Independent Power Producers Procurement Programme (IPPPP)

An Overview

As at 31 March 2019
Executive summary

The purpose of this report is to provide an overview of the activities of the IPPPPP Office for reporting quarter 4 of the 2018/2019 Financial Year (1 January to 31 March 2019).

Our mandate: Procuring energy while contributing to national development objectives

The Department of Energy’s (DoE) Independent Power Producers Procurement Programme (IPPPP) was established at the end of 2010 as one of the South African government’s urgent interventions to enhance South Africa’s power generation capacity.

The Department of Energy (DoE), National Treasury (NT) and the Development Bank of Southern Africa (DBSA) established the IPPPPP Office for the specific purpose of delivering on the IPP procurement programme objectives. In May 2016, a new Memorandum of Agreement (MoA) was agreed by all parties to provide the necessary support to the IPPPPP Office, to implement the IPPPPP, for a further 3-year period.

The primary mandate of the IPPPPP Office is to secure electricity from renewable and non-renewable energy sources from the private sector. However, energy policy and supply is not only about technology, but has a substantial influence also on economic growth and socio-economic development. As such, the IPPPPP has been designed to go beyond the procurement of energy to also contribute to broader national developmental objectives such as job creation, social upliftment and increasing opportunities for economic ownership.

The Integrated Resource Plan (IRP) 2010-2030 provides a long-term plan for electricity generation. It calls for doubling of electricity capacity using a diverse mixture of energy sources, mainly Coal, Gas, Nuclear and Renewables, including large-scale Hydro, the latter which is to be imported from the southern African region.

The IPPPPP is contributing to the security of energy supply and ensuring a diversified energy mix through the procurement of significant additional renewable energy, coal, gas and cogeneration capacity from the private sector to reach the planned IRP target of 29 330 MW by 2025.

Implementation of the IRP 2010-2030 is carried out through Ministerial Determinations, which are regulated by Electricity Regulations on New Generation Capacity. These are released periodically. Once released, the Ministerial Determinations signify the start of a procurement process and, most importantly, contribute to certainty for investors. Determinations of 30 115 MW across all technologies have already been made by the Minister of Energy.

The scale and scope of electricity infrastructure development under the IPPPPP extend beyond the national footprint and necessitates that broader regional linkages and partnerships be established. Active engagement and collaboration interfaces have been developed with, amongst others, the South African Development Community (SADC), African Union (AU) and South African Power Pool (SAPP). Bilateral linkages are also being pursued in support of cross-border project collaboration and capacity support, knowledge sharing and skills enhancement.

Caveat. This report and all analysis include all data reported by IPPs for quarter 4 of 2018/19 FY, as received by 27 April 2019. Any data updates from IPPs after this date will be incorporated and reflected in subsequent reporting periods.

Note 1. Notation indicates additional notes and observations available in Appendix A. Note 2. The Integrated Resource Plan (IRP) 2010-30 was promulgated in March 2011. It was indicated at the time that the IRP should be a “living plan”. The Department of Energy is in the process of updating the IRP and has published Assumptions and Base Case for comment at the end of 2016. Note 3. IRP targets 27 530 MW (by 2025) as anticipated by the IRP (including 1 020 MW from Peakers, 4 800 MW from Nuclear, 7 100 MW from Wind, 1 100 MW from CSP, 125 MW from Landfill, small hydro and biomass, 2 750 MW from coal, 711 MW from gas CCGT, 2 415 MW from diesel OCGT, 2 609 MW from imported hydro and 4 900 MW from solar PV) and an additional 1 800 MW cogeneration not specified per se in the IRP (of which 1 800 MW were determined by the Minister 18 August 2015). Note 4. Determinations include 14 725 MW for renewable energy and 15 390 MW for non-renewable energy to be procured from IPPs.
Salient features of the March 2019 Quarterly Report

The quarterly progress overview covers the full scope of the REIPPPP Office activities. However, due to the advanced implementation status of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) relative to other energy source-based programmes, it is largely focused on the REIPPPP.

The report comprises two sections and one appendix, namely:

- IPPPPP context and highlights - A standard introduction to and overview of the programme context with respect to building supply capacity, as well as programme highlights to date.
- The REIPPPP contribution - This section highlights the programme's associated contribution to the national development objectives and reports specifically on the REIPPPP status, statistics, analyses and projections.
- Appendix A - The appendix contains reference notes, definitions and terminology

Quarter highlights

In the Large REIPPPP, 90 of the 92 projects have reached Financial Close. The last BW4 project reached Financial Close on 15 December. The remaining BW3.5 project is scheduled to reach Financial Close by end July 2019, while financial close for the BW3 project still needs to be determined. Scheduled commercial operations for these projects will commence from late 2019 to 2022.

The Smalls programme and future bid windows are currently on hold pending the release of the new IRP.

By the end of March 2019, the REIPPPP had made the following significant impacts.

Energy supply capacity impact:

- 6 422 MW\(^1\) of electricity had been procured from 112 RE Independent Power Producers (IPPs) in seven bid rounds\(^2\);
- 3 976 MW of electricity generation capacity from 64 IPP projects\(^3\) has been connected to the national grid;
- 35 669 GWh\(^4\) of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational. Renewable energy IPPs have proved to be very reliable. Of the 64 projects that have reached COD, 62 projects have been operational for longer than a year. The energy generated over the past 12 month period for these 62 projects is 10 648 GWh\(^5\), which is 96% of their annual energy contribution projections (P50)\(^6\) of 11 146 GWh over a 12 month delivery period. Twenty eight (28) of the 62 projects (45%) have individually exceeded their P50 projections.

Investment, economic, social and environmental impacts:

- Investment (equity and debt) to the value of R209.7 billion\(^7\), of which R41.8 billion (20%) is foreign investment, was attracted;
- Created 40 134 job years\(^4\) for South African citizens to date;
- Socio-economic development contributions of R860.1 million to date, of which R81.1 million was spent in this reporting quarter;
- Enterprise development contributions of R276.7 million to date, of which R26.5 million was spent in this reporting quarter;
- Carbon emission reductions\(^8\) of 36.2 Mton CO\(_2\)\(^7\) has been realised by the programme from inception to date, of which 2.91 Mton in this reporting quarter;
- Water savings\(^9\) of 42.8 million kilolitres has been realised by the programme from inception until the end of March 2019, of which 3.4 million kilolitres in this reporting quarter.

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**Note 1.** 6 422 MW from 92 large scale RE + 99 MW from 20 small scale RE IPPs. **Note 2.** Bid windows 1, 2, 3, 3.5, 4 and smalls BW1 (152) & smalls BW2 (252). **Note 3.** Projected annual energy contribution - refer to explanatory notes at end of this report for the definition. **Note 4.** The equivalent of a full time employment opportunity for one person for one year. **Note 5.** Carbon emission reduction is calculated based on a displacement of power, from largely coal-based to more environmentally friendly electrical energy generation, using a gross Eskom equivalent emissions factor of 1.015 tons CO\(_2\)/MWh. **Note 6.** Energy figure understated. Latest quarterly figures not received from some IPPs. To be corrected next reporting period. **Note 7.** Carbon emission reductions figure understated as this relates directly to the energy figure. Latest quarterly energy figures were not received from some IPPs. To be corrected next reporting period. **Note 8.** There are 66 operational sites – one LG project has 3 sites, of which 3 sites are operational. **Note 9.** Based on an estimated water use factor of 0.2L/kWh compared to a water use factor of 1.4L/kWh for Eskom fleet. **Note 10.** BW4 data updated to Financial Close data.
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**Appendix A** Clarification notes, glossary of terms and icons

A
IPPPP context and highlights
Introduction

Introducing the context for the IPPPP

The National Development Plan (NDP) identifies the need for South Africa to invest in a strong network of economic infrastructure designed to support the country’s medium- and long-term economic and social objectives. Energy infrastructure is a critical component that underpins economic activity and growth across the country, and it needs to be robust and extensive enough to meet industrial, commercial and household needs.

The NDP calls for an additional 10 000 MW electricity capacity to be generated by 2019, against the 2010 baseline of 44 000 MW1.

The Integrated Resource Plan (IRP) 20102 proposed a preferred energy mix with which to meet the electricity needs over a 20 year planning horizon to 2030.

In line with the national commitment to transition to a low carbon economy, 17 800 MW of the 2030 IRP target are expected to be from renewable energy sources, with 5 000 MW to be operational by 2019 and a further 2 000 MW (i.e. combined 7 000 MW) operational by 2020.

Planning requirements3 further include capacity to supply for base load and medium term risk mitigation (MTRM) plans.

In May 2011, the DoE gazetted the Electricity Regulations on New Generation Capacity (New Generation Regulations) under the Electricity Regulation Act (ERA).

The ERA and New Generation Regulations enable the Minister of Energy (in consultation with NERSA) to determine what new capacity is required. Ministerial determinations give effect to components of the planning framework of the IRP, as they become relevant.

New capacity determinations include:

- **14 725 MW** of renewable energy (comprising of solar PV: 6 225 MW, wind: 6 360 MW, CSP: 1 200 MW, small hydro: 195 MW, landfill gas: 25 MW, biomass: 210 MW, biogas: 110 MW and the small scale renewable energy programme: 400 MW);
- **6 250 MW** designated from coal-fired plants (including 3 750 MW from cross-border projects);
- **1 800 MW** of cogeneration;
- **3 726 MW** of gas-fired power plants; and
- **2 609 MW** of imported hydro.

Opening the market for IPPPs

A significant share of the new electricity capacity will be developed and produced by Independent Power Producers (IPPs).

The introduction of private sector generation offers multiple benefits. It is contributing greatly to the diversification of both the supply of energy and nature of its production, assisting in the introduction of new skills and in new investment into the industry, and enabling the benchmarking of performance and pricing.

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**Note 1.** Eskom’s electricity output from its generation infrastructure (coal, gas, hydro, pumped storage, nuclear and wind).  
**Note 2.** Electricity Regulations on the Integrated Resource Plan 2010-2030, under the Electricity Regulation Act, 2006 (Act No. 4 of 2006) as promulgated and gazetted on 6 May 2011. The IRP 2018 will provide new procurement targets for the IPPPP once promulgated and gazetted.  
**Note 3.** Given effect by various Ministerial Determinations.
The New Generation Regulations establish rules and guidelines that are applicable to the undertaking of an IPP Bid Programme and the procurement of IPPs for new generation capacity. These guidelines include:

- compliance with the IRP 2010;
- the acceptance of a standardised power purchase agreement (PPA);
- a preference for a plant location that contributes to grid stabilisation and mitigates against transmission losses; and
- a preference for a plant technology and location that contributes to local economic development.

The Independent Power Producers Procurement Programme (IPPPP) Office and mandate

The Department of Energy (DoE), National Treasury (NT) and the Development Bank of Southern Africa (DBSA) established the IPPPPP Office for the specific purpose of delivering on the IPP procurement programme objectives.

In November 2010 the DoE and NT entered into a Memorandum of Agreement (MoA) with the DBSA to provide the necessary support to implement the IPPPPP and establish the IPPPPP Office. A new MoA was agreed by all parties in May 2016 for an additional 3-year period, and then again in April 2019 for another year. A further MOA extension will be dependent on progress with the institutionalisation of the IPPO.

The programme’s primary mandate is to secure electrical energy from the private sector for renewable and non-renewable energy sources. With regard to renewables, the programme is designed to reduce the country’s reliance on fossil fuels, stimulate an indigenous renewable energy industry and contribute to socio-economic development and environmentally sustainable growth.

The IPPPPP has been designed not only to procure energy, but has also been structured to contribute to the broader national development objectives of job creation, social upliftment and broadening of economic ownership.

The scale and scope of electricity infrastructure development under the IPPPPP extend beyond the national footprint to the establishment of broader regional linkages and partnerships. Active engagement and collaboration interfaces have been developed with, amongst others, the South African Development Community (SADC), African Union (AU) and South African Power Pool (SAPP). Bilateral linkages are also being pursued in support of cross-border project collaboration and capacity support, knowledge sharing and skills enhancement.

The programme is contributing to the security of energy supply and ensuring a diversified energy mix through the procurement of significant additional renewable energy, coal, gas and cogeneration capacity from the private sector, in accordance with the capacity allocated to renewable energy and non-renewable generation in the Integrated Resource Plan (IRP) 2010; subsequent ministerial determinations and DoE support service requirements.

The IPPPPP Office provides the following services:

- Professional advisory services;
- Procurement management services;
- Monitoring, evaluation and contract management services (as from 7 July 2014) – with contract periods up to 30 years.

### Renewable Energy Procurement

1. REIPPP Programme
   - (onshore wind, solar PV, CSP, small hydro, biomass, biogas, landfill gas)
2. Small REIPPs
3. Hydro
4. Cogeneration (from agricultural waste / byproducts)

### Advisory services

- Gas Policy Framework
- Energy Solutions for the future
- Grid Development and Grid Code Enhancement
- Solar Water Heaters Repair and Replace
- Regulatory and legislative aspects impacting on the IPPPPP
- Regional co-operation
The IPPPPP has been commended\(^1\) for effectively avoiding the quicksand of laborious administrative arrangements, without undermining the quality or transparency of the programme.

The IPPPPP partnership is funded by a Project Development Facility (PDF) financed through bid registration fees payable by all bidders and the Development Fee paid by selected bidders.

An evolving scope of services

The IPPPPP Office has three interrelated focus areas:

- It is a key procurement vehicle for delivering on the **national renewable energy capacity building** objectives;
- It is responsible for securing electricity capacity from IPPs for **non-renewable energy sources** as determined by the Minister of Energy; and
- **It is providing advisory services**, related to programme / project planning, development, delivering and financing focused on creating an enabling and stable market environment for IPPs.

