</td>
<td>Watt Energy / Cennergi (Pty) Ltd.</td>
<td>Watt Energy / Cennergi (Pty) Ltd. / Tsitsikamma Community Trust</td>
<td>Nedbank Ltd.</td>
</tr>
<tr>
<td>Hopefield</td>
<td>Round I</td>
<td>67.0</td>
<td>167</td>
<td>On-shore Wind</td>
<td>Umoya we Sizw Energy &amp; Distribution Ltd.</td>
<td>African Infrastructure Investment Fund / Kagiso Infrastructure Empowerment Fund / Old Mutual Life Assurance Company Ltd. / Tomlo Commodities (Pty) Ltd.</td>
<td>Rand Merchant Bank</td>
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<tr>
<td>Kathu</td>
<td>Round I</td>
<td>82.0</td>
<td>346</td>
<td>Solar PV</td>
<td>Building Energy / WBHO pty Ltd.</td>
<td>Macquarie Group Ltd. / Old Mutual Life Assurance Company Ltd. / Building Energy</td>
<td>Development Bank of Southern Africa / Rand Merchant Bank</td>
</tr>
</tbody>
</table>

**CONTINUED**
### Large-scale renewable energy projects starting operation in 2013 and 2014 in South Africa (continued)

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>REIPPPP ROUND</th>
<th>CAPACITY (MW)</th>
<th>INVESTMENT ($ MILLION)</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER(S)</th>
<th>PROJECT SPONSOR(S)</th>
<th>DEBT PROVIDER(S)</th>
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</table>

Source: Clean Energy Pipeline
## Construction-stage large-scale renewable energy projects in South Africa

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>REIPPPP ROUND</th>
<th>CAPACITY (MW)</th>
<th>INVESTMENT ($ MILLION)</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER(S)</th>
<th>PROJECT SPONSOR(S)</th>
<th>DEBT PROVIDER(S)</th>
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<td>Gouda</td>
<td>Round II</td>
<td>138.0</td>
<td>270</td>
<td>On-shore Wind</td>
<td>Acciona Energia</td>
<td>Acciona Energia SA / Aveng Group</td>
<td>Investec plc / Nedbank Ltd. / Rand Merchant Bank</td>
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<tr>
<td>West Coast 1</td>
<td>Round II</td>
<td>94.0</td>
<td>210</td>
<td>On-shore Wind</td>
<td>GDF SUEZ SA / Moyeng Energy (Pty) Ltd.</td>
<td>GDF SUEZ SA / Investec plc / Kagiso Tiso Holdings</td>
<td>Investec plc / Nedbank Ltd. / Development Bank of Southern Africa</td>
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<td>Grassridge</td>
<td>Round II</td>
<td>60.0</td>
<td>112</td>
<td>On-shore Wind</td>
<td>EDF Energies Nouvelles</td>
<td>EDF Energies Nouvelles SA / Industrial Development Corporation of South Africa Ltd.</td>
<td>Industrial Development Corporation of South Africa Ltd. / Absa Capital</td>
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<td>Sishen</td>
<td>Round II</td>
<td>74.0</td>
<td>233</td>
<td>Solar PV</td>
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<td>Acciona Energia SA / Aveng Group</td>
<td>Investec plc / Nedbank Ltd.</td>
</tr>
<tr>
<td>Boshoff</td>
<td>Round II</td>
<td>60.0</td>
<td>250</td>
<td>Solar PV</td>
<td>SunEdison Inc.</td>
<td>SunEdison Inc. / Public Investment Corporation (PIC) / Nehawu Investment Holdings</td>
<td>Overseas Private Investment Corp. (OPIC)</td>
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<td>Bokpoort</td>
<td>Round II</td>
<td>50.0</td>
<td>565</td>
<td>CSP</td>
<td>International Company for Water and Power Projects / Solafrica Thermal Energy (Pty) Ltd.</td>
<td>Acwa Power / Public Investment Corporation (PIC) / Lereko Investments Pty Ltd.</td>
<td>Investec plc / Absa Capital / Old Mutual Life Assurance Company Ltd.</td>
</tr>
<tr>
<td>Dorper</td>
<td>Round I</td>
<td>100.0</td>
<td>257</td>
<td>On-shore Wind</td>
<td>Sumitomo Corp. / Dorper Wind Development Ltd. / Black Economic Empowerment holding</td>
<td>Sumitomo Corp. / Dorper Wind Development Ltd. / Black Economic Empowerment holding</td>
<td>Sumitomo Mitsui Banking Corp. / Nedbank Ltd. / Absa Capital</td>
</tr>
<tr>
<td>Kouga</td>
<td>Round I</td>
<td>80.0</td>
<td>192</td>
<td>On-shore Wind</td>
<td>Red Cap Investments Pty Ltd.</td>
<td>Inspired Evolution Investment Management / EuroCape New Energy Ltd. / Industrial Development Corporation of South Africa Ltd. / Red Cap Investments Pty Ltd. / Afri-Coast Engineers SA Pty Ltd</td>
<td>Standard Bank Group Ltd.</td>
</tr>
</tbody>
</table>
## Construction-stage large-scale renewable energy projects in South Africa (continued)

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>REIPPPP ROUND</th>
<th>CAPACITY (MW)</th>
<th>INVESTMENT ($ MILLION)</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER(S)</th>
<th>PROJECT SPONSOR(S)</th>
<th>DEBT PROVIDER(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaxu Solar One</td>
<td>Round I</td>
<td>100.0</td>
<td>893</td>
<td>CSP</td>
<td>Abengoa Solar SA / Industrial Development Corporation of South Africa Ltd. / Black Economic Empowerment holding</td>
<td>Abengoa Solar SA / Industrial Development Corporation of South Africa Ltd. / Black Economic Empowerment holding</td>
<td>Industrial Development Corporation of South Africa Ltd. / Nedbank Ltd. / Clean Technology Fund / Development Bank of Southern Africa / Rand Merchant Bank</td>
</tr>
<tr>
<td>Khi Solar One</td>
<td>Round I</td>
<td>50.0</td>
<td>446</td>
<td>CSP</td>
<td>Abengoa Solar SA / Industrial Development Corporation of South Africa Ltd. / Black Economic Empowerment holding</td>
<td>Abengoa Solar SA / Industrial Development Corporation of South Africa Ltd. / Black Economic Empowerment holding</td>
<td>Industrial Development Corporation of South Africa Ltd. / Nedbank Ltd. / Clean Technology Fund / Development Bank of Southern Africa / Rand Merchant Bank</td>
</tr>
<tr>
<td>Tousriver</td>
<td>Round I</td>
<td>44.0</td>
<td>n/a</td>
<td>CPV</td>
<td>Soitec SA</td>
<td>Soitec SA / Public Investment Corporation (PIC) / Government Employees Pension Fund / Pele Green Energy Pty Ltd.</td>
<td>Standard Bank Group Ltd.</td>
</tr>
<tr>
<td>Sere*</td>
<td></td>
<td>100.0</td>
<td>375</td>
<td>On-shore Wind</td>
<td>Eskom Holdings Ltd.</td>
<td>Eskom Holdings Ltd.</td>
<td>Agence Française de Développement / African Development Bank / World Bank</td>
</tr>
<tr>
<td>Kiwano*</td>
<td></td>
<td>100.0</td>
<td>950</td>
<td>CSP</td>
<td>Eskom Holdings Ltd.</td>
<td>Eskom Holdings Ltd.</td>
<td>European Investment Bank / Agence Française de Développement / African Development Bank / Clean Technology Fund / World Bank / KFW Bankengruppe</td>
</tr>
</tbody>
</table>

Source: Clean Energy Pipeline

* The Sere wind farm and the Kiwano CSP plant were developed by state utility Eskom and not part of the Renewable Energy Independent Power Producer Procurement Program (REIPPPP).
The International Project Finance Association (IPFA) is an independent, not-for-profit, professional association dedicated to providing up-to-date information on best practice, industry trends and new developments in infrastructure and energy. Collaborating with over 480 public and private sector members, IPFA provides a continuous programme of over 80 industry events which focus on investment and development matters that are of critical interest to infrastructure and energy practitioners, enabling excellent networking opportunities with senior professionals, across the industry.
Egypt

Egypt’s Gulf of Suez and Gulf of El Zayt regions have considerable wind energy potential due to the strong wind energy resource present. Wind energy has been deployed in the country for more than a decade. The Egyptian government has confirmed its commitment to a 7.2 GW wind target by 2020. Egypt’s largest wind farm - the 500 MW Zafarana scheme - was developed in phases from 2000 to 2010 and is currently one of the largest wind farms in the world. The country has not brought online any major renewable energy projects during the past two years but three projects in the Gulf of El Zayt totalling 540 MW are currently being built by the New and Renewable Energy Authority (NREA).

All projects have secured financing from European and Japanese development banks. The 200 MW Eur340 million Gulf of El Zayt I project was financed by the European Investment Bank, KfW Bankengruppe and Agence Francaise de Developpement. The 220 MW Gulf of El Zayt II wind farm secured debt financing from the Japan International Cooperation Agency. Finally, the Spanish Government directly funded a 120 MW scheme known as Gulf of El Zayt Spanish in the region.

Kenya

Kenya has vast geothermal resources with a measured potential of up to 10 GW. The country is targeting 5.53 GW of geothermal capacity by 2030. Since the beginning of 2013, three major geothermal plants – Olkaria I – Units 4 and 5 (140 MW), Olkaria III – Unit 3 (62 MW) and Olkaria IV (140 MW) – have been put into service. Kenya has also kick-started its wind energy sector and currently hosts the largest wind farm being constructed in Africa – the 310 MW Lake Turkana project that reached financial close in March 2014.

