Financing Renewables in Southern Africa

Oxpeckers
We address climate risk and unlock innovation to create value for organisations.
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</table>
1.0 Overview of the renewables project spectrum
The energy generation system

Electricity generation mix in Southern Africa, by source, 2019

There is a wide range of renewable energy projects

**Example of resources**
- Wind
- Solar
- Hydro
- Biomass
- Wave
- Tidal
- Geothermal

**Other characteristics**
- Grid-connected utility scale
- Large off-grid systems (private wire)
- Small behind the meter

Source: [IRENA, 2023a](https://www.irena.org)

Note: TWh = terawatt hours
## Typical activities and indicative timeline

<table>
<thead>
<tr>
<th>Stage</th>
<th>Activities</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 1</strong></td>
<td>Early stage development</td>
<td>1 - 3 years</td>
</tr>
<tr>
<td></td>
<td>Resource assessment</td>
<td>3 – 5 years</td>
</tr>
<tr>
<td></td>
<td>Land options</td>
<td>1 to 3 years</td>
</tr>
<tr>
<td></td>
<td>Early stage community and environmental assessments</td>
<td>3 months to years</td>
</tr>
<tr>
<td><strong>Stage 2</strong></td>
<td>Construction</td>
<td>20 – 30 years</td>
</tr>
<tr>
<td></td>
<td>Before connecting to the network, test that generation performance standards are met / not negative impact on network</td>
<td>&lt;1 year</td>
</tr>
<tr>
<td><strong>Stage 3</strong></td>
<td>Commissioning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Civil procurement and installation</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 4</strong></td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Asset management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Maintenance</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 5</strong></td>
<td>Decommissioning or repowering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Remove or repower</td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Recycle if removed</td>
<td></td>
</tr>
</tbody>
</table>
Who can renewable energy projects sell their output to?

Revenue options / strategies are heavily influenced by the market design and prevailing regulations in each country

• Government auctions (or selling to a single state-owned utility buyer)
• Corporate offtakers (physical or financial arrangement?)*
• Electricity retailers (if they exist)

* Direct “wheeling” of power though open grid access is often not permitted
Spectrum of business models common amongst global renewable energy project proponents

- **Pureplay developer**
  - Sell down part after securing an off-take*, typically for >70% of output. Sell-down 100% upon reaching COD.
  - Typically rely on project finance supported by PPAs

- **Passive asset owner**
  - Sell-down part only upon reaching COD to financial investors often satisfied by stable long term, albeit relatively low returns
  - Maintains majority ownership of assets
  - Adopt a portfolio approach to financing
  - Target higher returns / investing in risk management capabilities
  - May have higher merchant exposure

- **Active asset owner**
  - Active asset owner, but with a retail license

- **Vertically integrated retailer**

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* e.g. Power purchase agreement (PPA) which could take the form of a government reverse auction or corporate buyer
2.0 Financing across the project life cycle
## Typical finance sources across the project lifecycle

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAGE 1</td>
<td>Development</td>
<td>1 - 3 years</td>
</tr>
<tr>
<td>STAGE 2</td>
<td>Construction</td>
<td>3 – 5 years</td>
</tr>
<tr>
<td>STAGE 3</td>
<td>Commissioning</td>
<td>1 to 3 years</td>
</tr>
<tr>
<td>STAGE 4</td>
<td>Operation</td>
<td>3 months to years</td>
</tr>
<tr>
<td>STAGE 5</td>
<td>Decommissioning</td>
<td>20 – 30 years</td>
</tr>
<tr>
<td>STAGE 6</td>
<td></td>
<td>&lt;1 year</td>
</tr>
</tbody>
</table>

### Early stage development
- Developer Equity
- TA
- Innovation grants

### Construction
- Construction finance
- Equity
- Trade finance

### Commissioning
- Project finance (but dependent on business model)
- Equity (sources vary depending on the business model)
Given the risk profile of investment in infrastructure in developing countries, blended finance is prominent

Blended finance consist of two or more sources of finance from:

- Development agencies and multi-donor funds
- Multilateral development banks (MDBs) and development finance institutions (DFIS)
- Impact investors
- Commercial investors
- Philanthropic organisations

Given the risk profile of investment in infrastructure in developing countries, blended finance is prominent.
3.0 Financing sources and their efficacy
The cost of debt in Africa is generally high due to a range of real and perceived risk factors, including:

• Credit rating of countries
• Political, policy and regulatory risk
• Currency risk
• Relatively small scale of projects

To unlock capital, projects must be sufficiently de-risked. Thus the needs for:

• collaboration by private and public finance (i.e. spreading the risk) – also referred to as blended finance. This may also include strategies to source finance in local currency, to reduce currency risk.
• the provision of debt guarantees by governments or DFIs at reduced rates
• insurance cover
What other factors may impact bankability?