The IPPPPP activities continue to evolve in order to effectively respond to the planning and development needs in the current energy context, e.g. investigating the feasibility of future energy solutions such as energy storage.

Energy triangle\(^2\)

Increasingly, a sound, comprehensive energy strategy is structured as a triangle with the three sides denoting, respectively: promoting economic development, providing energy security and access while achieving environmental sustainability.

South Africa’s current electricity development strategy aims to achieve a greater balance between these three aspects, focusing on achieving a balanced energy mix to include more gas and renewables.

An appropriate approach to development of a sustainable energy portfolio has to take account of how new development and capacity delivers against the imperatives of the energy triangle.

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Alignment with the National Development Plan (NDP)

Infrastructure investment is a key priority of the National Development Plan (NDP). The NDP identifies the need for South Africa to invest in a strong network of economic infrastructure, designed to support the country’s medium- and long-term economic and social objectives.

This chosen procurement approach has further enabled the programme to effectively target and contribute to several of the national outcomes as defined in the NDP. Across the 14 stated national outcomes (refer to table on the right) the IPP programme contributes directly and indirectly to 10 of these. The most significant contribution is however towards Outcome 6: An efficient, competitive and responsive economic infrastructure network.

In terms of electricity infrastructure planning, the NDP translated the IRP 2010 long-term planning framework into prioritised, intermediate milestones, as captured in the Medium Term Strategic Framework (MTSF). The key target for electricity infrastructure development is to increase the electricity generation reserve margin from 1% (2014) to 19% in 2019 to ensure the continued, uninterrupted supply of electricity in the country. The corresponding MTSF interim delivery targets for Outcome 6 therefore require the development of 10 000 MW additional electricity capacity to be commissioned by 2019 against the 2010 baseline of 44 000 MW.

The NDP further specifies that of this target, 5 000 MW should be from renewable energy sources, with an additional 2 000 MW procured (to become operational within the following year) during the same timeframe.

Outcome 6, as it relates to electricity infrastructure that supports efficient, competitive and responsive economic development, is the principal NDP-defined outcome relevant to the DoE. The procurement and support services of the IPPPPP Office, as IPP Procurement Office for the DoE, will therefore contribute directly and primarily towards this Outcome.

The REIPPPP gives effect to these objectives through the procurement of IPPs for new generation capacity, in accordance with determinations by the Minister of Energy.


Outcome 6 | Impact indicators

<table>
<thead>
<tr>
<th>Impact indicator</th>
<th>Baseline (2010)</th>
<th>2019 target</th>
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</thead>
<tbody>
<tr>
<td>1 Adequate electricity generation capacity commissioned</td>
<td>44 000 MW (Eskom)</td>
<td>10 000 MW (added)</td>
</tr>
<tr>
<td>2 Electricity generation reserve margin increased</td>
<td>1%</td>
<td>19%</td>
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</table>

Relevant sub outcomes

- Sub-Outcome 2: Reliable generation, transmission and distribution of energy: Electricity, liquid fuels, coal and gas
- Sub-Outcome 3: Coordination, planning, integration and monitoring implementation of SIPS

Strategic Infrastructure Projects (SIPs) are vehicles created for implementation and coordination, planning, integration and monitoring of the infrastructure development targets (sub-outcome 3).

The REIPPPP constitutes a key element of the Strategic Infrastructure Programme (SIP) 8: Green energy in support of the South African economy.
Apart from contributing to outcome 6, key to the design of the IPPPP is supporting the DoE’s commitment to contribute to the achievement of outcomes 2, 4, 7, 8 and 10 and so stimulate a virtuous cycle of development growth associated with the renewable and non-renewable energy programmes.

In order to leverage the IPPPP for purposes of economic and socio-economic development, an exemption from the Preferential Procurement Policy Framework Act, 2000 (PPPFA) and the 2011 regulations under the Act, was secured for the IPPPP to set minimum achievement targets not ordinarily set in terms of other legislation and policy instruments and to induce competitiveness in offering higher target commitments.

The exemption was granted by the Minister of Finance on 22 July 2011 “on the understanding that the DoE is aiming to maximise opportunity to still achieve certain economic development objectives” that include the following:

- **Job creation**, with the emphasis on jobs for South African citizens, South African citizens who are black people and South African citizens from local communities;

- **Local content**, with the view that a certain percentage of the project value would be spent in South Africa;

- **Ownership**, with the aims to advance ownership by black people and local communities;

- **Management Control**, with the aim to achieve the involvement of black people in management positions and responsibilities;

- **Preferential Procurement**, with focus on sub-contracting to empowered enterprises, black enterprises and enterprises owned by women;

- **Enterprise Development**, with the aim of development of emerging enterprises, and those emerging enterprises located in local communities; and

- **Socio-economic Development**, which attempts to address the socio-economic needs of local communities.

At a provincial and project level the REIPPPP also contributes to Outcomes 2 and 9 where IPP community development projects are relevant, as follows:

**Outcome 2** – Improved health facility planning and infrastructure delivery.

Socio economic commitments under the REIPPPP include contributions to health care and education. Activities include building, upgrading and improvement of facilities for schools, hospitals and clinics, amongst others.

**Outcome 9** – Members of society have sustainable and reliable access to basic services.

A contribution towards this outcome is made through community projects that include infrastructure development such as development of roads or electrification of local communities.

How the outcomes relate to, or have been aligned with the bid obligations, and how the alignment has been refined in subsequent bid windows (where relevant), is illustrated on the next page.
### Outcomes | Relevant focus

#### Outcome 4 - Decent employment through inclusive economic growth
- Productive investment through infrastructure investment programme,
- Employment opportunities in the infrastructure build programme,
- Economic opportunities for historically excluded and vulnerable groups,
- Number of small businesses,
- Number of adults working in rural areas.

#### Outcome 5 – A skilled and capable workforce to support inclusive growth.

#### Outcome 7 – Vibrant, equitable sustainable rural communities contributing towards food security for all
- Reduction of rural unemployment rate,
- Increased access to quality infrastructure and services specifically education, healthcare and public transport.

#### Outcome 8 – Sustainable human settlements and improved quality of household life.

#### Outcome 10 – Protect and enhance our environmental assets and natural resources
- Reduced total emissions of CO$_2$ by 34% reduction from business as usual scenario.

#### Outcome 11 – Create a better South Africa, contribute to a better and safer Africa in a better world
- Increased FDI: R230 billion by 2019 (from baseline of R40 billion in 2013).

#### Outcome 14 – Nation building and social cohesion
- Disability and gender equality,
- Equal opportunities and redress inequality.

### Bid category

- **Job creation**
- **Enterprise development**
- **Ownership**
- **Preferential procurement**
- **Local content**
- **Job creation**
- **Management control**
- **Job creation**
- **Socio-economic development**
- **Ownership**
- **Enterprise development**
- **Socio-economic development**
- **Resulting from power generation from 'clean' energy sources (a consequence of Outcome 6)**
- **Ownership**
- **Preferential procurement**
- **Job creation**
- **Ownership**
### Alignment of thresholds and targets across bid windows

| Bid obligation category | BW1 Min | BW1 Target | BW2 Min | BW2 Target | BW3, 3.5 & 4 Min | BW3, 3.5 & 4 Target | BW1S2 & 2S2 Min | BW1S2 & 2S2 Target |
|-------------------------|---------|------------|---------|------------|------------------|---------------------|                   |                   |
| Job creation            |         |            |         |            |                  |                     |                    |                   |
| SA citizens             | 50%     | 80%        | 50%     | 80%        | 50%              | 80%                 | -                  | 90%               |
| SA citizens who are black| 30%     | 50%        | 30%     | 50%        | 30%              | 50%                 | -                  | 60%               |
| Skilled black SA citizens | 18%    | 30%        | 18%     | 30%        | 18%              | 30%                 | -                  | 50%               |
| SA citizens from local communities | 12% | 20% | 12% | 20% | 12% | 20% | - | 30% |

#### Local content

<table>
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<tr>
<th>Min</th>
<th>Target</th>
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**Key learnings incorporated**

Introduction of a local industrialization approach to stimulate green industry development – goods and services – throughout the value chain.

#### Ownership

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<tr>
<th>Min</th>
<th>Target</th>
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<td>-</td>
<td>30%</td>
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Where BW | bid window. **Note 1.** Thresholds and targets for small RE projects are not technology specific.
## Alignment of thresholds and targets across bid windows

<table>
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<tr>
<th>Bid obligation category</th>
<th>BW1</th>
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<th>BW3, 3.5 &amp; 4</th>
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<tr>
<td></td>
<td>Min</td>
<td>Target</td>
<td>Min</td>
<td>Target</td>
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<tr>
<td>Management control</td>
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<tr>
<td>Black top management</td>
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<td>40%</td>
<td>-</td>
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### Preferential procurement

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<th>BW3, 3.5 &amp; 4</th>
<th>BW1S2 &amp; 2S2</th>
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<tbody>
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<td>B8BEE Procurement spend</td>
<td>-</td>
<td>60%</td>
<td>-</td>
<td>60%</td>
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<tr>
<td>SME and QME (QSE and EME) Procurement</td>
<td>-</td>
<td>10%</td>
<td>-</td>
<td>10%</td>
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<tr>
<td>Women owned vendor procurement</td>
<td>-</td>
<td>5%</td>
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### Enterprise development

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<thead>
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<th>BW1</th>
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<th>BW3, 3.5 &amp; 4</th>
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<td>Enterprise development contributions</td>
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<tr>
<td>Adjusted enterprise development contributions</td>
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### Socio-economic development

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<th>BW1</th>
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<th>BW3, 3.5 &amp; 4</th>
<th>BW1S2 &amp; 2S2</th>
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<td>Adjusted socio-economic development contributions</td>
<td>1.0%</td>
<td>1.5%</td>
<td>1.0%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

Where BW | bid window.  
**Note 1.** Small RE projects have additional SME participation obligations (minimum of 30%; target of 60%).  
**Note 2.** Small RE projects have additional enterprise development obligation towards SMEs (minimum of 0.5%; target of 1%).
Alignment with Strategic Infrastructure Projects (SIPs)

Government adopted a framework consisting of 18 Strategic Infrastructure Projects that is intended to transform the economic landscape of South Africa, create a significant number of new jobs, strengthen the delivery of basic services to the people of South Africa and support the integration of African economies.

- In order to address these challenges and goals, Cabinet established the Presidential Infrastructure Coordinating Committee (PICC) to:
  - coordinate, integrate and accelerate implementation;
  - develop a single common National Infrastructure Plan that will be monitored and centrally driven;
  - identify who is responsible and hold them to account; and
  - develop a 20 year planning framework beyond one administration to avoid a stop-start pattern to the infrastructure roll-out.

Under their guidance, 18 strategic integrated projects (SIPs) have been developed. The SIPs can be grouped into the following broad areas:

- Five geographically-focused SIPs;
- Three energy SIPs;
- Three spatial SIPs;
- Three social infrastructure SIPs;
- Two knowledge, one regional integration and one water and sanitation SIP.

In this context, through engagement with the PICC secretariat, the relevant SIPs for the IPPPP have been identified, to leverage synergy around economic and socio economic development. The associated reporting requirements for the IPPPP have also been specified for alignment and integration purposes (refer subsequent table).

The Green Energy Strategic Infrastructure Programme (SIP 8), that operationalises NDP Outcome 6, reinforces the RE infrastructure imperative with a target to deliver 6 725 MW RE through IPPs by 31 March 2019 (not including 200 MW by small scale RE projects). This target was not met due to delays in concluding PPAs of BW3.5 and BW4 projects with Eskom, between the time of procurement and April 2018, as well as delays in the finalisation of the IRP 2018.
<table>
<thead>
<tr>
<th>Item</th>
<th>Strategic Infrastructure Project</th>
<th>Engage</th>
<th>Report + alignment</th>
</tr>
</thead>
</table>
| 4    | SIP 8: Green energy in support of the South African economy  
Co-ordinating institution: IDC (Industrial Development Corporation)  
Description: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP2010).  
Support bio-fuel production facilities. | X | X |
| 5    | SIP 9: Electricity generation to support socio-economic development  
Co-ordinating institution: Eskom  
Description: Accelerate the construction of new electricity generation capacity in accordance with the IRP2010 to meet the needs of the economy and address historical imbalances.  
Monitor implementation of major projects such as new power stations: Medupi, Kusile and Ingula. | X | X |
| 6    | SIP 10: Electricity transmission and distribution for all  
Co-ordinating institution: Eskom  
Description: Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development.  
Align the 10 year transmission plan, the services backlog, the national broadband rollout and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity. | X | X |
| 7    | SIP 16: SKA & Meerkat  
Co-ordinating institution: SKA (Square Kilometre Array)  
Description: SKA is a global mega-science project, building an advanced radio-telescope facility linked to research infrastructure and high-speed ICT capacity and provides an opportunity for Africa and South Africa to contribute towards global advanced science projects. | X |
| 8    | SIP 17: Regional integration for African cooperation and development  
Co-ordinating institution: To be determined  
Description: Participate in mutually beneficial infrastructure projects to unlock long-term socio-economic benefits by partnering with fast-growing African economies with projected growth ranging between 3% and 10%. | X |
| 9    | SIP 18: Water and sanitation infrastructure  
Co-ordinating institution: TCTA (Trans-Caledon Tunnel Authority)  
Description: A 10-year plan to address the estimated backlog of adequate water to supply 1.4 m households and 2.1 m households to basic sanitation. The project will involve provision of sustainable supply of water to meet social needs and support economic growth. | X |

The DoE is conducting the monitoring and progress with regard to the implementation of the IPP projects through its IPPPP Office. The DoE retains the responsibility to report on programme achievements of SIP 1, SIP 8 and SIP 9 to the PICC structures.