The project secured Eur623 million ($859 million) from equity sponsors Vestas Wind Systems, Norfund, Aldwych International, Finnfund, KP&P BV and IFU (Danish Investment Fund for Developing Countries), and debt providers European Investment Bank, African Development Bank, FMO NV, Deutsche Investitions-und Entwicklungsgesellschaft, Proparco, Nedbank and Standard Bank Group.

Morocco

Morocco is the only North African country with no natural oil resources. Rising oil prices combined with rapidly growing energy demand during the past three years has resulted in Morocco establishing plans to expand its renewable energy generation capacity. Due to its natural renewable energy resources, the country is focusing on onshore wind and concentrated solar power (CSP).

The development of wind projects is being managed through ‘The Moroccan Integrated Wind Energy Project’, which was launched in 2010. The project aims to bring installed wind capacity to 2,000 MW by 2020. Notably, Morocco is home of the 300 MW Tarfaya wind farm, which is the largest wind farm brought online during the past two years in Africa. The project, which came online in April 2014, was developed by GDF SUEZ and NAREVA Holding at a cost of up to Eur500 million ($690 million).

Development of Morocco’s solar industry is being managed by the Moroccan Agency for Solar Energy (MASEN), which issues tenders for power purchase agreements. Projects will be built through a build, own, operate, transfer model. The first project is the 500 MW Noor CSP plant, which will be the world’s largest solar CSP plant when operational. The first 160 MW phase, which reached financial close in September 2013, is sponsored by ACWA Power, Masen Capital, Aries Ingenieria y Sistemas and TSK Electrónica y Electricidad. The first phase, which represents a total investment of 51 billion, is expected to commence commercial operations in December 2015. The pre-qualified bidders for the second (200 MW) and third (100 MW) phases were announced in August 2013. They are expected to be debt financed by KfW Bankengruppe, the World Bank, the African Development Bank and the European Investment Bank.

Large-scale renewable energy projects starting operation in 2013 and 2014 in Africa (excluding South Africa)

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>COUNTRY</th>
<th>CAPACITY (MW)</th>
<th>INVESTMENT ($ MILLION)</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER($</th>
<th>PROJECT SPONSOR($)</th>
<th>DEBT PROVIDER($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashegoda</td>
<td>Ethiopia</td>
<td>120</td>
<td>294</td>
<td>On-shore Wind</td>
<td>Ethiopian Electric Power</td>
<td>Ethiopian Electric Power</td>
<td>BNP Paribas / Agence Francaise de Developpement</td>
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<tr>
<td>Isiolo I</td>
<td>Kenya</td>
<td>50</td>
<td>130</td>
<td>On-shore Wind</td>
<td>n/a</td>
<td>Kenya Electricity Generating Company</td>
<td>n/a</td>
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</table>

CONTINUED ►
### Large-scale renewable energy projects starting operation in 2013 and 2014 in Africa (excluding South Africa) (continued)

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>COUNTRY</th>
<th>CAPACITY (MW)</th>
<th>INVESTMENT ($ MILLION)</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER(S)</th>
<th>PROJECT SPONSOR(S)</th>
<th>DEBT PROVIDER(S)</th>
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</thead>
<tbody>
<tr>
<td>Okaria III – Plant 3</td>
<td>Kenya</td>
<td>62</td>
<td>310</td>
<td>Geothermal</td>
<td>Ormat Technologies</td>
<td>Ormat Technologies</td>
<td>Overseas Private Investment Corporation</td>
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<tr>
<td>Tarfaya</td>
<td>Morocco</td>
<td>300</td>
<td>690</td>
<td>On-shore Wind</td>
<td>GDF SUEZ/ NAREVA Holding</td>
<td>GDF SUEZ/ NAREVA Holding</td>
<td>Attijariwafa Bank/ Groupe Banque Populaire / Banque Marocaine du Commerce Exterieur</td>
</tr>
<tr>
<td>KivuWatt</td>
<td>Rwanda</td>
<td>25</td>
<td>142</td>
<td>Biogas</td>
<td>Contour Global LP</td>
<td></td>
<td>African Development Bank, FMO NV/Emerging Africa Infrastructure Fund</td>
</tr>
<tr>
<td>Makeni Bio-Ethanol &amp; Biomass*</td>
<td>Sierra Leone</td>
<td>n/a</td>
<td>365</td>
<td>Bio-Ethanol / Biomass</td>
<td>Addax &amp; Oryx Group Ltd. / Swedfund / Addax &amp; Oryx Group Ltd. / FMO NV</td>
<td>KfW Bankengruppe / International Development Corp. / African Development Bank / FMO NV / Emerging Africa Infrastructure Fund / Belgian Investment Company for Developing Countries</td>
<td></td>
</tr>
</tbody>
</table>

*The Makeni Bio-Ethanol & Biomass project in Sierra Leone produces bio-ethanol from byproducts of sugarcane production and electricity for the national grid.*

Source: Clean Energy Pipeline
### Construction-stage large-scale renewable energy projects in Africa (excluding South Africa)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Country</th>
<th>Capacity (MW)</th>
<th>Investment ($ Million)</th>
<th>Technology</th>
<th>Developer(s)</th>
<th>Project Sponsor(s)</th>
<th>Debt Provider(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shariket el Kahraba wa Taket el Moutadiadida</td>
<td>Algeria</td>
<td>233</td>
<td>n/a</td>
<td>Solar-PV</td>
<td>Yingli Solar / Sinohydro / Hydrochina</td>
<td>Soneilgas</td>
<td>n/a</td>
</tr>
<tr>
<td>Zagtouli</td>
<td>Burkina Faso</td>
<td>30</td>
<td>91</td>
<td>Solar PV</td>
<td>SONABEL</td>
<td>SONABEL</td>
<td>European Investment Bank / Agence Francaise de Developpement</td>
</tr>
<tr>
<td>Zina</td>
<td>Burkina Faso</td>
<td>20</td>
<td>50</td>
<td>Solar PV</td>
<td>Windiga Energy</td>
<td>Windiga Energy</td>
<td>African Development Bank / Emerging Africa Infrastructure Fund Ltd. / Frontier Markets Fund Managers</td>
</tr>
<tr>
<td>Gulf of El Zayt Spanish</td>
<td>Egypt</td>
<td>120</td>
<td>n/a</td>
<td>On-shore Wind</td>
<td>New and Renewable Energy Authority (NREA)</td>
<td>New and Renewable Energy Authority (NREA)</td>
<td>Spanish Government</td>
</tr>
<tr>
<td>Kinangop</td>
<td>Kenya</td>
<td>60.8</td>
<td>150</td>
<td>On-shore Wind</td>
<td>Iberdrola Ingenieria y Construccion / Aeolus Kenya</td>
<td>Norfund / African Infrastructure Investment Fund / Aeolus Kenya</td>
<td>CIC Stanbic Bank</td>
</tr>
<tr>
<td>Bogoria/ Silali I</td>
<td>Kenya</td>
<td>800</td>
<td>3,100</td>
<td>Geothermal</td>
<td>Geothermal Development Company</td>
<td>Geothermal Development Company</td>
<td>Export-Import Bank of the United States / KfW Bankengruppe</td>
</tr>
<tr>
<td>Menengai</td>
<td>Kenya</td>
<td>400</td>
<td>1,000</td>
<td>Geothermal</td>
<td>Geothermal Development Company</td>
<td>Geothermal Development Company</td>
<td>African Development Bank / Climate Investment Fund / World Bank</td>
</tr>
<tr>
<td>Longonot I</td>
<td>Kenya</td>
<td>140</td>
<td>459</td>
<td>Geothermal</td>
<td>Africa Geothermal International Ltd.</td>
<td>Africa Geothermal International Ltd.</td>
<td>n/a</td>
</tr>
<tr>
<td>Al-Fatayeh</td>
<td>Libya</td>
<td>61</td>
<td>172</td>
<td>On-shore Wind</td>
<td>n/a</td>
<td>Renewable Energy Authority of Libya</td>
<td>n/a</td>
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</table>

CONTINUED ➤
## Construction-stage large-scale renewable energy projects in Africa (excluding South Africa) (continued)

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>COUNTRY</th>
<th>CAPACITY (MW)</th>
<th>INVESTMENT ($ MILLION)</th>
<th>TECHNOLOGY</th>
<th>DEVELOPER(S)</th>
<th>PROJECT SPONSOR(S)</th>
<th>DEBT PROVIDER(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singida</td>
<td>Tanzania</td>
<td>50</td>
<td>136</td>
<td>On-shore Wind</td>
<td>China Dalian International Cooperation</td>
<td>National Development Corporation of Tanzania / Tanzania Electricity Supply Company / Power Pool East Africa</td>
<td>Export-Import Bank of China</td>
</tr>
<tr>
<td>Bizerte Extension</td>
<td>Tunisia</td>
<td>135</td>
<td>323</td>
<td>On-shore Wind</td>
<td>Tunisian Company of Electricity and Gas</td>
<td>Tunisian Company of Electricity and Gas</td>
<td>Spanish Government</td>
</tr>
</tbody>
</table>

Source: Clean Energy Pipeline
South Africa’s REIPP Procurement Programme

PROJECT FINANCE ANALYSIS

This section analyses the financing of projects in the first three windows of South Africa’s Renewable Energy Independent Power Producer (REIPP) Procurement Programme. Transaction data is extracted from Clean Energy Pipeline project finance deal database.

Window one

In early November 2012, the South African government signed ZAR 47 billion ($5.4 billion) of contracts with independent power producers (IPPs) for 1.4 GW of renewable energy capacity to be developed through window one of the country’s renewable energy program. These projects, which include eight wind farms, eighteen solar PV farms and two solar CSP farms, were awarded preferred bidder status in December 2011.

The structure of the bidding system obligated bidders to have term sheets in place for project debt and equity funding prior to application. Details of all project finance deals are shown in the table below.