Confidence of investors/financiers may also be impacted by concerns pertaining to:

• whether, with a change in administration, contractual obligations such as power-purchase agreements will be honoured?

• financial standing of monopolistic grid infrastructure owner-operators?

• market access – how supportive is the regulatory market to support e.g. corporate PPAs?

• corruption, especially for philanthropic sources (i.e. will the intended beneficiaries receive the value?)
# Types and sources of financial investment

<table>
<thead>
<tr>
<th>Type</th>
<th>Sources of debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt</td>
<td>Private banks</td>
</tr>
<tr>
<td>• Project finance</td>
<td>• Domestic governments / development banks</td>
</tr>
<tr>
<td>• Corporate finance and (green) bond market</td>
<td>• Foreign governments</td>
</tr>
<tr>
<td>• Trade finance</td>
<td>• Bi- and multi-lateral development agencies / development banks</td>
</tr>
<tr>
<td>Grants</td>
<td></td>
</tr>
<tr>
<td>• Independent power producer</td>
<td></td>
</tr>
<tr>
<td>• Pension and private equity funds</td>
<td></td>
</tr>
<tr>
<td>• Government agencies</td>
<td></td>
</tr>
</tbody>
</table>

*Non-financial instruments include Technical Advisory (TA) packages that may reduce the risk to investors in high risk sectors*
What are the differences in the outcomes sought by different sources?

**Commercial / private finance**
- Higher return on investment expected by equity
- Debt financiers have a shorter investment horizon
- Lower risk tolerance by both debt and equity
- ESG priorities influenced by off-taker

**Development / public finance**
Strong focus on economic development:
- Local content
- Job creation
- Private capital invested
- New capabilities that may improve productivity

Other ESG considerations may also be central in many (not all) bi- and multilateral development finance packages.
What does a good project look like?

**Finances**
- Evidence of how money has been spent

**Project delivery**
- Time and outcomes

**Social licence to operate**
- Is the project well liked and well regarded?

**Co-benefits**
- What was promised and what was delivered?
4.0 South Africa – a case study
Framework applied to the case study

Regulatory framework
- Approval process for registration of generators*
- How many markets exist to sell output?
- Who pays generators for output in each?

Business model
- Revenue options
- Financing structure

Outcome

Government policy / procurement process / incentives

* And other electricity market participants if applicable and the relevant size categories (and exceptions as may apply)
# South African Renewable Energy IPP Procurement Programme (REIPPPP)

## Regulatory context
- State controlled monopoly – distribution and generation
- Retailing regulated through municipalities (local government)
- Sub-100MW plants can operate without a licence
- Eskom / government the only buyer of power

## IPP Revenue strategies
- Participation in tenders run by the state the only options
- Direct access to the corporate market not supported

## Financing structures
- No subsidies
- Initial approach of providing feed-in tariffs replaces.
- Program participants underwritten by private and development finance institutions

## Process
- Initial 3 rounds:
  - Signalled momentum with each new round announced around the time of the previous rounds winners were announced
- A further 3 rounds were launched:
  - Some loss of momentum during round 4 as round 3 projects faced grid constraints
  - Has it / can it be regained?
Outcomes of the first 3 rounds (August 2011 to July 2014)

- 64 projects awarded to the private sector
- US$14bn private capital committed to the projects
- 3922 MW capacity committed
- 68% drop* in average solar PV tariffs across the three bidding stages
- 42% drop* in average wind tariffs across the three bidding stages

How does this compare to the subsequent rounds and progress towards 2030 target?

* In nominal dollar terms
As at 2018, 6.3GW of wind and solar capacity had been installed or committed / contracted against a 2030 target of 20 GW.

<table>
<thead>
<tr>
<th>Round</th>
<th>Launch date</th>
<th>Total (GW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>March 2021</td>
<td>2.6</td>
</tr>
<tr>
<td>6</td>
<td>April 2022</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Since 2018 the 5th round has been completed and the 6th is underway.