With respect to SIP1 and SIP 9, that is coordinated by Eskom, the IPPPP Office, in providing a monitoring function, will collate and supply status information on the two coal projects in Bid Window 1, once the projects commence construction.
IPPPP Overview

Giving effect to the IRP 2010 diversified energy mix, delivery on NDP Outcome 6 targets and IPP build mandate

- REIPPPP
- Small REIPPPPs
- Cross border
- Coal (base load)
- Cogeneration
- Gas
- REIPPPP (onshore wind, solar PV, CSP, small hydro, biomass, biogas, landfill gas)
- Small REIPPPPs
- Cross border (hydro, coal, gas, etc.)
- Contract management only
- Monitoring of IPPs and DoE Peaking Plants

**Procurement and Contract management focus**
- Coal (base load)
- Cogeneration
- Gas
- REIPPPP (onshore wind, solar PV, CSP, small hydro, biomass, biogas, landfill gas)
- Small REIPPPPs
- Cross border (hydro, coal, gas, etc.)
- Contract management only
- Monitoring of IPPs and DoE Peaking Plants

**Advisory**

Planning and strategy development inputs in support of DoE and / or IPPPP future procurement objective:
- Gas Policy Framework
- Energy Solutions for the future including energy storage, energy impact analysis, energy financing
- Grid Development and Grid Code Enhancement
- Solar Water Heaters Repair and Replace
- Regulatory and legislative aspects impacting on the IPPPP
- Regional Co-operation

**Procurement and Contract management focus**
- Coal (base load)
- Cogeneration
- Gas
- REIPPPP (onshore wind, solar PV, CSP, small hydro, biomass, biogas, landfill gas)
- Small REIPPPPs
- Cross border (hydro, coal, gas, etc.)
- Contract management only
- Monitoring of IPPs and DoE Peaking Plants

**Energy share 2030** takes into consideration decommissioned coal units (10.9 GW) and previously committed Wind and CSP (i.e. 1.0 GW over and above 17.8 GW IPP target).

REIPPPP highlights

Successfully delivering clean energy timeously and cost effectively

megawatts operational (MW)

<table>
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<tr>
<th>Planned: 4001 MW</th>
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portfolio price trend (R/kWh)

Note: REIPPPP prices expressed in April 2018 terms

- BW 1: 2.79
- BW 2: 1.83
- BW 3: 1.47
- BW 4: 0.92

(1) BW1
(2) BW2
(3) BW3
(4) BW4

Clean energy generated (GWh)

- 2015/16: 10.766 GWh
- 2016/17: 35.669 GWh
- 2017/18: 32.531 GWh
- 2018/19: 37.499 GWh

...and is supporting broader development objectives

Total foreign investment attracted of total investment (cumulative R209.7 billion)

- Debt
- Equity

<table>
<thead>
<tr>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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</thead>
<tbody>
<tr>
<td>35</td>
<td>18</td>
<td>48</td>
<td>52</td>
</tr>
</tbody>
</table>

The total foreign equity and financing invested in REIPPs (BW1 - BW4, IS2 & 2S2) reached R41.8 billion by March 2019.

Employment creation (job years)

- Total: 17 785
- SA Citizens: 15 948
  - From local communities: 8 904
  - From other: 7 044
- Other: 2 837

RE generation plants are capital and intensive and technologically advanced.

40 134 direct Job Years (45 543 FTEs) created for South African citizens by March 2019, including people from communities local to the IPP operations. Of these jobs 33 019 (82%) were created during construction and 7 115 (18%) in the operational phase of the projects. 44 590 Total job years (50 600 FTEs) created in total by the programme to date of which 43% is for the youth.

Equitable shareholding (%)

- SA Citizens from local communities: 33%
- SA Citizens from other: 42%
- Other: 25%

The IPPPP: (i) Empowered South Africans, who own on average 52% equity in all IPPs; (ii) Broadened Black Economic Empowerment, as Black South Africans own, on average, 33% of project equity (shareholding) in the projects which have reached financial close [i.e. projects in BW1 – BW4]; and (iii) Secured 9% equity in IPPs for local communities, who will receive R26.9 billion net income over the life of the projects [20 years].

Note 1. 64 projects have reached commercial operation date (COD) out of 64 that were planned by March 2019. One of the projects has 5 [anafl] gas sites, of which only 3 have reached COD. Therefore, 66 sites have reached commercial operation date (COD) out of 68 that were planned by March 2019.

Note 2. Contracted price (at which power is sold to Eskom) per IPP was weighted with consideration of the technologies and that relative, projected annual energy contribution (PAC) (in April 2018 terms), BW3 estimated rate incorporates the peak tariff [270% of base rate] applicable to CSP. BW3.5 is not included as it is technology specific.

Note 3. For actual achievements only data for projects that have completed financial close is reported – BW1, BW2, 16 of 17 BW3 projects, 1 of 2 BW3.5 projects and BW4 projects. Projects which have not completed financial close – 1 BW3 project, 1 BW3.5 project, BW12 & BW22.

Note 4. Carbon emission reductions reflect all energy generated inception to date.

Note 5. Employment / Job creation measured in job years (equivalent of a full time employment opportunity for one person for one year).

Note 6. Energy (and carbon emissions) figures understated. Latest quarterly figures not received from some IPPs. To be corrected next reporting period.

Note 7. BW4 data updated to Financial Closing Q4_2018.
The REIPPPP contribution:

Energy supply capacity impact

NDP, Outcome 6
The procured portfolio of RE capacity

Delivery on Outcome 6 targets and the REIPPPP procurement mandate

The REIPPPP has successfully procured 6.4 GW from 112 IPPs in BW1 to BW4, IS2 and 2S2. Of this, 6.2 GW (from BW1, BW2, BW3, BW3.5 and BW4) are at various stages of construction or have commenced with commercial operation.

By end March 2019, 4 001 MW of the procured capacity started operations and delivered 3 976 MW of actual capacity (i.e. 64 IPPs delivering 25 MW short of procured capacity). In terms of national targets for renewable energy capacity, as defined by the IRP and National Development Plan, this represents 22% towards the 2030 target and 57% towards the 2020 target (i.e. 7 GW RE capacity to be procured by 2019 and commissioned by 2020 and 17.8 GW by 2030). 0.6 GW is still to be procured to meet the 2019 procurement target.

Achieving the desired energy mix

The energy mix of the procured REIPPPP portfolio is well aligned with the IRP planned mix as targeted for 2030.

The relative share from both CSP and wind is higher than originally planned, with the solar PV share 12% lower in the current mix. The slight divergence from the IRP 2010 is informed by technology, price and system requirements and follows from the four ministerial determinations in 2010, 2011, 2015 and 2016.
In four separate ministerial determinations (2011, 2012, 2015 and 2016), the Minister of Energy determined that 14 725 MW power from renewable energy be procured, drawing from the following technologies:
- onshore wind;
- solar photovoltaic;
- concentrated solar power (CSP);
- biogas;
- biomass;
- landfill gas; and
- small hydro.

The determinations provide for the capacity contributions from the respective technologies towards the total 14 725 MW, as shown in the figure to the left.

The determinations have been implemented in rolling bid windows with seven (1, 2, 3, 3.5, 4, 1S2 and 2S2) bid windows successfully completed. The number of projects, capacity contribution and technology share resulting from the procurement process towards the overall target are illustrated on the left.

In terms of progress, this represents 44% of the already determined capacity (14 725 MW).

Cost effectiveness of the REIPPPP (Actual bid prices)

In line with international experience, the price of renewable energy is increasingly cost competitive when compared with conventional power sources. The REIPPPP has effectively captured this global downward trend with prices decreasing in every bid window.

Energy procured by the REIPPPP is progressively more cost effective and rapidly approaching a point where the wholesale pricing for new coal- and renewable-generated energy intersect.

Eskom published LCOEs for Medupi and Kusile in 2012 quoted R0.54 and R0.73/kWh respectively (R0.74 and R1.01/kWh in April 2018 terms). Cost over-runs, increases in financing and (expected) increases in operational (including coal) costs prompted industry to challenge the validity of Eskom’s cost projections. Industry counter estimates at the time for the LCOE of Medupi were R0.97/kWh (R1.34 in April 2018 terms). Considering the ongoing delays in completion, indications are that these costs may even be significantly higher.
### Average technology tariffs

#### R/kWh

<table>
<thead>
<tr>
<th>Average</th>
<th>Per bid window</th>
<th>N8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.08</td>
<td>-50% 1.67 1.31 0.96 0.84</td>
<td></td>
</tr>
<tr>
<td>2.82</td>
<td>-7% 3.93 3.68 2.14 1.99</td>
<td></td>
</tr>
<tr>
<td>2.05</td>
<td>-75% 4.04 2.41 1.29 1.01</td>
<td></td>
</tr>
<tr>
<td>1.48</td>
<td>-8% 1.51 1.38</td>
<td></td>
</tr>
<tr>
<td>1.23</td>
<td>-2% 1.83 1.80</td>
<td></td>
</tr>
<tr>
<td>1.80</td>
<td>1.23</td>
<td></td>
</tr>
</tbody>
</table>

#### R/kWh for small RE projects

<table>
<thead>
<tr>
<th>Per technology</th>
<th>1.54</th>
<th>1.27</th>
<th>1.35</th>
<th>1.83</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.12</td>
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In comparison, the estimated, average portfolio cost for all technologies under the REIPPPP has dropped consistently in every bid period to a combined average of R0.92/kWh in BW4.

**Cost effectiveness of RE technologies**

Pricing and trends vary across the respective technologies, but have shown a similar downward trend.

The price for wind power has dropped by 50% to R0.84/kWh, with the BW4 price directly comparable with the per kWh price of new coal generation.

Solar PV has dropped most significantly with a price decrease of 75% to R1.01/kWh between BW1 and BW4.

CSP rates in BW3 and BW3.5 were differentiated with a base and peaking rate component and are therefore indicated separately in the diagram to the left. The average rate of CSP decreased by 7% to R3.68/kWh between BW1 and BW2 and by 8% to R1.99/kWh from BW3 to BW3.5 (average base rate).

The average rate per technology type for the small projects are shown to the left. The first small scale renewable energy bid window has been procured at an average price of R1.54/kWh (in April 2018 terms). As anticipated, the cost of small scale projects are higher than that of large projects. The rates achieved for all three technologies in this first procurement round are comparable to the corresponding large scale rates achieved in BW3 (bid announcement for BW3 was made in October 2013, 2 years prior to 1S2). More recently the second small scale renewable bid window has been procured at an average price of R1.12/kWh for solar PV projects. As anticipated, this is significantly lower than the first small bid window, and a similar downward price trend, as with the large projects, has been realised.

Prices contracted under the REIPPPP for all technologies are well below the published REFIT prices. The REIPPPP has effectively translated policy and planning into delivery of clean energy at very competitive prices. As such it is contributing to the national aspirations of secure, affordable energy, lower carbon intensity and a transformed “green” economy.

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**Note 1.** Contracted price (at which power is sold to Eskom) per IPP was weighted with consideration of the technologies and their relative, projected annual energy contribution (P50). **Note 2.** Without considering the technical differences in availability and load factors. **Note 3.** Fully indexed price, inflation adjusted (2018). **Note 4.** The peaking rate is 270% of the base rate (i.e. an average of R5.31/kWh for BW3 and 3.5).
Technology contributions

The mix of renewable energy has varied very little between bid windows. Solar PV and wind have dominated the first two bid windows. Later bid windows have however shown some diversity. Small hydro technology was procured only in BW2 and BW4, biomass was procured in BW3, BW4 and 1S2, while landfill gas was procured in BW3 only. CSP has been procured across 4 of the 7 bid windows while only solar PV was procured in 2S2.

The third determination, promulgated on 18 August 2015, increased the allocation to be procured from RE by 6 300 MW. This was increased further by a fourth determination, promulgated on 27 May 2016, that allocated an additional 1 500 MW to be procured, specifically from solar PV. The additional determinations served to provide bidders and investors with a line of sight on future prospects, which was regarded as important for maintaining the momentum of the programme.

Progress in terms of the revised targeted capacity from the respective technologies, as per the ministerial determinations, has been made, as shown on the left.

To date, 44% (i.e. 6 422 MW) of the total targeted RE capacity of 14 725 MW (including 400 MW for Small projects) has been procured. More than half of the wind power has been procured to date (3 357 MW or 53% of the 6 360 MW determined capacity for wind). For CSP 50% or 600 MW of the determined capacity of 1 200 MW has been procured. Power procured from solar PV has reached 37% or 2 292 MW of the 6 225 MW determined, while only 14% of the 540 MW allocated to small hydro, landfill gas, biomass have been procured to date.

For small scale renewable energy projects 400 MW have been determined and 49 MW has been procured under 1S2 and a further 50 MW under 2S2. This combined 99 MW represents 25% of the allocated capacity for Small projects. The 99 MW include 80 MW from solar PV, 9 MW from wind power and 10 MW from biomass.
Geographic distribution

IPP project distribution has automatically aligned with the prevalence of renewable energy resources. Solar has contributed the largest number of IPPs with PV and CSP IPPs making up 68 of the 112 projects. Solar projects are concentrated in the Northern Cape where the radiation intensity in the country is the highest. As a result, the Northern Cape has received the bulk of the projects (59 of 112 in BW1, BW2, BW3, BW3.5, BW4, 1S2 and 2S2) and should see the benefit from the significant associated investments and the socio-economic commitments that have been secured for local communities through the procurement process.

Wind projects are largely located along the coastal regions of the Eastern Cape and Western Cape provinces based on the strong wind flows along these shores. After the Northern Cape, the Eastern and Western Cape share the largest number of the remaining IPPs (17 and 14 projects, respectively). The remainder of the IPP projects are distributed as follows:

- **Free State**: 9 projects
- **North West**: 6
- **Limpopo**: 3
- **Mpumalanga**: 2
- **Gauteng and KwaZulu Natal**: 1 each

BW3 included the first landfill gas and the first biomass IPPs, as well as the first projects in both Gauteng and KwaZulu Natal. Mpumalanga’s first project was awarded in BW4.