The four main South African commercial banks – Nedbank, ABSA Capital, Standard Bank and Rand Merchant Bank – have provided the majority of debt financing to projects awarded preferred bidder status in window one. Given the exchange rate risk, international banks have not been able to offer rates that are competitive with those offered by these four South African banks. There has also been a significant level of investment from government-backed and multilateral financial organisations, including the Development Bank of Southern Africa and Industrial Development Corporation.


Asian companies also played their part in window one projects. Japanese trading house Sumitomo Corp sponsored the 100 MW Dorper wind farm, while its financing arm Sumitomo Mitsui Banking Corporation provided project debt financing. In addition, Asian equipment manufacturers Sinovel, Suzlon, Suntech, GCL-Poly, Hanwha SolarOne, Chint Solar and Trina Solar all supplied equipment to window one projects.

International law firm Norton Rose was the most active law firm in window one, advising developers on 15 projects. There was also strong participation from Webber Wentzel, Linklaters and DLA Piper.
### South African wind energy project finance deals (window one)

<table>
<thead>
<tr>
<th>JEFFREY’S BAY WIND FARM - 138 MW</th>
<th>EASTERN CAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Developer</strong></td>
<td>Mainstream Renewable Power, Genesis Eco-Energy</td>
</tr>
<tr>
<td>Debt providers</td>
<td>Absa Capital, Development Bank of Southern Africa</td>
</tr>
<tr>
<td><strong>Financing date</strong></td>
<td>12-Nov-12 <strong>Financing closed</strong></td>
</tr>
<tr>
<td>Equity investors</td>
<td>Mainstream Renewable Power, Globeleq, Thebe Investment Corporation (advised by Bridge Capital), Old Mutual’s IDEAS Managed Fund, Enzani Technologies, Usizo Engineering, Jeffrey’s Bay Renewable Energy Community Trust</td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Webber Wentzel (Globeleq, Enzani Technologies, Usizo Engineering, Thebe Investment Corporation), Stoel Rives (Mainstream Renewable Power)</td>
</tr>
<tr>
<td>Project equipment/services providers</td>
<td>Siemens (turbine supply), Group Five Iberdrola (engineering), Enzani Technologies (engineering), Usizo Engineering (engineering), GL Garrad Hassan (wind resource and energy yield assessment), Wind Prospect (wind resource and energy yield assessment)</td>
</tr>
<tr>
<td>Debt providers</td>
<td>Absa Capital, Development Bank of Southern Africa</td>
</tr>
<tr>
<td>Equity investors</td>
<td>Mainstream Renewable Power, Globeleq, Thebe Investment Corporation (advised by Bridge Capital), Old Mutual’s IDEAS Managed Fund, Enzani Technologies, Usizo Engineering, Jeffrey’s Bay Renewable Energy Community Trust</td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Webber Wentzel (Globeleq, Enzani Technologies, Usizo Engineering, Thebe Investment Corporation), Stoel Rives (Mainstream Renewable Power)</td>
</tr>
<tr>
<td>Project equipment/services providers</td>
<td>Siemens (turbine supply), Group Five Iberdrola (engineering), Enzani Technologies (engineering), Usizo Engineering (engineering), GL Garrad Hassan (wind resource and energy yield assessment), Wind Prospect (wind resource and energy yield assessment)</td>
</tr>
<tr>
<td>Debt providers</td>
<td>Absa Capital, Development Bank of Southern Africa</td>
</tr>
<tr>
<td>Equity investors</td>
<td>Mainstream Renewable Power, Globeleq, Thebe Investment Corporation (advised by Bridge Capital), Old Mutual’s IDEAS Managed Fund, Enzani Technologies, Usizo Engineering, Jeffrey’s Bay Renewable Energy Community Trust</td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Webber Wentzel (Globeleq, Enzani Technologies, Usizo Engineering, Thebe Investment Corporation), Stoel Rives (Mainstream Renewable Power)</td>
</tr>
<tr>
<td>Project equipment/services providers</td>
<td>Siemens (turbine supply), Group Five Iberdrola (engineering), Enzani Technologies (engineering), Usizo Engineering (engineering), GL Garrad Hassan (wind resource and energy yield assessment), Wind Prospect (wind resource and energy yield assessment)</td>
</tr>
<tr>
<td>Debt providers</td>
<td>Absa Capital, Development Bank of Southern Africa</td>
</tr>
<tr>
<td>Equity investors</td>
<td>Mainstream Renewable Power, Globeleq, Thebe Investment Corporation (advised by Bridge Capital), Old Mutual’s IDEAS Managed Fund, Enzani Technologies, Usizo Engineering, Jeffrey’s Bay Renewable Energy Community Trust</td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Webber Wentzel (Globeleq, Enzani Technologies, Usizo Engineering, Thebe Investment Corporation), Stoel Rives (Mainstream Renewable Power)</td>
</tr>
<tr>
<td>Project equipment/services providers</td>
<td>Siemens (turbine supply), Group Five Iberdrola (engineering), Enzani Technologies (engineering), Usizo Engineering (engineering), GL Garrad Hassan (wind resource and energy yield assessment), Wind Prospect (wind resource and energy yield assessment)</td>
</tr>
</tbody>
</table>

### COOKHOUSE WIND FARM - 138.6 MW

<table>
<thead>
<tr>
<th>Developer</th>
<th>Africa Clean Energy Developments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing date</td>
<td>06-Nov-12* <strong>Financing closed</strong></td>
</tr>
<tr>
<td>Debt providers</td>
<td>Nedbank Capital, Standard Bank, International Development Corporation</td>
</tr>
<tr>
<td>Equity investors</td>
<td>Africa Clean Energy Developments, African Infrastructure Investment Managers (50:50 joint venture between Macquarie Africa and Old Mutual’s IDEAS Managed Fund), Globeleq</td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Webber Wentzel (Globeleq), Norton Rose (Nedbank, Standard Bank)</td>
</tr>
<tr>
<td>Project equipment/services providers</td>
<td>Suzlon (turbine supply and EPC)</td>
</tr>
</tbody>
</table>

**The date of financial closure has not been disclosed, so has been assumed to take place on November 6, 2012.**

### DORPER WIND FARM - 100 MW

<table>
<thead>
<tr>
<th>Developer</th>
<th>Sumitomo Corp, Rainmaker Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing date</td>
<td>06-Nov-12 <strong>Financing closed</strong></td>
</tr>
<tr>
<td>Debt providers</td>
<td>Nedbank Capital, ABSA Capital, Sumitomo Mitsui Banking Corporation, Euler Hermes* *</td>
</tr>
<tr>
<td>Equity investors</td>
<td>Sumitomo Corp, Rainmaker Energy, BEE Consortium</td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Webber Wentzel (Sumitomo), DLA Piper (Nedbank, ABSA Capital)</td>
</tr>
<tr>
<td>Project equipment/services providers</td>
<td>Nordex (turbine supply)</td>
</tr>
</tbody>
</table>

*On November 6, 2012, the project secured $180 million project debt financing. It is assumed that the remaining $77 million has been contributed by the project sponsors and third part equity investors. **Export Credit Agency Euler Hermes guaranteed 80% of the total loan.

### RED CAP KOUGA WIND FARM - 80 MW

<table>
<thead>
<tr>
<th>Developer</th>
<th>Red Cap Investments, Eurocape Renewables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing date</td>
<td>21-Nov-12 <strong>Financing closed</strong></td>
</tr>
<tr>
<td>Debt providers</td>
<td>Standard Bank, Nedbank</td>
</tr>
<tr>
<td>Equity investors</td>
<td>Red Cap Investments, Afri-Coast Engineers SA, Eurocape Renewables, Inspired Evolution Investment Management, Industrial Development Corporation</td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>DLA Piper (Nedbank, Standard Bank), Norton Rose</td>
</tr>
<tr>
<td>Project equipment/services providers</td>
<td>Nordex (turbine supply), Afri-Coast Engineers (engineering)</td>
</tr>
</tbody>
</table>

*The volume of project financing has not been disclosed and has therefore been estimated at $192 million on the basis that wind energy typically requires $2.4 million per MW to bring online in South Africa.
### South African wind energy project finance deals (window one) (continued)

#### NOBLESFONTEIN WIND FARM - 73.8 MW  
**KAROO, VICTORIA WEST**

<table>
<thead>
<tr>
<th>Developer</th>
<th>Shanduka Group, Gestamp Wind, Sarge</th>
<th>Financing date</th>
<th>23-Nov-12</th>
<th>Financing closed</th>
<th>$167 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt providers</td>
<td>Standard Bank</td>
<td>Equity investors</td>
<td>Shanduka Group, Gestamp Wind, Sarge, Nobelsfontein Educational Trust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Dewey &amp; Le Boeuf LLC</td>
<td>Project equipment/services providers</td>
<td>Gestamp Wind Steel (turbine tower supply), Wind Prospect (wind resource and energy yield assessment for developers), Savannah (environmental impact assessment), Arup (wind resource and energy yield assessment for lenders)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### HOPEFIELD WIND FARM - 67 MW  
**HOPEFIELD, WESTERN CAPE**

<table>
<thead>
<tr>
<th>Developer</th>
<th>Umoya Energy</th>
<th>Financing date</th>
<th>12-Nov-12</th>
<th>Financing closed</th>
<th>$167 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt providers</td>
<td>Rand Merchant Bank</td>
<td>Equity investors</td>
<td>Umoya Energy (backed by African Infrastructure Investment Fund, Kagiso Infrastructure Empowerment Fund, Infrastructural Developments Environmental Assets Fund, Tomlo Commodities, Hopefield Wind Farm Local Community Company), Old Mutual’s Infrastructural Developments Environmental Assets Fund</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Webber Wentzel (Umoya Energy), Trinity International LLC</td>
<td>Project equipment/services providers</td>
<td>Vestas (turbine supply, EPC and O&amp;M)</td>
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<td></td>
</tr>
</tbody>
</table>