<table>
<thead>
<tr>
<th>Year</th>
<th>Coal</th>
<th>Nuclear</th>
<th>Hydro</th>
<th>Storage (Pumped Storage)</th>
<th>PV</th>
<th>Wind</th>
<th>CSP</th>
<th>Gas / Diesel</th>
<th>Other (Cogen, biomass, landfill)</th>
<th>Embedded Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>39.126</td>
<td>1,860</td>
<td>2,196</td>
<td>2,912</td>
<td>1,474</td>
<td>1,980</td>
<td>300</td>
<td>3,830</td>
<td>499</td>
<td>Unknown</td>
</tr>
<tr>
<td>2019</td>
<td>2,155</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>244</td>
<td></td>
<td>300</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>2020</td>
<td>1,433</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>114</td>
<td>300</td>
<td></td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>2021</td>
<td>1,433</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>300</td>
<td>818</td>
<td></td>
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<td>200</td>
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<tr>
<td>2022</td>
<td>711</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>400</td>
<td></td>
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<tr>
<td>2023</td>
<td>500</td>
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<td></td>
<td></td>
<td>200</td>
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<tr>
<td>2024</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>200</td>
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<tr>
<td>2025</td>
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<td></td>
<td>670</td>
<td>200</td>
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<tr>
<td>2026</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,000</td>
<td>1,500</td>
<td>2,250</td>
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<td>200</td>
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<tr>
<td>2027</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,000</td>
<td>1,600</td>
<td>1,200</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>2028</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,000</td>
<td>1,600</td>
<td>1,800</td>
<td></td>
<td>200</td>
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<tr>
<td>2029</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,000</td>
<td>1,600</td>
<td>2,850</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>2030</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,000</td>
<td>1,600</td>
<td></td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>TOTAL INSTALLED</td>
<td>33,847</td>
<td>1,860</td>
<td>4,696</td>
<td>2,912</td>
<td>7,958</td>
<td>11,442</td>
<td>600</td>
<td>11,930</td>
<td>499</td>
<td>2,600</td>
</tr>
<tr>
<td>Installed Capacity (%)</td>
<td>44.6%</td>
<td>2.5%</td>
<td>6.2%</td>
<td>3.8%</td>
<td>10.5%</td>
<td>15.1%</td>
<td>0.9%</td>
<td>15.7%</td>
<td>0.7%</td>
<td></td>
</tr>
<tr>
<td>Committed / Already Contracted Capacity</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>New Additional Capacity (IRP Update)</td>
<td></td>
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</tbody>
</table>

After more than 10 years, this would deliver approximately 57% of the 2030 target. Thus requiring a further 3 rounds of approximately 2.6 GW each. However, it takes approximately 1 year to award contracts from the date of tender close, whereafter at least 18 months to complete solar project and 2 to 3 years for wind
Current innovations to overcome hurdles

“Packaged” land parcels

Dec 2021 – 20 year leases of Eskom land to private investors for renewable energy generation

• Trial in Mpumalanga to IPPs to create renewable energy projects (bid window from 8 – 29 April 2022).

• land on site or near existing coal-fired power stations for the development of renewable energy projects. This entails proximity to transmission lines and allows Eskom to provide connection up to the nearest network connection point.

• favour generators for size and speed of delivery, in other words the fastest delivery of additional generation capacity to the grid.

• a maximum generation capacity of 100 MW for each project. The capped generation capacity means that plants can operate without a licence, and it allows generators to wheel electricity through the transmission grid as provided by the latest Amendment to the Electricity Regulation Act in 2021.

Green bonds

South African Development Bank’s (DBSA’s) Climate Finance Facility is an example of development finance institution issuing a green bond targeting the Southern African market

World Economic Forum Regional Action Group for Africa Financing the Future of Energy | World Economic Forum (weforum.org)
Spectrum of business models common amongst global renewable energy project proponents

**Pureplay developer**
- Sell down part after securing an offtake*, typically for >70% of output. Sell-down 100% upon reaching COD.
- Typically rely on project finance supported by PPAs.

**Passive asset owner**
- Sell-down part only upon reaching COD to financial investors often satisfied by stable long term, albeit relatively low returns.
- Maintains majority ownership of assets.

**Active asset owner**
- Adopt a portfolio approach to financing.
- Target higher returns / investing in risk management capabilities.
- May have higher merchant exposure.

**Vertically integrated retailer**
- Active asset owner, but with a retail license.

* e.g. Power purchase agreement (PPA) which could take the form of a government reverse auction or corporate buyer.
6.0

Discussion
Key questions

On a per capita basis South Africans has good access to electricity when compared to Nigeria’s 10GW vs South Africa’s 46GW. However, has the focus on distribution vs generation delivered a system that meets the requirements of is 56 million people?

- Per capita?
- Residential vs Private Sector?

How can residual questions (slide 14) be addressed?

How do we ensure maximising environmental and socio-economic benefits of renewable electricity investments, whilst mobilising capital to increase the pace of renewable electricity investment?