Generation from landfill gas and biomass power plants are less constrained by energy availability and typically offers higher load factors. Higher load factors, availability during peak demand hours, increasing energy diversity and a larger distribution footprint of generation capacity offered by these technologies, further contribute to the value of the renewable energy portfolio.
Technology distribution

The geographical distribution of projects is largely based on favourable resource conditions, in particular solar radiation and wind flows throughout the year, as illustrated below.

Solar maps for South Africa, Lesotho and Swaziland, GeoModel Solar

Wind Atlas of South Africa (WASA), Large Scale High Resolution Wind Resource map, April 2014

Solar maps for South Africa, Lesotho and Swaziland, GeoModel Solar

Note 1. Developed in partnership between Centre for Renewable and Sustainable Energy Studies, University of Stellenbosch and Group for Solar Energy Thermodynamics (GSET) at UKZN (2014), www.sauran.net.
Building capacity to power the country

REIPPPP portfolio status – a snapshot (as at 31 March 2019)

The status of the combined portfolio of the 112 IPP projects procured in BW1 - BW4, 1S2\(^1\) and 2S2\(^1\) is:
- There are 90 active\(^2\) projects of which 64 projects are in operation and have added 3 976 MW generation capacity to the national grid. Since the first plant became operational 35 669 GWh\(^3\) of renewable energy has been generated.
- All 28 projects in BW1 and 19 projects in BW2 have reached COD.
- Of the 17 projects from BW3, 16 have reached COD and have a total generation capacity of 1 428 MW. The remaining project is still awaiting financial close.
- Of the 2 projects in BW3.5, 1 is in operation while 1 is still awaiting financial close\(^5\).
- All 26 projects in BW4 are in construction.
- The Small projects - BW1 (1S2) (10 projects) and BW2 (2S2) (10 projects) are still awaiting financial close before they will commence with construction.

REIPPPP operational capacity

Capacity

Close correlation of actual to planned (refer close up of selected period)

Operational capacity

Of the 90 active\(^2\) projects, 64 have successfully completed construction. The average construction lead time for this current portfolio of projects has been 702 days (~1.9 years).

Based on scheduled commissioning dates and progress to date, it is projected that all active\(^2\) projects in BW1 to BW4 (90 projects) will be operational by 29 October 2021.

4 001 MW (from 68 sites) was scheduled to be operational by end of March 2019, with 3 976 MW realised (from 66 sites\(^4\)). 99% of the scheduled capacity has been achieved, with a 25 MW shortfall from the capacity scheduled by the end of this period. The landfill project\(^4\), where only 3 of its 5 sites have reached COD, is contributing 5.4 MW to the shortfall.

Note 1. 1S2 and 2S2 refers to Smalls BW1 and BW2 respectively. Note 2. Projects which have commenced construction. Note 3. Energy figure understated. Latest quarterly figures not received from some IPPs. To be corrected next reporting period. Note 4. A Landfill project with 5 sites in Gauteng has a contracted capacity of 13 MW. To date only 3 sites (7.56 MW achieved) is in operation resulting in a 5 MW shortfall. Note 5. The project has reached Commercial Close with Financial Close scheduled to take place by 31 July 2019.
For most of the preceding quarters since the first IPP started operation, actual commercial operation dates tracked the planned or scheduled dates closely (refer to extract of the tracking graph on the left).

The lag of actual to planned peaked at 350 MWs at the end of June 2014. This lag is attributed to projects completing behind schedule and/or under delivery against contracted capacity. At the end of March 2019, 64 projects (100%) out of 64 scheduled to be operational had reached COD¹. The few IPPs in operations delivering below their contracted capacity are resulting in a shortfall of 23 MW.

The average time delay between actual and scheduled COD for IPPs in operation was 64 days i.e. ~2.2 months. BW1 projects were mostly responsible for the delay followed by BW2 projects which were, on average, 89 and 79 days delayed, respectively. The average time delay between the actual and scheduled COD for the 16 BW3 projects that are operational was only 7 days. Delivery delays are partly ascribed to:

- Delays in grid connection;
- Extended industrial action in the metals and mining industries early in 2014.

There are 26 IPPs still in construction. At the end of the reporting quarter all active projects, except one BW3, were on course to reach COD on their scheduled date without delays.

- All 28 BW1 projects have reached COD, as have all 19 BW2 projects.
- There are 17 projects in BW3 of which 16 projects have reached COD. 1 project is still awaiting financial close. The latest estimated completion date for the last BW3 project is 2 October 2019.
- The one BW3.5 project that is still awaiting financial close, is expected to be completed by 15 October 2019.
- The 26 projects in BW4 that have reached financial close should be completed by 29 October 2021.

Operational capacity (3 976 MW) is contributed by Solar PV (1 474 MW), Onshore Wind (1 980 MW), CSP (500 MW), Hydro (14 MW) and Landfill (8 MW) technology.

---

¹Note 1. 64 projects (but 68 sites) were scheduled to reach COD. A Landfill project with 5 sites in Gauteng where scheduled to have 5 sites operational, but to date only 3 sites is in operation.
Average delivery lead time

1.9 years

average lead time for delivering 3976 MW operational capacity

Construction duration

As indicated previously, despite delays, the average construction lead time for the current portfolio is 702 days i.e. 3 976 MW generation capacity was delivered within 1.9 years.

Based on the construction experience of the portfolio of technologies in the first three bid windows, it is concluded that capacity (plant size) and construction duration do not have a strong correlation.

When considering the distribution of lead times, the majority of completed projects (44 of 64) took between 15 and 25 months to be constructed. The cluster of projects that were completed in the 15 – 25 month timeframe, delivered 2 325 MW, representing 58% of the 3 876 MW operational capacity. To date, no projects were completed in less than 12 months. The graph to the left shows CSP projects take longer to construct with their shortest lead time being 27 months. Otherwise, as expected, this analysis confirms that significant renewable capacity can be brought online within a short timeframe.

Energy supplied

The first IPP reached COD, supplying power to the grid, in November 2013. Since inception², 35 669 GWh³ of energy has been generated, by renewable energy sources, from the 64 projects that are operational. Of this energy, 2 864 GWh³ was generated during this reporting quarter, which is 7% less than the 3 063 GWh generated in the previous quarter³.

The energy generated over the last 12 months (April 2018 – March 2019), from limited operations by the 64 projects that have reached COD, was 10 766 GWh³.

- This 10 766 GWh³ represents 91%⁴ of the annual projected energy production by all the operational IPPs (P50¹ for the 64 operational IPPs is 11 882 GWh).
- The average operational period of the current portfolio of the 64 IPPs is 1 248 days (approximately 40.9 months).
- All the 47 BW1 and BW2 projects are in operation and have generated 6 635 GWh³ over the last 12 months. This equates to 96% of their combined annual projected energy production (P50¹) of 6 878 GWh.

Note 1. Refer to explanatory notes at end of this report for the definition. Note 2. Total renewable energy generated by the IPPs since the first project became operational. Note 3. Energy figure understated. Latest quarterly figures not received from some IPP’s. To be corrected next reporting period. Note 4. Not all plants were operational for a year and not all IPPs provided generation data this quarter, hence the figure is understated.
Of the 64 projects that have reached COD, 62 projects have been operational for longer than one year. The energy generated over the past 12 month period for these 62 projects is 10 648 GWh², which is 96% of their P50 projection of 11 146 GWh over a 12 month delivery period.

Twenty eight (28) of sixty two (62) projects (45%) have individually exceeded their P50 projections, while 77% of the projects achieved greater than 90% of P50. These are for solar PV, onshore wind, CSP and small hydro projects.

- Solar PV – The majority of operational IPPs are solar PV plants. Thirty three (33) projects, with this technology, have been operational for more than 1 year, and have generated 3 330 GWh² over the past 12 month period, which exceeds their P50 projections of 3 194 GWh by 4%. Individually, 22 of these 33 PV projects (67%) have exceeded their P50 projections, while 32 (97%) of the IPPs achieved greater than 90% of their P50 projection. Thirteen (13) projects have exceeded 110% of their target. One (1) project fall short of achieving greater than 90% of their P50 projections.

- Onshore wind – 22 projects using onshore wind technology have been operational for more than 1 year, and these IPPs have generated 6 158 GWh² over the past 12 month period, which falls short of their total P50 projections, of 6 660 GWh, by 8%. Individually, 4 of these 22 wind projects (18%) have exceeded their P50 projections, while 59% of the IPPs achieved greater than 90% of their P50 projections. Seven (7) projects fall short of achieving greater than 90% of their P50 projections.

- CSP and Small Hydro – Four (4) CSP projects that have reached COD have been in operation for more than 12 months. These projects generated 1 056 GWh² (94%) against a P50 projection of 1 126 GWh over the past 12 month period. Two (2) Small Hydro (SH) projects have reached COD, and have been operational for more than 12 months. One of the SH projects exceeded 110% of its target. It should be noted that performance of projects are dependent on the availability of the power source, e.g. in the case of the underperforming Small Hydro project, energy generation could be impacted by the drought experienced in the Northern Cape Province where the project is located.

Note 1. Refer to explanatory notes at end of this report for the definition. Note 2. Energy figure understated. Latest quarterly figures not received from some IPP’s. To be corrected next reporting period.
Of the 64 projects that have reached COD, 56 projects have been operational for longer than 24 months. When comparing the 56 projects over the two 12 month periods, the following is noted:

- For Year 1 (April 2017 – March 2018) 8 099 GWh² (96%) of the 8 480 GWh P50¹ projection was achieved.
- For Year 2 (April 2018 – March 2019) 8 179 GWh² (96%) were achieved against the same P50¹. There has been little variation in energy generation achieved year on year.
- For the 56 projects, individually 44 IPPs (79%) achieved greater than 90% of their P50¹ projection in the first year of operation, and 45 (80%) accomplished this in the second year of operation as well.

Again it can be seen from the graphs shown on the left that the Solar PV plants are performing better in achieving their P50¹ projections.

- Solar PV – Of the 56 projects that have been operational for more than a two year period, 33 are Solar PV. For the time periods, Year 1 and Year 2, these 33 projects generated 3 338 GWh² (105%) and 3 330 GWh³ (104%) respectively against their targeted P50¹ projection of 3 194 GWh. Individually 25 projects in Year 1 and 22 projects in Year 2 have exceeded their P50¹ projections. When comparing the energy generation achieved year on year per project, there has been little variation. Only 4 of the 33 projects showed greater than a 5% difference (increase or decrease year on year).
- Onshore wind – Of the 56 projects that have been operational for more than a two year period, 17 are Onshore wind. For the time periods, Year 1 and Year 2, these 17 projects generated 4 106 GWh² (94%) and 4 075 GWh³ (93%) respectively against their targeted P50¹ projection of 4 380 GWh. In Year 1 and 2, three and four individual projects exceeded their P50¹ projections, respectively.

Note: Generation data has not been received from Eskom since August 2016. The IPPPP Office has created a standard template for generation data information exchange. The IPPs are requested to populate and return it to the IPPPP Office on a monthly basis in order to perform more current and frequent assessments reports to the IPPPPP Office and the DoE.

Note 1. Refer to explanatory notes at end of this report for the definition. Note 2. Energy figure understated. Latest quarterly figures not received from some IPP’s. To be corrected next reporting period.
Reserve margin\textsuperscript{1} contribution

The NDP targets an improvement in the reserve margin during the MTSF\textsuperscript{2} planning horizon (until 2019) from 1\% to 19\% (Outcome 6).

Even though renewable energy production does not align directly with the defined system peaks, the current operational portfolio is contributing to the percentage buffer between the available supply and projected demand on the electricity system.

A 24 hour profile representing the total energy generated by the complete portfolio shows that in a quarter period (March 2016 to June 2016)\textsuperscript{5} a 13\% contribution was made during the morning and evening system peak periods\textsuperscript{3} (15\% since inception up to June 2016)\textsuperscript{5}.

As the energy mix diversifies with the inclusion of CSP with storage, biomass and landfill gas, the share of renewable energy available during peak periods should increase.

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Note 1. Reserve margin is the measure of available capacity over and above the capacity needed to meet normal peak demand levels. Reserve margin and reserve capacity are synonymous. Note 2. Medium Term Strategic Framework. Note 3. As defined by the Megaflex tariff: 07:00 – 10:00, 18:00 – 20:00 excluding weekends, public holidays. Note 4. Energy figure understated. Latest quarterly figures not received from some IPPs. To be corrected next reporting period. Note 5. Hourly profile reported as for March 2016 to June 2016 quarter as updated figures are not available.
The REIPPPP contribution:

Investment, economic, social and environmental footprint

Outcomes 4, 5, 7, 8, 10, 11 and 14
Attracting significant investment into the South African economy

<table>
<thead>
<tr>
<th>Committed investments³</th>
<th>Bid window 1 to 4, 1S2 &amp; 2S2 (Rand billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>209.7</strong> Rand billion</td>
<td>Committed (total project costs¹) for IPP</td>
</tr>
<tr>
<td></td>
<td>development in BW 1 to 4, 1S2 &amp; 2S2</td>
</tr>
<tr>
<td><strong>R41.8 billion</strong></td>
<td>of which</td>
</tr>
<tr>
<td></td>
<td>from foreign investors and financiers</td>
</tr>
</tbody>
</table>

### Investment attracted

The REIPPPP has attracted significant investment in the development of the REIPPs into the country. The total investment (total project costs¹), including interest during construction, of projects under construction and projects in the process of closure is R209.7 billion³ (this includes total debt and equity of R209.2 billion, as well as early revenue and VAT facility of R0.5 billion).

An analysis of the funding sources² and shareholding highlights the broad spectrum of participation and benefits that emanate from this investment.