#### METROWIND VAN STADENS WIND FARM - 27 MW  
**NELSON MANDELA BAY METROPOLITAN AREA, EASTERN CAPE**

<table>
<thead>
<tr>
<th>Developer</th>
<th>Basil Read, MetroWind</th>
<th>Financing date</th>
<th>16-Nov-12</th>
<th>Financing closed</th>
<th>$73 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt providers</td>
<td>Standard Bank</td>
<td>Equity investors</td>
<td>Basil Read, Old Mutual Investment Group, Spilled Water Renewable, BRE, AfriCoast SA, BEE Community Trust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Norton Rose (Standard Bank)</td>
<td>Project equipment/services providers</td>
<td>Sinovel (turbine supply), Basil Read (EPC)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### DASSIESKILP WIND FARM - 27 MW  
**CALEDON, WESTERN CAPE**

<table>
<thead>
<tr>
<th>Developer</th>
<th>BioTherm Energy</th>
<th>Financing date</th>
<th>20-Nov-12</th>
<th>Financing closed</th>
<th>$65 million*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt providers</td>
<td>Standard Bank, Industrial Development Corporation, Nedbank</td>
<td>Equity investors</td>
<td>BioTherm Energy (backed by Denham Capital), Ikamva Labantu Empowerment Trust, Malibongwe Womens Development Trust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Webber Wentzel in partnership with Linklaters (Standard Bank, Industrial Development Corporation)</td>
<td>Project equipment/services providers</td>
<td>Sinovel (turbine supply), BioTherm O&amp;M (O&amp;M), Group Five Iberdrola (engineering)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The volume of project financing has not been disclosed and has therefore been estimated at $65 million on the basis that wind energy typically requires $2.4 million per MW to bring online in South Africa.
## South African solar photovoltaic energy project finance deals (window one)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Developer(s)</th>
<th>Financing date</th>
<th>Financing closed</th>
<th>Debt providers</th>
<th>Equity investors</th>
<th>Legal Advisors</th>
<th>Project equipment/services providers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KATHU SOLAR PV FARM - 81 MW</strong></td>
<td>WBHO Building Energy, VentuSA energy Pty</td>
<td>06-Nov-12</td>
<td>Financing closed</td>
<td>Rand Merchant Bank, Development Bank of Southern Africa</td>
<td>WBHO Building Energy, Old Mutual’s IDEAS Fund, African Infrastructure Investment Fund (backed by Old Mutual and Macquarie), BuiltAfrica Kathu Solar 7, Kathu Solar Community Trust</td>
<td>Webber Wentzel (Guma group, Building Energy), DLA Piper (WBHO Building Energy)</td>
<td>JinkoSolar (module supply), Elettronica Santerno (inverter supply), Ercam (traching systems supply), GCL-Poly Energy Holdings (wafer supply), WBHO Building Energy (EPC), Guma group (O&amp;M)</td>
</tr>
<tr>
<td><strong>LESEDI SOLAR PV FARM - 75 MW</strong></td>
<td>SolarReserve, Kensani Group, Intikon Energy</td>
<td>13-Nov-12</td>
<td>Financing closed</td>
<td>Rand Merchant Bank, Development Bank of Southern Africa</td>
<td>IDEAS Managed Fund (managed by Old Mutual Investment Group South Africa), Kensani Capital Investments, GCL-Poly Energy Holdings, SolarReserve, Intikon</td>
<td>Baker &amp; McKenzie (SolarReserve), Norton Rose (Rand Merchant Bank), Webber Wentzel (Solar Reserve)</td>
<td>Hanwha SolarOne (module supply), ACS Cobra (EPC &amp; O&amp;M), Gransolar (EPC), Kensani Energy (EPC), Siemens (EPC), Schneider (EPC)</td>
</tr>
<tr>
<td><strong>LETSATI SOLAR PV FARM - 75 MW</strong></td>
<td>SolarReserve, Kensani Group, Intikon Energy</td>
<td>13-Nov-12</td>
<td>Financing closed</td>
<td>Rand Merchant Bank, Development Bank of Southern Africa</td>
<td>IDEAS Managed Fund (managed by Old Mutual Investment Group South Africa), Kensani Capital Investments, GCL-Poly Energy Holdings, SolarReserve, Intikon</td>
<td>Baker &amp; McKenzie (SolarReserve), Norton Rose (Rand Merchant Bank), Webber Wentzel (Solar Reserve)</td>
<td>Hanwha SolarOne (module supply), ACS Cobra (EPC &amp; O&amp;M), Gransolar (EPC), Kensani Energy (EPC), Siemens (EPC), Schneider (EPC)</td>
</tr>
<tr>
<td><strong>KALKBULT SOLAR PV FARM - 75 MW</strong></td>
<td>Scatec Solar</td>
<td>08-Nov-12</td>
<td>Financing closed</td>
<td>Standard Bank, Development Bank of Southern Africa</td>
<td>Scatec Solar ( Owned by Scatec and Itochu), Norfund, Old Mutual Investment Group, Simacel</td>
<td>Norton Rose</td>
<td>Scatec Solar (O&amp;M), Kentz Corp (EPC)</td>
</tr>
<tr>
<td><strong>SOLAR CAPITAL DE AAR SOLAR PV FARM - 75 MW</strong></td>
<td>Solar Capital</td>
<td>27-Nov-12</td>
<td>Financing closed</td>
<td>Standard Bank</td>
<td>Solar Capital (Subsidiary of Moncada Energy Group)</td>
<td>Webber Wentzel in partnership with Linklaters (Standard Bank), DLA Piper (Solar Capital)</td>
<td>GCL-Poly Energy Holdings (wafer supply), Moncada Energy Group SRL (module supply &amp; EPC)</td>
</tr>
</tbody>
</table>
### South African solar photovoltaic energy project finance deals (window one) (continued)

<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing date</th>
<th>Financing closed</th>
<th>Debt providers</th>
<th>Equity investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>WITKOP SOLAR PV FARM - 30 MW</td>
<td>28-Nov-12</td>
<td>$162 million</td>
<td>Standard Bank, Futuregrowth Asset Management (a subsidiary of Old Mutual)</td>
<td>SunEdison, Chint Solar, Public Investment Corporation, Videovision Investments, Kurisani Witkop Trust</td>
</tr>
<tr>
<td>Developer</td>
<td>Financing date</td>
<td>Financing closed</td>
<td>Debt providers</td>
<td>Equity investors</td>
</tr>
<tr>
<td>Developer</td>
<td>Financing date</td>
<td>Financing closed</td>
<td>Debt providers</td>
<td>Equity investors</td>
</tr>
<tr>
<td>Developer</td>
<td>Financing date</td>
<td>Financing closed</td>
<td>Debt providers</td>
<td>Equity investors</td>
</tr>
<tr>
<td>SOUTHOPAN SOLAR PV FARM - 28 MW</td>
<td>28-Nov-12</td>
<td>$152 million</td>
<td>Standard Bank, Futuregrowth Asset Management (a subsidiary of Old Mutual)</td>
<td>SunEdison, Chint Solar, Public Investment Corporation, Videovision Investments, Kurisani Witkop Trust</td>
</tr>
</tbody>
</table>

**Legal Advisors**

- Cliffe Dekker Hofmeyr (SunEdison) for Project equipment/services providers.
- Webber Wentzel (Globeleq, Enzani Technologies, Usizo Engineering, Thebe Investment Corporation), Stoel Rives (Mainstream Renewable Power) for Project equipment/services providers.
- Suntech (module supply), Siemens (inverter supply), Group Five Iberdrola (engineering), Enzani Technologies (engineering), Usizo Engineering (engineering), GL Garrad Hassan (solar resource and energy yield assessment), Poyry (solar resource and energy yield assessment) for Project equipment/services providers.

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**Continued...**
<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing date</th>
<th>Financing closed</th>
<th>NORTHERN CAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HERBERT SOLAR PV FARM - 22.5 MW</td>
<td>16-Nov-12</td>
<td>$100 million</td>
<td></td>
</tr>
<tr>
<td>Developer</td>
<td>Standard Bank, Development Bank of Southern Africa</td>
<td>AE-AMD Renewable Energy</td>
<td></td>
</tr>
<tr>
<td>Debt providers</td>
<td>Equity investors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Norton Rose</td>
<td>Project equipment/services providers</td>
<td>Undisclosed</td>
</tr>
<tr>
<td>PRIESKA SOLAR PV FARM - 20 MW</td>
<td>07-Nov-12</td>
<td>$70 million</td>
<td></td>
</tr>
<tr>
<td>Developer</td>
<td>Mulilo Renewable Energy, Gestamp Solar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt providers</td>
<td>Nedbank Capital, Industrial Development Corporation</td>
<td>Mulilo Renewable Energy, Gestamp Solar, Mulilo De Aar Solar Community</td>
<td></td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Norton Rose (Nedbank Capital, Industrial Development Corporation )</td>
<td>Trina Solar (module supply), GP Tech (Inverter supply), Gestamp Solar (O&amp;M), ABB South Africa (EPC &amp; O&amp;M)</td>
<td></td>
</tr>
<tr>
<td>GREEFS PAN SOLAR PV FARM - 11.2 MW</td>
<td>16-Nov-12</td>
<td>$50 million</td>
<td></td>
</tr>
<tr>
<td>Developer</td>
<td>AE-AMD Renewable Energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt providers</td>
<td>Standard Bank, Development Bank of Southern Africa</td>
<td>AE-AMD Renewable Energy</td>
<td></td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Norton Rose</td>
<td>Project equipment/services providers</td>
<td>Undisclosed</td>
</tr>
<tr>
<td>ARIES SOLAR PV FARM - 10 MW</td>
<td>20-Nov-12</td>
<td>$36 million*</td>
<td></td>
</tr>
<tr>
<td>Developer</td>
<td>BioTherm Energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt providers</td>
<td>Standard Bank, Industrial Development Corporation, Nedbank</td>
<td>BioTherm Energy (backed by Denham Capital), Ikamva Labantu Empowerment Trust, Malibongwe Womens Development Trust</td>
<td></td>
</tr>
<tr>
<td>Legal Advisors</td>
<td>Norton Rose (Industrial Development Corporation, Nedbank)</td>
<td>SMA Solar (Inverter supply), Juwi Solar (EPC), BioTherm O&amp;M (O&amp;M)</td>
<td></td>
</tr>
</tbody>
</table>

*The volume of project financing has not been disclosed and has therefore been estimated at $36 million on the basis that solar PV energy typically requires $3.6 million per MW to bring online in South Africa.
### South African solar photovoltaic energy project finance deals (window one) (continued)

<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing date</th>
<th>POFADDER, NORTHERN CAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KONKOO NSIES SOLAR PV FARM - 10 MW</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BioTherm Energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt providers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Bank, Industrial</td>
<td>20-Nov-12</td>
<td>$36 million*</td>
</tr>
<tr>
<td>Development Corporation, Nedbank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity investors</td>
<td></td>
<td>BioTherm Energy (backed by Denham Capital), Ikalma Labantu Empowerment Trust, Malibongwe Women's Development Trust</td>
</tr>
<tr>
<td>Legal Advisors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norton Rose (Industrial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development Corporation,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nedbank)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project equipment/services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>providers</td>
<td></td>
<td>Juwi Solar (EPC), BioTherm O&amp;M (O&amp;M)</td>
</tr>
</tbody>
</table>

*The volume of project financing has not been disclosed and has therefore been estimated at $36 million on the basis that solar PV energy typically requires $3.6 million per MW to bring online in South Africa.

<table>
<thead>
<tr>
<th>DE AAR SOLAR PV FARM - 10 MW</th>
<th>DE AAR, NORTHERN CAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer</td>
<td></td>
</tr>
<tr>
<td>Mulilo Renewable Energy, Gestamp Solar</td>
<td></td>
</tr>
<tr>
<td>Debt providers</td>
<td></td>
</tr>
<tr>
<td>Nedbank Capital, Industrial</td>
<td>07-Nov-12</td>
</tr>
<tr>
<td>Development Corporation</td>
<td>Financing closed</td>
</tr>
<tr>
<td>Equity investors</td>
<td></td>
</tr>
<tr>
<td>Legal Advisors</td>
<td></td>
</tr>
<tr>
<td>Norton Rose (Nedbank Capital, Industrial Development Corporation)</td>
<td></td>
</tr>
<tr>
<td>Project equipment/services</td>
<td></td>
</tr>
<tr>
<td>providers</td>
<td></td>
</tr>
</tbody>
</table>

### DE AAR SOLAR PV FARM - 10 MW

| Developer                      |                        |
|-------------------------------|                        |
| Mulilo Renewable Energy, Gestamp Solar |                | $35 million |
| Debt providers                 |                        |
| Nedbank Capital, Industrial    | 07-Nov-12              |                         |
| Development Corporation        | Financing closed       |                         |
| Equity investors               |                        | Mulilo Renewable Energy, Gestamp Solar, Mulilo Prieska Solar Community |
| Legal Advisors                |                        |                         |
| Norton Rose (Nedbank Capital, Industrial Development Corporation) |                |                         |
| Project equipment/services     |                        |                         |
| providers                      |                        | Trina Solar (module supply), GP Tech (inverter supply), Gestamp Solar (O&M), ABB South Africa (EPC & O&M) |

### RUSTMO SOLAR PV FARM - 6.76 MW

| Developer                      |                        |
|-------------------------------|                        |
| Momentous Energy              | 06-Nov-12**            | $24 million*            |
| Debt providers                 |                        |
| Nedbank Capital, Industrial    | Financing closed       |                         |
| Development Corporation        |                        | Momentous Energy, Inspired Evolution (a DFI fund), The Momentous Foundation Community Trust |
| Equity investors               |                        |                         |
| Legal Advisors                |                        |                         |
| Norton Rose (Nedbank Capital, Industrial Development Corporation), DLA Piper (Momentous Energy) |                |                         |
| Project equipment/services     |                        |                         |
| providers                      |                        | Juwi Solar (EPC & O&M) |

*The volume of project financing has not been disclosed and has therefore been estimated at $24 million on the basis that solar PV energy typically requires $3.6 million per MW to bring online in South Africa.

**The date of financial closure has not been disclosed, so has been assumed to take place on November 6, 2012.

### SLIMSuN SWARTLAND SOLAR PV FARM - 5 MW

| Developer                      |                        |
|-------------------------------|                        |
| SlimSun                       | 06-Nov-12**            | $18 million*            |
| Debt providers                 |                        |
| Nedbank Capital, Industrial    | Financing closed       |                         |
| Development Corporation        |                        | Evolution One Fund, Franco Afrique Technologies, Swartland Solar Community Trust |
| Equity investors               |                        |                         |
| Legal Advisors                |                        |                         |
| DLA Piper (Industrial Development Corporation, Nedbank) |                |                         |
| Project equipment/services     |                        |                         |
| providers                      |                        | BYD Energy (module supply), SMA Solar (inverter supply), Juwi Solar (EPC & O&M) |

*The volume of project financing has not been disclosed and has therefore been estimated at $18 million on the basis that solar PV energy typically requires $3.6 million per MW to bring online in South Africa.

**The date of financial closure has not been disclosed, so has been assumed to take place on November 6, 2012.
### South African solar photovoltaic energy project finance deals (window one) (continued)

<table>
<thead>
<tr>
<th>Touwsrivier Solar CPV Farm - 44 MW</th>
<th>Touwsrivier, Western Cape</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Developer</strong></td>
<td>Soitec</td>
</tr>
<tr>
<td><strong>Financing date</strong></td>
<td>09-Feb-12*</td>
</tr>
<tr>
<td><strong>Financing closed</strong></td>
<td>Undisclosed</td>
</tr>
<tr>
<td><strong>Debt providers</strong></td>
<td>Investec, Development Bank of South Africa</td>
</tr>
<tr>
<td><strong>Equity investors</strong></td>
<td>Soitec Solar, Pele Green Energy, Touwsrivier Community Trust</td>
</tr>
<tr>
<td><strong>Legal Advisors</strong></td>
<td>DLA Piper (Soitec)</td>
</tr>
<tr>
<td><strong>Project equipment/services providers</strong></td>
<td>Soitec Solar (module supply), Schneider Electric South Africa (O&amp;M)</td>
</tr>
</tbody>
</table>

*On this date Soitec announced that it has committed to finance the project and raise the equity to construct the plant. Soitec then engaged rating agency Moody’s to rate the Touwsrivier solar CPV project with a view of refinancing the project on the capital markets. On December 12th 2012, this process was concluded and a rating of Baa2 was awarded.*

### South African solar CSP energy project finance deals (window one)

<table>
<thead>
<tr>
<th>Khi Solar One Solar CSP Farm - 100 MW</th>
<th>Upington, Northern Cape</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Developer</strong></td>
<td>Abengoa</td>
</tr>
<tr>
<td><strong>Financing date</strong></td>
<td>06-Nov-12</td>
</tr>
<tr>
<td><strong>Financing closed</strong></td>
<td>$867 million</td>
</tr>
<tr>
<td><strong>Debt providers</strong></td>
<td>International Finance Corporation (World Bank), Development Bank of Southern Africa</td>
</tr>
<tr>
<td><strong>Equity investors</strong></td>
<td>Abengoa, Industrial Development Corporation, Black Economic Empowerment program</td>
</tr>
<tr>
<td><strong>Legal Advisors</strong></td>
<td>Norton Rose (Abengoa, Industrial Development Corporation), DLA Piper (Abengoa), Webber Wentzel in partnership with Linklaters (International Finance Corporation, Development Bank of Southern Africa)</td>
</tr>
<tr>
<td><strong>Project equipment/services providers</strong></td>
<td>Abengoa (equipment supply, EPC and O&amp;M)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Kaxu Solar One Solar CSP Farm - 50 MW</th>
<th>Pofadder, Northern Cape</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Developer</strong></td>
<td>Abengoa</td>
</tr>
<tr>
<td><strong>Financing date</strong></td>
<td>06-Nov-12</td>
</tr>
<tr>
<td><strong>Financing closed</strong></td>
<td>$433 million</td>
</tr>
<tr>
<td><strong>Debt providers</strong></td>
<td>International Finance Corporation (World Bank), Development Bank of Southern Africa</td>
</tr>
<tr>
<td><strong>Equity investors</strong></td>
<td>Abengoa, Industrial Development Corporation, Black Economic Empowerment program</td>
</tr>
<tr>
<td><strong>Legal Advisors</strong></td>
<td>Norton Rose (Abengoa, Industrial Development Corporation), DLA Piper (Abengoa), Webber Wentzel in partnership with Linklaters (International Finance Corporation, Development Bank of Southern Africa)</td>
</tr>
<tr>
<td><strong>Project equipment/services providers</strong></td>
<td>Abengoa (equipment supply, EPC and O&amp;M)</td>
</tr>
</tbody>
</table>
Window two

On 21 May 2012, the South African government awarded preferred bidder status to 19 of the 79 proposed projects for Window 2 of the Department of Energy’s REIPPP. The 19 preferred bidders consisted of nine solar PV, seven wind, two small hydro and one solar CSP power project with a combined capacity of 1,044 MW. Wind and solar PV accounted for 94% of the total capacity awarded preferred bidder status.

The core information concerning each project finance deal is highlighted in the tables below.

**Average tariffs:** The average tariffs for wind, solar PV and solar CSP projects in Window 2 decreased significantly compared with Window 1. Wind tariffs decreased 22% from ZAR 1.14 ($0.14) per kWh to ZAR 0.89 ($0.11) per kWh, solar PV decreased 40% from ZAR 2.75 ($0.33) per kWh to ZAR 1.65 ($0.20) per kWh and solar CSP fell 6% from ZAR 2.68 ($0.32) per kWh to ZAR 2.51 ($0.30) per kWh.