The REIPPPP has attracted R41.8 billion³ in foreign investment and financing in the seven bid windows (BW1 – BW4, 1S2 and 2S2).

Whilst retaining shareholding for South Africans is a priority, the associated influx of foreign investment and funding is also of significance to the economy. The NDP (Outcome 11) sets a target of a R230 billion increase in FDI (facilitated by the dti) by 2019.

Financing and Investments (equity and debt), originate from a variety of countries across the globe, with Europe and the USA representing the largest sources of finance.

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**Note 1.** Total Project Costs means the total capital expenditure to be incurred up to the commercial operations date in the design, construction, development, installation and/or commissioning of a project, which is equal to the total debt and equity related to a project as reported at commercial close. **Note 2.** This analysis is based on Financial Close for BW1, BW2, BW3, BW3.5 and BW4, and RFP for 1S2 and 2S2. Note this may result in minor discrepancies with reported numbers elsewhere in the report. **Note 3.** BW4 data updated to Financial Close data.
The FDI analysis identified at least 23 different countries, including two from Africa, that have participated in providing financing and/or equity to IPPs.

The share of foreign investment and equity showed an increase in the most recent bid window (2S2), suggesting that the REIPPPP continued to garner investor confidence, despite overall economic decline in South Africa.

South African citizen shareholding

The importance of retaining shareholding in IPPs for South Africans was recognised and incorporated into the procurement conditions, requiring that at least 40% of each project should be owned by South African entities with level 5 contributor status.

The South African (local) equity shareholding across BW1 to BW4, 1S2 and 2S2 equates to 52% (R31.5 billion) of total equity (R61.0 billion), which is substantially more than the 40% requirement. Foreign equity amounts to R29.5 billion and contributes 48% of total equity.

Note 1. UK, Ireland and British Virgin Island. Note 2. Including Mauritius. Note 3. As stated in the RFP Part B, bidders are required to have a South African Entity Participation of 40% and in order to be evaluated further, bidders are required to have a Contributor Status Level of 5 (this requirement is only in respect of entities that are based in South Africa). Minimum thresholds for shareholding were removed for small RE projects.
Ownership
Actual % vs target (active projects)\(^1\)

Shareholding (Black people total)

<table>
<thead>
<tr>
<th>BW1</th>
<th>BW2</th>
<th>BW3</th>
<th>BW3.5</th>
<th>BW4</th>
<th>BW1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Threshold 33% vs 30% target

Shareholding (Black people in local communities)

<table>
<thead>
<tr>
<th>BW1</th>
<th>BW2</th>
<th>BW3</th>
<th>BW3.5</th>
<th>BW4</th>
<th>BW1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Threshold 9% vs 5% target

Black shareholding in EPC contractor

<table>
<thead>
<tr>
<th>BW1</th>
<th>BW2</th>
<th>BW3</th>
<th>BW3.5</th>
<th>BW4</th>
<th>BW1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Threshold 21% vs 20% target

Black shareholding in operating company\(^2\)

<table>
<thead>
<tr>
<th>BW1</th>
<th>BW2</th>
<th>BW3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Threshold 21% vs 20% target

Black Top Management

<table>
<thead>
<tr>
<th>BW1</th>
<th>BW2</th>
<th>BW3</th>
<th>BW3.5</th>
<th>BW4</th>
<th>BW1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Threshold 65% vs 40% target

South African debt across BW1 to BW4, 1S2 and 2S2 equates to 91.7% (or R136.4 billion, which includes total debt of R135.8 billion and early revenue and VAT facility of R0.5 billion) of total debt (R148.7 billion). Foreign debt accounts for 8.3% (R12.4 billion) of total debt.

The REIPPPP contributes to Broad Based Black Economic Empowerment and the creation of black industrialists. Black South Africans own, on average, 33% of projects that have reached financial close (i.e. projects in BW1 – BW4\(^1\)), which is 3% higher than the 30% target. This includes black people in local communities that have ownership in the IPP projects that operate in or nearby their vicinities.

On average, black local communities own 9% of projects that have reached financial close. This is well above the 5% target.

Shareholding by black South Africans has also been secured across the value chain.

An average of 21% shareholding by black people in engineering, procurement and construction (EPC) contractors has been attained in projects that have reached financial close under the REIPPPP. This is 1% higher that the 20% target.

Furthermore, shareholding by black people in operating companies of IPPs has averaged 19% (against the targeted 20%) for the 64 projects in operation (i.e. in BW1, BW2 and BW3).

The target for shareholding by black people in top management has been set at 40%, with an average 65% achieved to date.

Note 1. Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, (1 of 2 projects) BW3.5 and BW4, and projects in operation i.e. BW1, BW2 and (16 of 17 projects) BW3.

Note 2. Actuals for projects in operation i.e. BW1, BW2 and (16 of 17 projects) BW3.

Refer Page 11 & 12 for detail of the targets and thresholds across bid windows.
Community shareholding and community trusts

A minimum ownership by local communities in an IPP of 2.5% is required as a procurement condition. In this way a substantial portion of the investments has been structured and secured as local community equity. An individual community’s dividends earned will depend on the terms of each transaction corresponding with the relevant equity share.

To date all shareholding for local communities have been structured through the establishment of community trusts. For projects in BW1 to BW4, 1S2 and 2S2, qualifying communities will receive R26.9 billion net income over the life of the projects (20 years). The bulk of the money will however only start flowing into the communities from 2028 due to repayment obligations in the preceding years (repayment obligations are mostly to development funding institutions).

The figure shows the projected net income for the first seven bid windows (BW1 – BW4, 1S2 and 2S2). If the net projected income was structured as equal payments over time, it would represent annual net income of R1.34 billion per year.

It should be noted that for the small-scale RE projects, the minimum threshold (mandatory obligation) for local community ownership was removed. This is aligned with the current review of the procurement process to address their cash flow concerns (refer key learning).

Small projects that selected to offer shareholding to the local community did however receive additional points during the tender evaluation. Four of the ten 1S2 and seven of the ten 2S2 small IPPs have structured their shareholding to include community trusts.

Income to all shareholders only starts with operations. Revenue generated to date, by the 64 IPPs that are operational, amounts to R74.4 billion.

However, even with more projects operational and revenues growing, quarterly reports are unlikely to show large cash flows to communities until debt has been fully serviced.

Key learnings

Opportunities or alternate vehicles to be investigated that will enable a more even distribution of community trust cash flow and realising community benefits sooner.

Note 1. Income and costs expressed in nominal terms. Net income in real terms equates to R111.5 billion (as opposed to R27.1 billion in nominal terms) under assumption of constant inflation rate of 5.7%. Note 2. For BW1 – BW4, 1S2 and 2S2. Note 3. Over the operational project life of 20 years. Note 4. BW4 data updated to Financial Close data.
Investment by technology type

Wind, solar PV and solar CSP have attracted the most significant share of the investment in the first seven bid windows.

By comparison, solar CSP project costs per MW are higher, given the relatively small number of megawatts (600 MW) procured for the R58.4 billion spent (vs. 3 366 MW of wind and 2 372 MW of PV capacity at the indicated costs). However, it should be noted that CSP technology offers inherent storage capacity, allowing energy to be fed into the grid when needed after sunset. Similarly, landfill gas and biomass are less dependent on intermittent energy source availability. At the same time, energy available during system peaks (typically early morning and early evening) have a higher value, partially justifying the seemingly higher capacity cost associated with the renewable technologies that can also supply energy during these periods.

The IRP 2010-2030 (2013 update report circulated for stakeholder consultation, but not promulgated) included an indicative R/kW overnight² capital cost per technology type (in 2012 Rand terms)³. The average portfolio project costs and project value⁴ per MW for each technology type are relatively well aligned with the 2012 costs anticipated in the IRP 2013 update report. Note this is not a direct comparison (refer respective definitions of Total Project Cost, Project Value and Overnight costs and the different dates of the reported values), but rather an indication of cost range magnitudes.

Note 1. It should be noted that the cost per MW is a simplistic measure and not an accurate comparison of the cost of generation technologies. Comparisons for energy costs and investment decisions are best based on the levelised cost of the energy (over the life of the asset) generated, as well as the key application purpose (base-load, mid-merit or peaking) of the technology. Note 2. The capital cost of a project if it could be constructed overnight. This cost does not include the interest cost of funds used during construction. Note 3. IRP 2010 - 2030, Updated Report. Technology costs input (tables 18 - 20) [as at 2012, without learning curves]. Note 4. Refer IA definitions in Appendix A.

Technology share of investment

<table>
<thead>
<tr>
<th>Total Project Costs (Rand billion)</th>
<th>Technology share of investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>R80.6 billion</td>
<td>38%</td>
</tr>
<tr>
<td>R65.9 billion</td>
<td>31%</td>
</tr>
<tr>
<td>R58.4 billion</td>
<td>28%</td>
</tr>
<tr>
<td>R1.1 billion</td>
<td>0.5%</td>
</tr>
<tr>
<td>R3.4 billion</td>
<td>2%</td>
</tr>
<tr>
<td>R0.3 billion</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

Average investment per MW for each technology group¹

<table>
<thead>
<tr>
<th>Technology</th>
<th>Average investment cost (Rand million/MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>24</td>
</tr>
<tr>
<td>Solar PV</td>
<td>28</td>
</tr>
<tr>
<td>Solar CSP</td>
<td>97</td>
</tr>
<tr>
<td>Landfill Gas</td>
<td>59</td>
</tr>
<tr>
<td>Biomass</td>
<td>66</td>
</tr>
<tr>
<td>Storage</td>
<td>21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tech</th>
<th>IRP 2010 (2013) Rm/MW</th>
<th>REIPPPP Rm/MW (Project Value)</th>
<th>REIPPPP Rm/MW (Total project costs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>15</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Solar PV</td>
<td>29</td>
<td>22</td>
<td>31</td>
</tr>
<tr>
<td>Solar CSP</td>
<td>48</td>
<td>63</td>
<td>89</td>
</tr>
</tbody>
</table>

Note 1. It should be noted that the cost per MW is a simplistic measure and not an accurate comparison of the cost of generation technologies. Comparisons for energy costs and investment decisions are best based on the levelised cost of the energy (over the life of the asset) generated, as well as the key application purpose (base-load, mid-merit or peaking) of the technology. Note 2. The capital cost of a project if it could be constructed overnight. This cost does not include the interest cost of funds used during construction. Note 3. IRP 2010 - 2030, Updated Report. Technology costs input (tables 18 - 20) [as at 2012, without learning curves]. Note 4. Refer IA definitions in Appendix A.
Broader economic and socio economic impacts

In addition to the financial investments into the economy and favourable equity structures that had been secured, the REIPPPP is targeting broader economic and socio-economic developmental benefits.

Bid obligations and minimum thresholds for preferential procurement, employment equity and socio-economic development contributions are utilised as mechanisms to capture a share of the value/prosperity from the programme for South Africans and local communities.

Procurement spend

Procurement spend constitutes a significant share of the total project costs for the portfolio of IPPs. The total projected procurement spend for BW1 to BW4, 1S2 and 2S2 during the construction phase is R73.1 billion, while the projected operations procurement spend over the 20 years operational life is estimated at R76.8 billion. The combined (construction and operations) procurement value is projected as R149.9 billion, of which R63.1 billion has been spent to date. For construction, of the R55.7 billion already spent to date, R51.1 billion is from the 64 projects which have already been completed. These 64 projects had planned to spend R50.4 billion. The actual procurement construction costs have therefore exceeded the planned costs by 1% for completed projects.

Construction procurement spend has grown steadily over time as the construction of the IPP portfolio advances.

**Table:**

<table>
<thead>
<tr>
<th>Total procurement spend¹ (Rand billion)</th>
<th>Planned³</th>
<th>actual (inception to date + Q)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>86.8</td>
<td>78.0</td>
</tr>
<tr>
<td>Of which construction spend¹ (Rand billion)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>55.7</td>
<td>55.7</td>
</tr>
<tr>
<td>Of which operations spend (Rand billion)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>69.3</td>
<td>65.2</td>
</tr>
</tbody>
</table>

Note 1. Procurement spend and preferential procurement spend patterns are not linear, the ratios are therefore preliminary and indicative only pending the final procurement figures. It does serve to highlight possible areas of risk. Refer to Interpretation notes for the definition of procurement spend. 

Note 2. Planned referring to all projects procured i.e. currently BW1 – BW4, 1S2 & 2S2 and Active referring to all projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, (1 of 2 projects) BW3.5 and BW4.

Note 3. BW4 data updated to Financial Close data.
Whereas in earlier quarters actual procurement spend lagged the projected spend, the reverse is true for this quarter - actual procurement spend for the portfolio to date exceeds projected spend for projects which have completed construction.

### Preferential procurement

The share of procurement that is sourced from Broad Based Black Economic Empowered (BBBEE) suppliers, Qualifying Small Enterprises (QSE), Exempted Micro Enterprises (EME) and women owned vendors are tracked against commitments and targeted percentages.

The IA target requirement for BBBEE is 60% of total procurement spend. However, the actual share of procurement spend by IPPs from BBBEE suppliers for construction and operations combined is currently reported as 86%, which is significantly higher than the target of 60%, but also the 71% that had been committed by IPPs. BBBEE as a share of procurement spend for projects in construction is reported as 87% with operations slightly lower at 73%.

While this appears to be a positive preliminary response, the reported procurement numbers do not represent the final procurement spend and the data has not been verified by the IPPPP Office. Therefore, this achievement is reported with caution.

Preferential procurement commitments are expressed as a share of total procurement. Should the final procurement spend be below the projected spend (refer to first graph on the left), the monetary value associated with the targeted percentage would also be lower. However, if the high reported preferential procurement share is confirmed, the reduced value of procurement spend should have a limited, if any, tangible monetary impact.