**International sponsors:** South African renewable energy project development and financing remained reliant on foreign direct investment. The two small-scale hydro power projects were the only that were entirely sponsored by local firms. All of the wind and solar projects are majority-owned by European utilities such as EDF, GDF SUEZ, Enel or international independent power producers such as Acciona, ACWA Power, Scatec Solar, Solairedirect, SolarReserve and SunEdison.

**Local sponsors:** The South African government encouraged foreign project developers to cooperate with Broad Based Black Empowerment Entities (BBBEE)* and awarded bid round points based on contenders’ commitment to local socio-economic development. Two thirds of Window 2 projects are partially owned by community trusts or local non-profit organisations. Typically, these entities own 5%-10% stakes in projects.

**Financial close:** The 19 projects attracted around $3.4 billion in equity and debt financing. The majority of projects achieved financial close and signed their Power Procurement Agreements, Direct Agreements, Implementation Agreements, and Connection Agreements in late spring 2013, about half a year later than originally planned. The last project to reach financial close was SunEdison’s 60 MW Boshoff PV plant, which secured $185 million debt financing from the Overseas Private Investment Corporation in November 2013.

**Financing terms:** The most common debt-to-equity ratio was 75:25, in line with the ratio observed in Window 1 projects that reached financial close in November 2012. The average debt term is construction plus 15-17 years.

**Largest transaction:** The largest project finance transaction was the $565 million raised by sponsors to support construction and operation of the 50 MW Bokpoort Solar CSP Farm in Northern Cape. The sponsors are Saudi Arabia-based ACWA Power (40%), Public Investment Corporation (25%), Lereko Investments (13%), Local Community Trust (5%), and Kurisani (5%). The project - the world’s first CSP plant to have more than nine hours of storage - was financed with a ZAR 3 billion ($303 million) debt package provided by ABSA, Investec and Old Mutual. The debt has a tenor of 19.5 years. The debt-to-equity ratio is 53:47.

**Local debt providers:** Debt providers to Window 2 projects were primarily major South African banks such as Investec, Standard Bank, Rand Merchant bank, Nedbank, ABSA and Industrial Development Corporation. Due to exchange rate risks, foreign commercial banks were still unable to offer pricing that is competitive with South African banks.

**Development banks:** Two US-based development banks provided debt financing in this Window. The International Finance Corporation, which financed two solar CSP plants in Window 1, provided debt to the 139 MW Amakhala Emoyeni (Phase 1) Wind Farm, while the Overseas Private Investment Corporation (OPIC) invested in SunEdison’s 60 MW Boshoff solar plant. This is the first time OPIC has invested in South Africa’s renewable energy sector.

**Legal advisors:** Due to the involvement of foreign power producers in the local market, both international and local law firms advised on project finance transactions. Trinity International LLP was the most active law firm, advising on six transactions, followed by White & Case, Baker & McKenzie, Norton Rose Fulbright, Chadbourne & Parke, DLA Piper, Linklaters & Webber Wentzel. Local law firm ENSafrica advised on four transactions.
### South African wind energy project finance deals (window two) (continued)

**GOUDA WIND FARM - 138MW**

- **Developer:** Acciona Energia SA
- **Financing Date:** July 2013
- **Financing Volume:** $270 million
- **Debt Providers:** Investec plc / Nedbank Ltd. / Rand Merchant Bank
- **Equity Investors:** Acciona Energia SA (51%) / Aveng Group (29%) / Two Local Organisations (20%)
- **Legal Advisors:** Trinity International LLP / White & Case LLP
- **Project Equipment/Services Providers:** Acciona Wind Power

**TSITSIKAMMA COMMUNITY WIND FARM - 94.8MW**

- **Developer:** Cennergi / Watt Energy
- **Financing Date:** June 2013
- **Financing Volume:** $223 million
- **Debt Providers:** Nedbank Ltd.
- **Equity Investors:** Cennergi (Pty) Ltd. (75%) / Watt Energy (15%) / Tsitsikamma Community Trust (10%)
- **Legal Advisors:** AZB & Partners / Norton Rose Fulbright / DLA Piper LLP
- **Project Equipment/Services Providers:** Vestas Wind Systems A/S

**WEST COAST 1 WIND FARM - 94MW**

- **Developer:** Moyeng Energy / GDF Suez
- **Financing Date:** June 2013
- **Financing Volume:** $210 million
- **Debt Providers:** Investec plc / Development Bank of Southern Africa / Nedbank Ltd.
- **Equity Investors:** GDF Suez (43%) / Investec (34.5%) / Kagiso Tiso Holdings’ Tiso Resources division (20%) / A Community Trust (2.5%)
- **Legal Advisors:** Linklaters LLP / Norton Rose Fulbright / Chadbourne & Parke LLP
- **Project Equipment/Services Providers:** Vestas Wind Systems A/S

**GRASSRIDGE WIND FARM - 59.8MW**

- **Developer:** EDF Energies Nouvelles SA
- **Financing Date:** June 2013
- **Financing Volume:** $122.3 million
- **Debt Providers:** ABSA / Industrial Development Corporation
- **Equity Investors:** EDF Energies Nouvelles SA (60%) / Industrial Development Corporation (14%) / Grassridge Winds of Change Community Trust (26%)
- **Legal Advisors:** Baker & McKenzie LLP / ENSafrica
- **Project Equipment/Services Providers:** Vestas Wind Systems A/S

**WAANEX WIND FARM - 23.4MW**

- **Developer:** EDF Energies Nouvelles SA
- **Financing Date:** June 2013
- **Financing Volume:** $61 million
- **Debt Providers:** ABSA / Industrial Development Corporation
- **Equity Investors:** EDF Energies Nouvelles SA / Industrial Development Corporation of South Africa Ltd. / Makana Winds of Change
- **Legal Advisors:** Baker & McKenzie LLP / ENSafrica
- **Project Equipment/Services Providers:** Vestas Wind Systems A/S

**CHABA WIND FARM - 20.6MW**

- **Developer:** EDF Energies Nouvelles SA
- **Financing Date:** June 2013
- **Financing Volume:** $43 million
- **Debt Providers:** ABSA / Industrial Development Corporation
- **Equity Investors:** EDF Energies Nouvelles SA / Industrial Development Corporation / Chaba Winds of Change
- **Legal Advisors:** Baker & McKenzie LLP / ENSafrica
- **Project Equipment/Services Providers:** Vestas Wind Systems A/S
South African solar photovoltaic project finance deals (window two)

**JASPER SOLAR PV PROJECT - 75MW**

<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing Date</th>
<th>Financing Volume</th>
<th>Debt Providers</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Equity Investors</th>
<th>Project Equipment/Services Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>SolarReserve Inc. / Google Inc. / PEACE Foundation / Development Bank of Southern Africa / Kensani Group / Intikon Energy / Public Investment Corporation (PIC)</td>
<td>Ingeteam</td>
</tr>
</tbody>
</table>

**DREUNBERG SOLAR PV FARM - 69.6MW**

<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing Date</th>
<th>Financing Volume</th>
<th>Debt Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scatec Solar</td>
<td>May 2013</td>
<td>$255 million</td>
<td>Standard Bank Group Ltd.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equity Investors</th>
<th>Project Equipment/Services Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norfund / Scatec Solar AS / Standard Bank Group Ltd. / Old Mutual Life Assurance Company Ltd. / Simacel</td>
<td>SMA Solar Technology AG</td>
</tr>
</tbody>
</table>

**SOLAR CAPITAL DE AAR 3 SOLAR PV FARM - 75MW**

<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing Date</th>
<th>Financing Volume</th>
<th>Debt Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moncada Energy Group Srl</td>
<td>May 2013</td>
<td>$250 million</td>
<td>Standard Bank Group Ltd.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equity Investors</th>
<th>Project Equipment/Services Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moncada Energy Group Srl / Solar Capital Ltd.</td>
<td></td>
</tr>
</tbody>
</table>

**BOSHOFF SOLAR PV FARM - 60MW**

<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing Date</th>
<th>Financing Volume</th>
<th>Debt Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>SunEdison</td>
<td>Nov 2013</td>
<td>$250 million</td>
<td>Overseas Private Investment Corp.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equity Investors</th>
<th>Project Equipment/Services Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>SunEdison Inc. (51%) / Public Investment Corporation (19%) / Nehawu Investment Holdings (20%) / a community trust administered by Kurisani (Lovelife’s investment arm) (10%)</td>
<td></td>
</tr>
</tbody>
</table>

**SISHEN SOLAR PV FARM - 74MW**

<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing Date</th>
<th>Financing Volume</th>
<th>Debt Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acciona Energia SA</td>
<td>June 2013</td>
<td>$233 million</td>
<td>Investec plc. / Nedbank Ltd.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equity Investors</th>
<th>Project Equipment/Services Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acciona Energia SA (51%)/ Aveng Group (29%)/ Dibeng Trust (10%)/ A nonprofit organisation (10%)</td>
<td>JinkoSolar / Ingeteam</td>
</tr>
</tbody>
</table>

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CONTINUED ➤
South African solar photovoltaic project finance deals (window two) (continued)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Developer</th>
<th>Financing Date</th>
<th>Financing Volume</th>
<th>Debt Providers</th>
<th>Equity Investors</th>
<th>Legal Advisors</th>
<th>Project Equipment/Services Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPINGTON SOLAR PV FARM - 8.9MW</td>
<td>Enel Green Power / Sharp</td>
<td>N/D*</td>
<td>$20 million</td>
<td>Enel Green Power / Sharp</td>
<td>Enel Green Power / Sharp</td>
<td>Gefran SA / Enertronica / Terni Energia</td>
<td></td>
</tr>
</tbody>
</table>

* The project cost was estimated and, as of December 2013, construction was underway. Enel Green Power and Sharp might be financing the project from their balance sheet.
### South African CSP solar project finance deals (window two)

<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing Date</th>
<th>Financing Volume</th>
<th>Debt Providers</th>
<th>Equity Investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOKPORTE SOLAR CSP FARM - 50MW</td>
<td>June 2013</td>
<td>$565 million</td>
<td>Investec / ABSA Capital / Old Mutual Specialized Finance</td>
<td>ACWA Power (40%) / Lereko Investments (13%) / Local Community Trust (5%) / Kurisani (5%) / Lereko Metier Funds (12%) / Public Investment Corporation (25%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Legal Advisors</th>
<th>Project Equipment/ Services Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chadbourne &amp; Parke LLP / Fasken Martineau DuMoulin LLP</td>
<td>TSK Electronica y Electricidad / Acciona Infraestructuras, Acciona Ingenieria / Sener Ingenieria y Sistemas / Crowie Concessions (Pty) Ltd. / NOMAC (O&amp;M) / Invest in Africa Holdings (O&amp;M)</td>
</tr>
</tbody>
</table>

### South African hydro power project finance deals (window two)

<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing Date</th>
<th>Financing Volume</th>
<th>Debt Providers</th>
<th>Equity Investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEUSBERG HYDRO ELECTRIC PROJECT A - 10MW</td>
<td>May 2013</td>
<td>$43 million</td>
<td>Nedbank Ltd.</td>
<td>Hydro Tasmania / Hydro 1 SA / Old Mutual / A Community Trust funded by the Industrial Development Corporation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Legal Advisors</th>
<th>Project Equipment/ Services Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/D</td>
<td>Entura, a subsidiary of Hydro Tasmania, (engineering and design) / EPC (electrical and mechanical) / Kaplan (turbine provider) / HPP (equipment supply) / Wright Dixon (maintenance)</td>
</tr>
</tbody>
</table>

### STORTEMELK HYDRO ELECTRIC PROJECT - 4.3MW

<table>
<thead>
<tr>
<th>Developer</th>
<th>Financing Date</th>
<th>Financing Volume</th>
<th>Debt Providers</th>
<th>Equity Investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>NuPlanet Project Development</td>
<td>N/D</td>
<td>N/D</td>
<td>N/D</td>
<td>NuPlanet Project Development</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Legal Advisors</th>
<th>Project Equipment/ Services Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/D</td>
<td>Aurecon (consulting engineer), Eigenbau (civil construction), Andritz (water-to-wire turbine and generator), TMC Operations &amp; Maintenance (operations and maintenance)</td>
</tr>
</tbody>
</table>
Window three

On 4 November 2013, the South African government awarded preferred bidder status to 17 of the 93 proposed projects for Window 3 of the Department of Energy’s REIPPP. The 17 preferred bidders consisted of seven wind, six solar PV, two CSP, one biomass and one landfill-gas-to-electricity project with a combined capacity of 1,456 MW. Wind and solar PV accounted for 84% of the total capacity awarded preferred bidder status. The 17 projects in Window 3 will require an aggregate investment of around ZAR 44.4 billion (US$4.5 billion).

Details of project finance deals for each project are highlighted in a table on the following pages. The most significant trends are outlined below:

Average tariffs: The average tariffs for wind, solar PV and solar CSP projects in Window 3 decreased significantly compared with Window 2: wind tariffs decreased 18% from ZAR 0.90 (US$0.11) per kWh in Window 2 to ZAR 0.74 (US$0.07) per kWh in Window 3; solar PV decreased 40% from ZAR 1.65 (US$0.20) per kWh to ZAR 0.99 (US$0.09) per kWh; and solar CSP fell 35% from ZAR 2.51 (US$0.30) per kWh to ZAR 1.64 (US$0.15) per kWh. Between Windows 1 and 2, average tariffs for wind, solar PV and solar CSP projects declined 22%, 40% and 6% respectively.

Financial close: The 17 projects were initially expected to reach financial close by the middle of 2014, but the deadline has since been extended to 24 November 2014. However, it is likely the deadline might be missed again after state utility Eskom raised concerns over the cost of connection to the grid.

Expected financing structure: According to project information documents submitted to the National Energy Regulator of South Africa (NERSA), the 17 projects will either be funded on balance sheet or with non-recourse project debt finance facilities. Italian utility Enel Green Power is expected to finance their EUR630 million ($866 million) investment in four solar PV and two wind farms on balance sheet. Projects to be funded with non-recourse project debt finance facilities are expected to have a debt-to-equity ratio of 75:25, in line with the 75:25 split observed in projects in Windows 1 and 2. The debt term has not been disclosed.

International sponsors: All of the seven wind power projects in Window 3 are majority-owned by European and Chinese investors such as Enel Green Power, Mainstream Renewable Power and China Longyuan Power Group. Italian utility Enel Green Power is also the majority sponsor of four of the solar PV farms with a combined capacity of 285 MW.

Local sponsors: Mulilo Renewable Energy is the most active sponsor, participating in the Mulilo Sonnedix Prieska and Mulilo Prieska solar PV farms alongside French investors Sonnedix SA and Total SA respectively. Mulilo Renewable Energy only owns a non-controlling stake in these assets.

Debt providers: Debt financing is expected to be sourced primarily from local banks such as ABSA Capital, Development Bank of Southern Africa, Investec, Nedbank and Standard Bank, and multilateral finance organisations such as the African Development Bank and the World Bank’s International Finance Corporation.

If Irish IPP Mainstream Renewable Power manages to reach financial close for the Khobab (138 MW), Loeriesfontein (138 MW), and Noupoort (79 MW) wind farms - with a group of mandated lead arrangers comprising Barclays plc, Development Bank of Southern Africa and Export Kredit Fonden - it will be the first time that a foreign commercial bank (Barclays) and an export credit agency (Expost Kredit Fonden) have financed a project under the REIPPP. Due to exchange rate risks and rand-denominated power purchase agreements with state utility Eskom, foreign commercial banks were unable to offer pricing that was competitive with South African banks for projects in Windows 1 and 2.
### South African wind power project finance deals (window three)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Developer</th>
<th>Expected debt-to-equity ratio</th>
<th>Financing Volume</th>
<th>Expected Debt Providers</th>
<th>Project Sponsor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KHOBAB WIND FARM - 138MW</strong></td>
<td>Mainstream Renewable Power / Genesis Eco-Energy</td>
<td></td>
<td>$285 million</td>
<td>Barclays plc, Development Bank of Southern Africa, Eksport Kredit Fonden</td>
<td>Mainstream Renewable Power (40%), Old Mutual Life Assurance Company (30%), Genesis Eco-Energy (15%), Thebe Investment Corp (10%), Khoabab Renewable Energy Community Trust (5%)</td>
</tr>
<tr>
<td><strong>LOERIESFONTEIN 2 WIND FARM - 138MW</strong></td>
<td>Mainstream Renewable Power</td>
<td></td>
<td>$285 million</td>
<td>Barclays plc, Development Bank of Southern Africa, Eksport Kredit Fonden</td>
<td>Mainstream Renewable Power (40%), Old Mutual Life Assurance Company (30%), Genesis Eco-Energy (15%), Thebe Investment Corp (10%), Loeriesfontein Renewable Energy Community Trust (5%)</td>
</tr>
<tr>
<td><strong>GIBSON BAY WIND FARM - 110MW</strong></td>
<td>Red Cap Investments</td>
<td></td>
<td>$229 million</td>
<td>Enel Green Power (60%) / Gibson Bay Community Trust (40%)</td>
<td></td>
</tr>
<tr>
<td><strong>NOJOLI WIND FARM - 87MW</strong></td>
<td>African Clean Energy Developments</td>
<td></td>
<td>$181 million*</td>
<td>Vestas Wind Systems A/S</td>
<td>Enel Green Power (60%) / Pele Green Energy (30%) / Nojoli Wind Farm Community Trust (10%)</td>
</tr>
<tr>
<td><strong>NOUPOORT WIND FARM - 79MW</strong></td>
<td>Mainstream Renewable Power / Genesis Eco-Energy</td>
<td></td>
<td>$163 million</td>
<td>Industrial Development Corporation of South Africa / Nedbank</td>
<td>Mainstream Renewable Power (40%), Old Mutual Life Assurance Company (30%), Genesis Eco-Energy (15%), Thebe Investment Corp (10%), Noupoort Renewable Energy Community Trust (5%)</td>
</tr>
<tr>
<td><strong>LONGYUAN MULILU DE AAR MAANHAARBERG WIND FARM - 96MW</strong></td>
<td>Longyuan South Africa Renewables / Mulilo Wind Enterprises</td>
<td>75/25</td>
<td>n/a</td>
<td>Guodian United Power Technology Co. Ltd / China Longyuan Power Group</td>
<td>Longyuan South Africa Renewables (60%) / Mulilo Wind Enterprises (20%) / Mulilo De Aar Community Trust (12.5%) / ETU Energy Resources (7.5%)</td>
</tr>
</tbody>
</table>

* Estimated by Clean Energy Pipeline based on the total project cost of ZAR2.25 billion ($229 million) of the 110MW Gibson Bay Wind Farm.
## South African wind power project finance deals (window three) (continued)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Developer</th>
<th>Expected Debt-to-equity Ratio</th>
<th>Financing Volume</th>
<th>Expected Debt Providers</th>
<th>Project Sponsor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longyuan Mulilo De Aar 2 North Wind Farm - 139MW</td>
<td>Longyuan South Africa Renewables / Mulilo Wind Enterprises</td>
<td>75/25</td>
<td>n/a</td>
<td>Industrial Development Corporation of South Africa / Nedbank</td>
<td>Longyuan South Africa Renewables (60%) / Mulilo Wind Enterprises (20%) / Mulilo De Aar 2 North Community Trust (12.5%) / Mulilo De Aar 2 South Community Trust t/a Ule Energy Resources (7.5%)</td>
</tr>
</tbody>
</table>