As expected, the majority of the procurement spend to date has been for construction purposes. Of the R55.7 billion spent on procurement during construction, R48.5 billion has reportedly been procured from BBBEE suppliers. Actual BBBEE spend during construction for BW1 and BW2 alone was R25.5 billion, 81% more than the R14.1 billion planned by the IPPPs. The R48.5 billion spent on BBBEE during construction is 87% of the R51.1 billion that had originally been anticipated by all IPPs procured.

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**Note 1.** Procurement spend and preferential procurement spend patterns are not linear, the ratios are therefore preliminary and indicative only pending the final procurement figures. It does serve to highlight possible areas of risk. **Note 2.** Planned referring to all projects procured i.e. currently BW1 – BW4, 152 & 252 and Active referring to all projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, (1 of 2 projects) BW3.5 and BW4. **Note 3.** Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, (1 of 2 projects) BW3.5 and BW4, and projects in operation i.e. BW1, BW2 and (16 of 17 projects) BW3. **Note 4.** BW4 data updated to Financial Close data.
Total procurement spend by IPPs from QSE and EMEs has amounted to R19.8 billion (construction and operations) to date, which exceeds commitments by 58%, and is 31% of total procurement spend to date (while the required target is 10%). QSE and EMEs procurement spend for construction is achieving 32% of total procurement to date and operations is less at 23%, however this is still well above the 10% target.

QSE and EME share of construction procurement spend totals R18.1 billion, which is 3.7 times the targeted spend for construction of R4.9 billion during this procurement phase.

In contrast, procurement from women owned vendors is lagging, with only 3% for construction and 6% for operations achieved to date, against a target of 5%.

When considering only construction spend of women owned vendors, R1.91 billion has been spent which is below the R1.92 billion expected to be spent on projects that have reached financial close.

26 IPPs are still in construction and still need to reach COD. For these 26 projects and those which have completed construction, procurement purchases from women owned suppliers have evidently presented a major challenge. The development of women owned businesses in the energy and construction industry is considered an opportunity for national (dfi or similar) capacity building initiatives.

Key learning
Development of women owned businesses in the energy and construction industry may benefit from capacity building initiatives.

Note 1. Procurement spend and preferential procurement spend patterns are not linear, the ratios are therefore preliminary and indicative only pending the final procurement figures. It does however serve to highlight possible areas of risk. Note 2. Planned referring to all projects procured i.e. currently BW1 - BW4, 152 & 252 and Active referring to all projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, (1 of 2 projects) BW3.5 and BW4. Note 3. Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, (1 of 2 projects) BW3.5 and BW4, and projects in operation i.e. BW1, BW2 and (16 of 17 projects) BW3. Note 4. BW4 data updated to Financial Close data.

Refer to Page 11 & 12 for detail of the targets and thresholds across bid windows.
Local content spend
(Rand billion)

Local content tracking
Actual % vs target (active projects)

Local content
Actual vs planned (operational projects)

Local content
The REIPPPP represents the country’s most comprehensive strategy to date in achieving the transition to a greener economy. Local content minimum thresholds and targets were set higher for each subsequent bid window. For a programme of this magnitude, with construction procurement spend alone estimated at R73.1 billion, the result is a substantial stimulus for establishing local manufacturing capacity.

This strategy has prompted several technology and component manufacturers to establish local manufacturing facilities. It is expected that greater certainty relating to subsequent bid windows and further determinations will continue to build on these successes.

For the portfolio as a whole, the expectation would reasonably be for local content spend to fall between 25% and 65% of the total project value (considering the range of targets and minimum requirements). Local content commitments by IPPs amount to R67.6 billion, i.e. 45% of total project value (R151.1 billion for all bid windows).

Actual local content spend reported for IPPs that have started construction amounts to R46.5 billion against a corresponding project value (as realised to date) of R90.3 billion. This means 52% of the project value has been locally procured, exceeding the 45% commitment from IPPs and the thresholds for BW1 – BW4 (25% - 45%).

As for procurement, it should be noted that the local content commitments are expressed as a percentage of total project value. With lower procurement costs, total project value is reduced, and therefore the total local content spend that is realised may also be less than planned.

To date, the R46.5 billion local content spend reported by active IPPs is 74% of the R63.1 billion local content expected. This is with 26 BW4 projects that only recently started construction, and only 64 of the 90 active projects having reached COD (i.e. 71% of the portfolio complete).

For the 64 projects that have reached COD, local content spend has been R43.1 billion of a committed R43.3 billion, which is 0.4% below the planned local content spend.

Note 1. Local content is expressed as % of total project value and not procurement or total project costs. See Appendix A for definitions for both terms. Note 2. Planned referring to all projects procured i.e. currently BW1 – BW4, 1S2 & 2S2 and Active referring to all projects that have commenced construction i.e. currently BW1, BW2, [16 of 17 projects] BW3, [1 of 2 projects] BW3.5 and BW4. Note 3. Only 16 of 17 projects in BW3 and 1 of 2 projects in BW3.5 have reached financial close and started construction. Note 4. Thresholds and targets are bid window specific and technology dependent. Note 5. BW4 data updated to Financial Close data.
Local content
Actual cumulative\(^1\) (Rand billion)

- **Active**
- **Procured**

\(\text{\textbf{74\%}}\)

Local content achieved against plan

**Construction vs operations**
Employment split (job years)

**33 019**

Of planned

**7 115**

Construction employment
Actual cumulative\(^1\) (Job years)

- **Procured**
- **Achieved**

**Construction employment**
Actual vs planned (operational projects)

**53\%**

More than planned

As for procurement, local content spend is not necessarily a constant percentage over the construction duration and depends on the specific materials and components that are locally sourced, as well as the timing of this procurement.

Considering the cumulative trend of the build portfolio, local content share has tracked consistently towards the expected spend suggesting a relatively even distribution of local content share over time.

Actual local content achieved for active projects\(^1\) totals 74\% of their commitment.

Monitoring will continue to track the final share of local content for the portfolio of projects. Reported local content figures are also subject to verification.

**Leveraging employment opportunities**

Numerous employment opportunities are being created by the REIPPPP. To date, a total of 40 134 job years\(^2\) have been created for South African citizens, of which 33 019 were in construction and 7 115 in operations.

Employment opportunities across all the five active bid windows are 101\% of the planned numbers during the construction phase (i.e. 32 602 job years), with 26 projects still in construction and employing people. The number of employment opportunities should therefore continue to grow beyond original expectations.

By end March 2019, 64 projects had successfully completed construction and moved into operation. These 64 IPPs had planned to deliver 20 689 job years during the construction phase, but achieved 31 633. This is 53\% more than planned.

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**Note 1.** Actuals tracked against Procured (all projects i.e. currently BW1 – BW4, 1S2 & 2S2) and Active (projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, (1 of 2 projects) BW3.5 and BW4. **Note 2.** The equivalent of a full time employment opportunity for one person for one year.
Employment thresholds and targets were exceeded consistently across the entire portfolio. The average share of South African citizens of total South Africa based employees for BW1 – BW4 was 89% during construction (against a target of 80%), while it was 95% during operations for BW1 – BW3 (against a target of 80%).

The construction phase offers a high number of opportunities over shorter durations, while the operations phase requires fewer people, but over an extended operating period.

Labour utilisation during construction typically shows a peak, and then decreases as construction activities finish up. This expected trend is visible in the reported numbers per quarter. Employment numbers during construction peaked in Q3 2013/14 and thereafter tapered off as more IPPs concluded construction. Construction followed the same trend from Q1 2015/16, as BW3 projects started construction, and a similar trend is evident now that BW4 projects are starting construction.

To date, 64 IPPs have started commercial operations, with an average operating duration of approximately 40.9 months.

Employment opportunities for equity categories are being tracked for the programme. Equity categories with contractual commitments include employment secured for South African citizens, black South African citizens and local communities.

To date, 33 019 job years for SA citizens were achieved during construction, which is 1% above the planned 32 602 job years. These job years are expected to rise further since BW4 projects are just starting construction.

Significantly more people from local communities were employed during construction than was initially planned. The expectation for local community participation was 13 058 job years. To date 18 253 job years have been realised (i.e. 140% more than initially planned), with 26 projects still in construction.

The number of black SA citizens employed during construction also exceeded the planned numbers by 22%.
Employment equity share of persons employed in construction
(\% job years vs total) (active projects)\(^1\)

<table>
<thead>
<tr>
<th>Black SA citizens</th>
<th>Disabled</th>
<th>Local community</th>
</tr>
</thead>
<tbody>
<tr>
<td>79%</td>
<td>0.5%</td>
<td>49%</td>
</tr>
</tbody>
</table>

Employment equity share of persons employed
Actual \% vs target (active projects)\(^2\)

- **Black citizens as \% of SA based employees**
  - Threshold: 79\%
  - Target: 83\%
  - Actual: 83\%

- **Skilled black citizens as \% of skilled employees**
  - Threshold: 67\%
  - Target: 77\%
  - Actual: 77\%

- **Local community members as \% of SA-based employees**
  - Threshold: 49\%
  - Target: 67\%
  - Actual: 67\%

Data on priority employment categories as identified by national objectives and the NDP (e.g., youths, women, people with disabilities and rural communities) is also collected.

Where these were not included in bid criteria, no planned numbers were captured and hence tracking and reporting are not against commitments or targets.

During the construction phases, black South African citizens, youths and rural or local communities have been the major beneficiaries as they respectively represent 79\%, 41\% and 49\% of total job opportunities created by IPPPs to date. However, woman and disabled people could still be significantly empowered as they represent a mere 8\% and 0.5\% of total jobs created to date, respectively.

Youth, women and rural employment numbers

Youth, women and rural employment numbers, previously excluded from mandatory reporting requirements, will be included, as far as possible, for subsequent BWs.

Nonetheless, the fact that the REIPPPP has raised employment opportunities for black South African citizens and local communities beyond planned targets, indicates the importance of the programme to employment equity and the drive towards more equal societies.

The share of black citizens employed during construction (79\%) and the early stages of operations (83\%) is significantly exceeding the 50\% target and the 30\% minimum threshold. Likewise, the share of skilled black citizens (as a percentage of skilled employees) for both construction (67\%) and operations (79\%) is exceeding the 30\% target and the minimum threshold of 18\%.

The share of local community members as a share of SA-based employees was 49\% and 67\% for construction and operations respectively – exceeding the minimum threshold of 12\% and the target of 20\%.

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**Note 1.** Actuals tracked against Active projects - referring to all projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, (1 of 2 projects) BW3.5 and BW4. **Note 2.** Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, (1 of 2 projects) BW3.5 and BW4 and projects in operation i.e. BW1, BW2 and (16 of 17 projects) BW3.
Socio-economic development (SED) contributions

An important focus of the REIPPPP is to ensure that the build programme secures sustainable value for the country and enables local communities to benefit directly from the investments attracted into the area.

As part of the bid obligations, IPPs had to commit to contribute a share of the revenue to community needs. These contributions accrue over the 20 year project lifetime and are being used for housing and infrastructure as well as healthcare, education and skills development.

IPPs are required to contribute a percentage of projected revenues accrued over the 20 year project operational life toward SED initiatives. The minimum compliance threshold for SED contributions is 1% of revenue with 1.5% the targeted level over the 20 year project operational life. A portfolio average within this range is therefore expected. However, for the current portfolio the average contribution level is 2.2% or 125% more than the minimum compliance threshold.

Across the seven bid windows, a total contribution of R23.1 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R1 153 million.

Of the total commitment, R18.8 billion is specifically allocated for local communities where the IPPs operate.

As a percentage of revenue, SED obligations become effective only when operations commence and revenue is generated. Of the 90 IPPs that have started construction (BW1 – BW41), 64 are operational.

With every new IPP on the grid, revenues and the respective SED contributions increase substantially. Also, if it was to happen that in future no IPP comes on line, revenues will grow with inflation, resulting in ever increasing benefits to the communities.

Already at this early stage, with a limited number of IPPs operational, SED contributions amount to R860.1 million to date. Of this, R81.1 million or 9% was spent in this reporting quarter.

Note 1. 16 of 17 projects in BW3 have started construction, and 1 of the 2 BW3.5 projects have started construction and is now operational. The remaining 2 projects still need to reach financial close. Note 2. BW4 data updated to Financial Close data.
For the 64 projects that are operational, the actual SED contribution of R860.1 million to date represents approximately 1.3% of total revenue generated to date. These 64 IPP projects have committed 1.5% over the 20 year project operational life.

### SED contribution categories

Enterprise and socio-economic development commitments have been made in five categories; namely, education and skills development, social welfare, healthcare, general administration, and enterprise development.

All operational IPPs are required to report on the initiatives they have engaged with to alleviate socio-economic challenges faced by the local communities in which they operate.

The distribution of the combined ED and SED spend is shown across activity categories (refer left). Education, social welfare, and health care initiatives have a SED focus.

General administration is a cross cutting activity that involves management and planning activities to inform economic development initiatives.

The SED spend on education has been almost double the expenditure on enterprise development. This is despite enterprise development being a stand-alone commitment category in terms of the IA. This is, in part, due to the fact that some early childhood development programmes have also been incorporated in educational programmes.

IPPs have supported 1 044 education institutions with a total of R236.7 million in contributions, from 2015 to the end of March 2018. These contributions have benefitted a total of 375 737 children / learners.

A total of 881 bursaries, amounting to R149.9 million, have been awarded by 50 IPPs from 2015 until the end of March 2019, with more than a third of the bursaries awarded between August 2018 and March 2019. The largest portion of the bursaries were awarded to African and Coloured students (96%), with women and girls receiving 60% of total bursaries. The Northern Cape province benefitted most from the bursaries awarded, with 58%, followed by the Eastern Cape (18%) and the Western Cape (15%).

Enterprise development and social welfare are the focal areas that have received the second highest share of the contributions to date.