## South African solar CSP project finance deals (window three)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Developer</th>
<th>Expected Debt-to-equity Ratio</th>
<th>Financing Volume</th>
<th>Expected Debt Providers</th>
<th>Project Sponsor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xina Solar One CSP Plant - 100MW</td>
<td>Abengoa Solar</td>
<td>40%</td>
<td>$908 million</td>
<td>African Development Bank / Clean Technology Fund / International Finance Corporation / Canada Climate Change Program</td>
<td>Abengoa Solar (40%) / Industrial Development Corporation of South Africa (20%) / Government Employees Pension Fund (20%) / A local community trust (20%)</td>
</tr>
<tr>
<td>Karoshoeck CSP Plant - 100MW</td>
<td>Emvelo Group / FG.de Group</td>
<td>50%</td>
<td>$900 million*</td>
<td>Nedbank, ABSA Capital, Investec, Development Bank of Southern Africa, Industrial Development Corporation of South Africa, Standard Bank</td>
<td>Emvelo Group (15%) / Industrial Development Corporation of South Africa (20%) / Cobra ACS (20%) / Public Investment Corporation (20%) / Investec (10%) / Karoshoeck Community Trust (15%)</td>
</tr>
</tbody>
</table>

*Estimated by Clean Energy Pipeline based on the total project cost of approx. $900 million of the 100MW Xina Solar One CSP Plant

## South African biomass / landfill gas project finance deals (window three)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Developer</th>
<th>Expected Debt-to-equity Ratio</th>
<th>Financing Volume</th>
<th>Expected Debt Providers</th>
<th>Project Sponsor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mkuzé Biomass Plant - 160MW</td>
<td>Building Energy</td>
<td>60/40</td>
<td>$98 million*</td>
<td></td>
<td>Building Energy (51%) / Charl Senekal Suiker Trust (30%) / H1 Capital (16.5%) / Local community trust (2.5%)</td>
</tr>
<tr>
<td>Johannesburg Landfill Gas to Electricity Plant - 180MW</td>
<td>Ener-G Group</td>
<td>58/42</td>
<td>$30 million</td>
<td></td>
<td>Ener-G Group (51.657%) / CEF Pty Ltd (28.275%) / Secure Rock Enterprises (17.55%) / Ener-G Educational Community Trust (2.5%)</td>
</tr>
</tbody>
</table>
This directory lists every investor, acquirer, project sponsor, law firm and financial advisor that has executed or advised on a venture capital, private equity, project finance or M&A transaction in the African clean energy sector since the beginning of 2012. The directory is based on transactions tracked by Clean Energy Pipeline’s deal data team.

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Website</th>
<th>Investment Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3i Group Plc</strong></td>
<td>London, UK</td>
<td><a href="http://www.3i.com">www.3i.com</a></td>
<td>M&amp;A Acquirer</td>
</tr>
<tr>
<td><strong>Abengoa SA</strong></td>
<td>Seville, Spain</td>
<td><a href="http://www.abengoa.com">www.abengoa.com</a></td>
<td>Project sponsor</td>
</tr>
<tr>
<td><strong>Absa Capital</strong></td>
<td>Johannesburg, South Africa</td>
<td><a href="http://www.absacapital.com">www.absacapital.com</a></td>
<td>Project sponsor</td>
</tr>
<tr>
<td><strong>ADM Capital</strong></td>
<td>Hong Kong, China</td>
<td><a href="http://www.admcap.com">www.admcap.com</a></td>
<td>PE - Development Capital</td>
</tr>
<tr>
<td><strong>AE-AMD Renewable Energy Ltd.</strong></td>
<td>Cape Town, South Africa</td>
<td><a href="http://www.ae-amd.co.za">www.ae-amd.co.za</a></td>
<td>Project sponsor</td>
</tr>
<tr>
<td><strong>Acciona Energia SA</strong></td>
<td>Madrid, Spain</td>
<td><a href="http://www.acciona-energia.com">www.acciona-energia.com</a></td>
<td>Project sponsor</td>
</tr>
<tr>
<td><strong>AECI</strong></td>
<td>Johannesburg, South Africa</td>
<td><a href="http://www.aeci.co.za">www.aeci.co.za</a></td>
<td>M&amp;A Acquirer</td>
</tr>
<tr>
<td><strong>Aeolus Kenya</strong></td>
<td>Nairobi, Kenya</td>
<td><a href="http://www.aeoluskenya.com">www.aeoluskenya.com</a></td>
<td>Project sponsor</td>
</tr>
<tr>
<td><strong>Africa EMS Mpanga Ltd.</strong></td>
<td>Kampala, Uganda</td>
<td><a href="http://www.africemsp.org">www.africemsp.org</a></td>
<td>Project sponsor</td>
</tr>
<tr>
<td><strong>Africa Finance Corp.</strong></td>
<td>Lagos, Nigeria</td>
<td><a href="http://www.africafc.org">www.africafc.org</a></td>
<td>Debt provider</td>
</tr>
<tr>
<td><strong>Africa Geothermal International Ltd.</strong></td>
<td>Nairobi, Kenya</td>
<td><a href="http://www.africa-geothermal.com">www.africa-geothermal.com</a></td>
<td>Project sponsor</td>
</tr>
</tbody>
</table>
ARIYA CAPITAL GROUP
develops, structures, invests in and manages clean energy and infrastructure projects throughout sub-Saharan Africa.

Ariya’s value proposition focuses on three pillars: superior financial returns, positive social impact and quantifiable environmental benefits.

www.ariyacapital.com
info@ariyacapital.com

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info@ariyacapital.com
BioTherm Energy (Pty) Limited is an African renewable energy development platform and one of South Africa’s leading renewable energy developers. In October 2007 BioTherm commissioned its 4.2 MW Biogas Project and currently has 27MW of wind and 21.5MW of solar in operation. The company was also awarded four solar power purchase agreements in 2013 under the Zambia Solar program and more recently in 2014 it has been awarded a preferred bidder in Burkina Faso. BioTherm is actively developing several other projects throughout Africa.

BioTherm is committed to be the leading developer of renewable energy projects in Africa and has a strong desire to build sustainable projects. BioTherm also ensures that their projects catalyze sustainable economic development in local communities to ensure a better future for all.

Contact:
Jasandra Nyker
Chief Executive Officer
JNyker@biothermenergy.com
+27 (0) 11 367 4600
Chadbourne & Parke LLP
New York, NY, USA
www.chadbourne.com
ADVISORY FOCUS: Legal - project finance

Climate Investment Funds
Washington, DC, USA
www.climateinvestmentfunds.org
INVESTMENT FOCUS: Debt provider

Credit Suisse Group AG
Zurich, Switzerland
www.credit-suisse.com
INVESTMENT FOCUS: Debt provider

Cobra Energia
Madrid, Spain
www.grupocobra.com
INVESTMENT FOCUS: Project sponsor
ABOUT: Cobra Energia, the affiliate responsible for the energy business within Grupo Cobra, has evolved to become a world leader thanks to its ability and determination to develop, build and operate energy infrastructures requiring a high level of service, based on excellence in integration, technological innovation and financial strength.
CONTACT: Jaime Martinez
Business Development Manager, EMEA
jaime.martinez@grupocobra.com
+34 91 4569500

Condor Electronics
Algiers, Algeria
www.condor.dz
INVESTMENT FOCUS: M&A Acquirer, Project sponsor

Denham Capital Management LP
www.denhamcapital.com
Denham Capital is a leading energy and resources-focused global private equity firm with more than $7.9 billion of invested and committed capital across seven fund vehicles with offices in London, Boston, Houston, São Paulo and Perth. The firm makes direct investments in the energy and resources sectors, including businesses involving power generation, oil and gas, and mining, across the globe and all stages of the corporate lifecycle. Denham’s investment professionals apply deep operational and industry experience and work in partnership with management teams to achieve long-term investment objectives.

Contact:
Justin DeAngelis
Director
justin.deangelis@denhamcapital.com
+1 (617) 531 4962

Denham Capital is a leading energy and resources-focused global private equity firm with more than $7.9 billion of invested and committed capital across seven fund vehicles with offices in London, Boston, Houston, São Paulo and Perth. The firm makes direct investments in the energy and resources sectors, including businesses involving power generation, oil and gas, and mining, across the globe and all stages of the corporate lifecycle. Denham’s investment professionals apply deep operational and industry experience and work in partnership with management teams to achieve long-term investment objectives.

Contact:
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The African Renewable Energy Alliance is a member-driven network to exchange information and consult about policies, technologies and financial mechanisms for the accelerated uptake of renewable energies in Africa. Join us!

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www.red-cap.co.za
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www.ren.pt
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www.sgurrenergy.com
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Cleantech and renewables financial analyst
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• Understanding of implications of using wind energy on a large scale in a Southern African environment
• Determining the most suitable applications for wind energy
• Determining the most appropriate scale of implementation
• Obtaining all necessary information for the effective implementation of wind energy
• Investigating the sustainability of wind energy in a Southern African context

CONTACT:
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Director
francois@sarge.co.za
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Standard Bank (Mauritius)
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ABOUT:
Wind Prospect Africa, currently active in South Africa and Kenya, form part of the Wind Prospect Group. After execution of their respective contracts, Wind Prospect has managed project implementation of 130 MW in South Africa - supported by our experience from over 130 projects globally.

The business has successfully developed, constructed and consulted on wind farm projects around the world. With over two decades of experience, our team of experts support organisations by providing essential services in finding, developing, building, operating, buying and selling renewable energy projects.

The next step in Wind Prospect’s service offering to the maturing South African market is Operations/Asset Management where we currently hold contracts globally for 800 MW. We aim to follow the project lifecycle to expand this service in Africa in 2015.

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