---

**Note 1.** Institutions include Early childhood development centres (365), Primary (529) and Secondary Schools (150).
Challenges with the existing SED contribution framework

The IPPPP Office recognised the need to improve financing committed by IPPs for SED purposes. This is mainly because:

- Deficient coordination and alignment of IPP SED plans with other IPPs in the same localities and broader government development strategies leads to fragmentation and inefficient SED spend;
- Other than the provision of power and electricity access, IPPs are not in the business of community upliftment and thus often have difficulty in identifying areas that will effectively address SED in impacted communities;
- Sparsely populated areas have limited community absorption capacity;
- SED contributions from IPPs are concentrated within the vicinities of communities where IPPs operate, which implies that there is a lack of equity considerations across geographical areas (i.e. some communities benefit more than others); and
- IPP revenue projections and availability imply enhanced SED gains over the longer term, while short-term community gains are also required for increased social acceptance of IPPs. Currently, local communities are required to get a minimum of 2.5% equity share in IPP ownership (the target is 5.0%), which is paid into community trusts. However, this is mainly visible over the longer term since the majority of IPP nominal revenues in community trusts will peak in 10 to 15 years due to IPP debt repayments to finance institutions from the beginning of an IPP’s operation or revenue earnings.

As a result, the IPPPP Office is continuously researching alternative ways to implement SED that could be considered to offer more immediate benefits to local communities, while dealing with the equity and effectiveness concerns raised by the current approach.
Enterprise development contributions

As with SED spend, enterprise development commitments are made as percentage of revenue, and as such, obligations are effective only once an IPP starts operations. The target for IPPs to spend on enterprise development is 0.6% of revenues over the 20 year project operational life. IPPs, for the current portfolio, have committed an average of 0.63% or 0.03% more than the target.

Enterprise development contributions committed for BW1 to BW4, 1S2 and 2S2 amount to R7.2 billion. Again, assuming an equal distribution of revenue over the 20 year project operational life, enterprise development contributions would be R360 million per annum.

Until the end of this reporting period, a total of R276.7 million has been contributed to enterprise development by the 64 operating IPPs. Of the R276.7 million, R26.5 million was contributed in this quarter alone.

The trend and reporting figures are now aligned with the expectation of steady growth associated with a increasing number of operational IPPs and growing revenues.

Of the total commitment, R5.6 billion is specifically committed directly within the local communities where the IPPs operate, contributing significantly to local enterprise development. A total contribution of R254.3 million has already been made to the local communities (i.e. 92% of the total R276.7 million enterprise development contributions made to date).
Contributing to cleaner energy

Carbon emissions targets

The National Climate Change Response White Paper outlines the national response to the impacts of climate change, as well the domestic contribution to international efforts to mitigate greenhouse gas emissions.

As part of the global commitment, South Africa is targeting an emissions trajectory that peaks at 34% below a “business as usual” case in 2020, 42% below in 2025 and from 2035 declines in absolute terms.

These commitments are incorporated into the National Development Plan in Outcome 10 and sub-outcome 3. The REIPPPP contributes constructively to economic stability, energy security and environmental sustainability.

Emissions factor

Carbon emissions reduction is calculated based on a displacement of power, from largely coal-based to more environmentally friendly electrical energy generation, using a gross Eskom equivalent emissions factor of 1.015 tons CO₂/MWh. A more comprehensive approach with regards to emission factors of specific technologies is to be done in consultation with the DEA.

Outcome 10
Enhance our environmental assets and natural resources.

<table>
<thead>
<tr>
<th>Impact indicator</th>
<th>Baseline</th>
<th>2019 target</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Reduced total emissions of CO₂ (not specified, but DoE contributing to Environmental Affairs)</td>
<td>Mitigation opportunities, DEROs to be developed, M &amp; E system being developed.</td>
<td>34% reduction from “Business As Usual” by 2020 and 42% by 2025</td>
</tr>
</tbody>
</table>

Emission reductions achieved

Using this approach, the emission reductions for the programme during the preceding 12 months is calculated as 10.9 million tonnes CO₂ (Mton CO₂) based on the 10 766 GWh energy that has been generated and supplied to the grid over this period. This represents 53% of the total projected annual emission reductions (20.5 Mton CO₂) achieved with only partial operations. A total of 36.2 Mton CO₂ equivalent reduction has been realised from programme inception to date.

Carbon emission reductions
Projected using P50 (Mton CO₂)

<table>
<thead>
<tr>
<th>Projected (P50)</th>
<th>Realised (12 month period)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.5 Mton CO₂ / annum</td>
<td>10.9 Mtons CO₂ 53%</td>
</tr>
</tbody>
</table>

Note 1. Carbon accounting for South Africa, UCT, Energy Research Centre (ND). Note 2. Emission reductions associated with the projected, annual energy production (P50) for the total portfolio. Note 3. Energy (and carbon emissions) figures understated. Latest quarterly figures not received from some IPP’s. To be corrected next reporting period.
The REIPPPP contribution:

Provincial analysis

Outcomes 2 and 9
Provincial contribution

Capacity development at a glance

The IPP projects of the first seven bid windows (BW1, BW2, BW3, BW3.5, BW4, 1S2 and 2S2) were distributed across all 9 provinces of South Africa.

In the next map a quick view of the distribution of number of projects, capacity, technology types, size of projects, project status as well as the capacity share contributed from the respective bid windows per province is provided.

The objective of this map is to provide a comparison of the provinces in terms of the energy capacity build portfolio.

Other developments at a glance

The second map shows the distribution of a selection of economic and socio economic contributions resulting from the REIPPPP commitments.

Provincial snapshot

A per province view is provided later in this section and provincial reports with a detailed analysis of the level of participation and contribution in each province are available.
Provincial capacity at a glance

Where: BW | bid window; Pre-FC | before Financial Close; COD | Commercial Operating Period; EOP | Early Operating Period; Construct | Under construction; No GC | Complete No Grid Connection

Note: Capacity shown refers to contracted capacity. To date there has been a variation of 25 MW in the actual operational capacity delivered to the grid on completion. The actual operational capacity achieved is shown in the detail on each province.

Note 1. Three (3) sites with Contracted Capacity of 5 MW, 3 MW and 3 MW reached COD, while the remaining 2 sites with 1 MW and 1 MW contracted capacity are still in construction.

IPPPP Overview | March 2019
Provincial economic and socio economic development at a glance

Commitments for bid windows 1, 2, 3, 3.5, 4, 1S2 and 2S2:

- **Northern Cape**
  - 59 projects
  - R 15.0 billion
  - R 1,301 million
  - 11,068 job years

- **North West**
  - 14 projects
  - R 16,414 million
  - 68,044 job years

- **Free State**
  - 9 projects
  - R 14,569 million

- **Eastern Cape**
  - 17 projects
  - R 170 million
  - 1,709 job years

- **KwaZulu Natal**
  - 1 project
  - R 26 million
  - 246 job years

- **Western Cape**
  - 14 projects
  - R 149 million
  - 7,693 job years

- **Gauteng**
  - 6 projects
  - R 14,929 million
  - 18,139 job years

- **Limpopo**
  - 3 projects
  - R 1,061 million
  - 1,068 job years

- **Mpumalanga**
  - 2 projects
  - R 0.3 billion
  - R 29 million

**Note 1**: BW4 data updated to Financial Close data.
Province • Eastern Cape

Surface area
footprint in country

14 percent

GDP\(^1\)
Contribution to GDP in country

8 percent

Population
home to

13% of the country population

41 people per km²

Employment
EAP is employed

4 out of five

Province • Free State

Surface area
footprint in country

11 percent

GDP\(^1\)
Contribution to GDP in country

5 percent

Population
home to

5% of the country population

22 people per km²

Employment
EAP is employed

3 out of five

17 projects | 1 509 MW

Solar PV
700 MW
95%

Wind
1 440 MW
92%

1 066 MW online\(^5\)

11 721 GWh generated\(^4\)

Technology type

committed\(^7\)

Realised (R14.9 billion)

Q (R0.1 billion)

Actual\(^3\) (ITD + Q)\(^6\)

Realised (R216.1 million)

Q (R18.7 million)

R 36.2 billion\(^2\)
17% of total country

R 5 239 million\(^2\)
23% of total country

R 7 035 million\(^2\)
26% of total country

R 18 139 job years\(^2\)
16% of total country

200 MW online\(^5\)
1 702 GWh generated\(^4\)

Technology type

committed\(^7\)

Realised (R51.4 million)

Q (R5.1 million)

Actual\(^3\) (ITD + Q)\(^6\)

Realised (R3 billion)

Q (R0 billion)

R 7.4 billion\(^2\)
4% of total country

R 378 million\(^2\)
2% of total country

R 611 million\(^2\)
2% of total country

R 3 121 job years\(^2\)
3% of total country

Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5a), 2016 Estimates. Note 2. IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years). Note 3. Actuals Inception to Date (ITD) shown against total committed (BW1, 2, 3, 3.5, 4, 152 and 252) and progress is monitored against total project value, not total project cost. Note 4. Cumulative energy - figure undated as figures not received from some IPPs. To be corrected next reporting period. Note 5. Online refers to capacity of projects that have reached COD and excludes projects in Early Operations Period (EOP). Note 6. ITD – realised inception to date; Q – realised during reporting quarter. Note 7. BW4 data updated to Financial Close data.
Province • Gauteng Province

Surface area
footprint in country
1
percent

GDP¹
Contribution to GDP in country
35
percent

Population
home to
24
% of the country population

Employment
4 out of five
EAP is employed

739 people per km²

Technology type
Landfill
1.3xMW
100%

Project in bid window 3 has not commenced

1 project
8 MW online
67 GWh generated

Commitment
0.1% of total country

Actual (ITD + Q)
Realised (R0.16 billion)
Q (R0 billion)

Realised (R0.8 billion)
Q (R0.1 million)

Not reported on a quarterly basis

246 job years
0.2% of total country

Province • KwaZulu-Natal

Surface area
footprint in country
8
percent

GDP¹
Contribution to GDP in country
16
percent

Population
home to
20
% of the country population

Employment
4 out of five
EAP is employed

117 people per km²

Technology type
Biomass
1.7xMW
100%

Project in bid window 3 has not commenced

1 project
0 MW online
0 GWh generated

Commitment
0.1% of total country

Actual (ITD + Q)
Realised (R0.8 million)
Q (R0.1 million)

Realised (R0 million)
Q (R0 million)

Not reported on a quarterly basis

336 job years
0.3% of total country

Note 1. All economic data = IHS Global Insight Regional Explorer 744 (2.5q), 2016 Estimates. Note 2. IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years). Note 3. Actuals Inception to Date (ITD) shown against total committed (BW1, 2, 3, 5, 4, 152 and 252) and progress is monitored against total project value, not total project cost. Note 4. Cumulative energy – figure understated as figures not received from some IPPs. To be corrected next reporting period. Note 5. Online refers to capacity of projects that have reached COD and excludes projects in Early Operations Period (EOP). Note 6. ITD – realised inception to date; Q – realised during reporting quarter. Note 7. BW4 data updated to Financial Close data.
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Province • North West Province

Surface area
footprint in country
9 percent

Population
home to
7 % of the country population

Employment
EAP is employed
36 people per km²

6 projects | 280 MW
Solar PV
280MW
100%

Technology type
committed
R 6.4 billion²
3% of total country

actual (ITD + Q)⁶
Realised (R0.4 billion)
Q (R0.1 billion)

R 947 million²
4% of total country

Realised (R2.9 billion)
Q (R0.2 billion)

R 149 million²
0.6% of total country

Not reported on a quarterly basis

7 693 job years²
7% of total country

Province • Northern Cape

Surface area
footprint in country
31 percent

Population
home to
2 % of the country population

Employment
EAP is employed
3 people per km²

59 projects | 3 621 MW
Solar PV
1 552MW 43%

Technology type
committed
R 1 459MW 17%
Wind
1 459MW 40%

actual (ITD + Q)⁶
Realised (R137.7 billion)
Q (R48.6 million)

R 1 6574 GWh
16 574 GWh
generated⁴

R 2 125 MW online⁵
65 GWh
generated⁴

R 1 4569 million²
63% of total country

Realised (R149 million²)
Q (R807 million²)

68 044 job years²
60% of total country

Realised (26652)
Job years

Note 1. All economic data = IHS Global Insight Regional Explorer 744 (2.5q), 2016 Estimates. Note 2. IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years). Note 3. Actuals Inception to Date (ITD) shown against total committed (BW1, 2, 3, 3.5, 4, 152 and 252) and progress is monitored against total project value, not total project cost. Note 4. Cumulative energy figure understated as figures not received from some IPPs. To be corrected next reporting period. Note 5. Online refers to capacity of projects that have reached COD and excludes projects in Early Operations Period (EOP). Note 6. ITD – realised inception to date; Q – realised during reporting quarter. Note 7. BW4 data updated to Financial Close data.

IPPPP Overview | March 2019
Province • Western Cape

**Surface area**
- Footprint in country

11% **Biomass**
1% **Wind**
22% **Solar PV**

14% **GDP**

**Population**
- Home to 11% of the country population

49 people per km²

49% of the country population

**Employment**
- Out of five

EAP is employed

606 MW | 452 MW online

4 680 GWh generated

14 projects

**Technology type**
- Solar PV: 134 MW (22%)
- Biomass: 5 MW (1%)
- Wind: 467 MW (77%)

**Commitment**
- R 15.0 billion (7% of total country)
- R 1 301 million (6% of total country)
- R 1 506 million (6% of total country)

**Actuals (ITD + Q)**
- Realised (R6.7 billion)
- Realised (R98 million)
- Realised (3442)

**Job years**
- 11 068 job years (10% of total country)

Note 1. All economic data = IHS Global Insight Regional Explorer 744 (2.5q), 2016 Estimates.
Note 2. IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years).
Note 3. Actuals Inception to Date (ITD) shown against total committed (BW1, 2, 3, 3.5, 4, 1S2 and 2S2) and progress is monitored against total project value, not total project cost.
Note 4. Cumulative energy - figure understated as figures not received from some IPPs. To be corrected next reporting period.
Note 5. Online refers to capacity of projects that have reached COD and excludes projects in Early Operations Period (EOP).
Note 6. ITD – realised inception to date; Q – realised during reporting quarter.
Note 7. BW4 data updated to Financial Close data.
Appendix A

Reference component
Interpretation notes

These notes document the reporting conventions and terms as defined and practiced by the IPPPP Office, and are important for interpreting the reported numbers and statistics. A concept used in the report that corresponds with an interpretation note here has the following notation indicating the number of the relevant note.

N# e.g. N1 would refer to Note 1:

Note 1. National targets

N1. National targets for renewable energy have been set in the National Development Plan (NDP) as:

- Total renewable energy capacity developed by 2030: 17 800 MW (Outcome 10, sub-outcome 2)
- Signed renewable energy deals for 7 000 MW by 2019 (Outcome 6, Sub outcome 2, item 18)
- RE generation commissioned: 5 000 MW by 2019 (Outcome 6, Sub outcome 2, item 26)
- RE generation capacity commissioned: 7 000 MW by 2020 (Outcome 6, Sub outcome 2, item 26)

The Green Energy Strategic Infrastructure Project (SIP), that operationalises the NDP, sets the target to deliver 6 725 MW RE through IPPs by 31 March 2019².

To date, the Minister of Energy has determined in four Ministerial determinations i.e. 2011, 2012, 2015 and 2016 that 14 725 MW are to be procured from renewable energy. In terms of progress towards these targets:

- The Ministerial determinations represent approximately 83% of the 2030 target of 17 800 MW.
- The combined capacity procured in BW1, 2, 3, 3.5, 4, 1S2 and 2S2 (i.e. 6 422 MW) represents approximately 92% of the 2020 target (i.e. 7 000 MW or 5 000 MW in 2019 plus 2 000 MW in 2020) for renewable energy deals.
- The combined capacity of BW1, BW2, BW3, BW3.5 and BW4 (already commissioned or in construction phase, i.e. 6 323 MW) exceeds the 2019 target for capacity commissioned (i.e. 5 000 MW), but due to delays in the signing of the BW4 projects, it is expected that only approximately 4 000 MW will be operational by the end of 2019.

Note 2. Activity and reporting cycles

IPPPP activity and reporting cycles are directly informed by ministerial determinations, bid windows and IPP implementation schedules. The following principles should therefore be noted with regard to reporting periods, reporting frequency and expected rate of change:

- Ministerial determinations effectively translate development plans and country energy requirements into instructions for the IPPPP Office to procure. Determinations inform the procurement targets that the office aims to deliver on. Ministerial determinations and therefore procurement targets are done on an ad hoc basis and typically relevant (static) to a two or three year window period.

Note 1. Notation indicates additional notes and observations available in Appendix. Note 2. This target was not met due to delays in concluding PPAs of BW3.5 and BW4 projects with Eskom, between the time of procurement and April 2018, as well as delays in the finalisation of the IRP 2018.
- **Bid windows** represent rolling rounds in which IPPs are procured according to a specified technology mix and capacity targets / limits.

- **Capacity delivery** schedules for the respective IPPs vary depending on the size and technology type of each plant. The respective IPPs become commercially operational as they complete construction, incrementally adding capacity to the IPP portfolio in every quarter. **Targets for new generation capacity to start operations** are informed by the IPP construction schedules (i.e. Scheduled Commercial Operation Date (SCOD)) and increase quarterly in accordance with construction project plans.

Tracking, and therefore reporting, is done against these respective targets.

**Note 3. Dynamic, slow-changing and static reporting parameters**

It should be noted that some data points and parameters will not change at all or will not change significantly from quarter to quarter. As an example, unless a subsequent bid window was finalised during the reporting quarter, procurement progress will remain static from the previous quarter. Future reporting will track slow changing parameters, but will focus on dynamic parameters that show quarter on quarter progress.

**Note 4. Planned vs actual data**

Bidders are required to indicate project details relating to costs, cost structures, equity and developmental thresholds as part of their bids. Submissions are based on projections and estimates are made for the construction period (typically 2 – 4 years) as well as for the 20 years operation periods.

These projections are based on a range of forecasts related to technology performance, weather conditions, equipment cost trends, operational costs, performance and revenue. It is therefore referred to as **planned or committed.** Depending on the signed Implementation Agreement (IA) some commitments are contractually binding (bid obligations) while others are indicative only.

Where relevant and required under the IA, bidders are held to specified commitments and required to provide quarterly performance reporting against these commitments. This reflects what is reported as ‘realised’ (actual costs, labour requirements, energy generated, etc.) Data so collected is considered **actual.**

Actual data is collected as part of the monitoring and evaluation function provided by the IPPPP Office.

**Note 5. Unaudited data**

Reported (actual) data will be subject to audit by independent auditors to ensure compliance with commitments and accurate reporting.

Unless otherwise specified, actual data reported are as provided by IPPs and still subject to verification in the next quarter.

SED and ED figures may vary from quarter to quarter due to the tight deadlines between receiving the information from the Sellers and producing this report. Some verifications and clarifications only take place after this report is produced. The main area for amendments could be the SED & ED contributions and the categorisation of the contributions.

**Note 6. Construction vs operations period and spend patterns**

The duration of the construction and operations phases is very important for the correct interpretation and drawing of conclusions.

The duration of the construction periods typically ranges between 2 and 4 years, while the planned operations period of the plants is 20 years. Where projected numbers are stated as cumulative over the total periods, the order of magnitude of the numbers should be considered in this context. Attention should be paid to:

- where numbers are stated as **cumulative totals** over extended periods and where **annual figures** are used.
- how the numbers will accumulate over time i.e. whether it will be a linear or average distribution or whether there will be concentrations or spikes (e.g. back- or front-loading).
- whether the reporting parameter will be **relevant** during the **construction phase** only and/or over the **extended operations phase**.
Note 6. (continued)

Two important examples are highlighted for clarification:

1. **Spend/income patterns.** Anticipated cash flows (e.g. project costs, revenue, community trust income, development spend, etc.) are captured for an entire project, differentiating only between construction and operations periods, and stated as single values, targets or commitments as relevant.

Timing of cash flows will however vary significantly over the project life. Project costs, including procurement spend, are likely to be incurred/concentrated during the initial construction phase.

Project construction expenditure will therefore be characterised by short periods (2 – 4 years) of variable, but typically high spend that will taper off, commensurate with the coordination, delivery and completion of plant construction on site. A typical spend pattern for the construction phase is illustrated below.

### Typical construction spend profile

![Diagram showing typical construction spend profile]

The spend (and labour) requirements of the operations period are expected to have a more steady pattern related to production and maintenance of the plant, sustained over 20 years.

Revenue will also accumulate over 20 years as power is generated and sold. Similarly, development spend (a committed percentage of revenue) and community trust income (percentage of revenue) will accrue over time, starting only after operations have commenced.

**Labour requirements.** Employment numbers are reported by the IPPs in the smallest unit i.e. person months (in compliance with ED requirements). This allows for reporting of activities of various durations including specialist or ad hoc activities, and casual labour used during construction versus permanent employment for the life of the plant.

During construction there will be periods when large numbers of people are on site at a given time, but it is anticipated that employment numbers will taper off by the end of the construction period. As for spending patterns, labour activity will be more intense (i.e. more people for shorter durations of time) during construction phase as illustrated by the construction employment forecast profile for bid window 1 and 2 projects in the Northern Cape below.

**Typical construction employment profile across portfolio (two bid windows)**

![Diagram showing employment profile across portfolio]

During the operations period it is anticipated that employment numbers will remain relatively constant; longer term employment prospects will be offered, but such job opportunities / employment will be relatively low in relation to the construction period.

Reporting by the IPPPP Office is currently done in job years i.e. the equivalent of one person full time (i.e. defined in the IA as 174 hours per month for BW1 and BW2 and 160 hours per month for BW3, BW3.5, BW4, 1S2 and 2S2) employed for 12 months.

Any interpretation of reported employment numbers in terms of jobs or number of new positions created and the sustainability of these positions over time should be done with caution. For example when comparing construction phase employment numbers (job years) with accumulated job years (translated into employment numbers) over the full 20 year operations phase.

---

**Note 1.** The IA definitions differ from the definition used by the Expanded Public Works Programme (EPWP) i.e.: a Full Time Equivalent (FTE) as one person-year of employment where one person year is equivalent to 230 person days of work.
Note 7. Local content

Local content percentages should also be considered in the context of the spend patterns described above. Local content is reported as a percentage of project value and is achieved by procuring from local suppliers.

However, dependent on the procurement strategy and the components that have been earmarked to be sourced from local suppliers, the local content share need not be a constant throughout the construction period provided it constitutes the required share of project value when construction completes.

Note 8. Average bid window price calculation

The IPPPPP Office has consistently calculated and reported on the average, indexed price per technology per bid window. This reported value is a simple average of the RFP submission price expressed in 2016 terms.

In this quarterly report a portfolio average per bid window is shown as an indication / illustration of the price trends between bid windows and an indicative price comparison with new coal fired power alternatives.

Since the prices between the various technologies vary significantly, the portfolio average considers the volume of energy that is expected to be purchased from each technology type and has weighted the average price accordingly, illustrated as follows and using BW1 as example:

1. The average technology pricing was reported as:
   - PV | R3.10/kWh
   - Wind | R1.30/kWh
   - CSP | R3.02/kWh (base rate only)

2. The projected share of the annual energy production (using the P50 projection) per technology is:
   - PV | 35%
   - Wind | 51%
   - CSP | 13%

3. Therefore, the average portfolio price is calculated as:
   - Price per technology weighted by the relative share of the total annual energy generated, i.e.:
     \[(R3.10 \times 35\%) + (R1.30 \times 51\%) + (R3.02 \times 13\%) = R2.15/kWh \text{ (rounded)}\]

Should the entire portfolio generate power consistently as projected (P50), the average price paid for all energy generated in a year will be R2.15/kWh.

4. The CSP price in BW3 onwards consists of a base rate and a peak rate component. The BW3 rate has therefore been adjusted to incorporate an estimated share of energy generated during contracted peak when the base rate applies.

The calculations above remain only an estimate as:

1. Projections of annual energy production are subject to a range of variables and are by nature uncertain.

2. The technology price average is a simple average, without consideration of the respective IPP’s energy contribution.

3. The relative share of base vs peak energy that will be supplied by the CSP IPPs (share to which peak rate will apply) is an estimate.

Note 9. Quarter convention

Quarters 1, 2, 3 and 4 are used to refer to quarters of the relevant financial year i.e.:

- Quarter 1 | April – June
- Quarter 2 | July - September
- Quarter 3 | October – December
- Quarter 4 | January – March

Where reference is made to a calendar quarter, such exceptions will be indicated as such.
Note 10. Capacity, energy and capacity factors clarified

A megawatt hour (MWh) measures or describes the amount of power generated or consumed in a certain amount of time.

If a 1 MW\(^1\) wind turbine runs for 1 hour it produces a total of 1 MWh of energy.

Operational time for different generation technologies vary, depending largely on the availability of the energy resource. For example, wind turbines will only generate power when the wind blows and solar PV plants will only generate while the sun shines.

Over a full year, different technologies are projected to be operational for an average percentage of hours. This depends on various factors including geographic location and the availability of the energy resource, but also operational efficiencies, down-time required for maintenance, etc.

A capacity factor (that considers the availability of the technology and energy resource type) is typically used to project the annual energy production of a particular technology or plant.

A capacity of 1 MW\(^p\) for one technology is therefore not necessarily equivalent in energy output to that of another technology. However, because the availability of energy resources (e.g. sun or wind) also varies in different locations and because operation and maintenance requirements may vary, the energy output from different projects using the same or a similar technology but located in different areas of the country may also have different energy outputs per year.

Similarly, on the consumer side, the energy consumption differs amongst households.

If a 1 kW appliance runs for 1 hour it uses a total of 1 kWh of energy.

The more appliances a household has and uses, the higher its energy consumption is likely to be. High energy use is therefore typically associated with higher LSM\(^2\) households. The following scale represents an indicative range of energy use in different South African household types\(^3\).

Average annual energy use kWh per annum per household type

<table>
<thead>
<tr>
<th></th>
<th>Free Basic Electricity</th>
<th>Mid-income</th>
<th>High-income</th>
</tr>
</thead>
<tbody>
<tr>
<td>average</td>
<td>600</td>
<td>3 319</td>
<td>9 288</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11 697</td>
</tr>
</tbody>
</table>

To estimate an average number of homes that can be powered with a given amount of energy, the annual usage for an average South African home (indicated in the frame above as 3 319 kWh), is used.

Then 1 GWh will provide power to approximately 301 households.

Note 1. Subscript \(p\) refers to the peak rated capacity i.e. the maximum capacity the specific generator can produce if all other variables are optimal e.g. wind blowing steadily at a suitable speed. Note 2. Living Standard Measure, most widely used market segmentation tool that considers households according to their living standards using criteria such as degree of urbanisation and ownership of e.g. cars and major appliances. Note 3. Free Basic Electricity (FBE), www.energy.gov.za: Average household use based on Eskom residential consumption and Amps data for number of electrified homes (2013); Mid-income usage data as published by City of Cape Town, Smart Living Handbook; High income household usage from SWH and heat pump monitoring data. http://www.environment.co.za/environmental-issues-news/measuring-residential-electricity-savings-in-south-africa-after-solar-ar-heat-pump-installations-a-simple-reliable-method.html; Referenced against World Energy Council data for household electricity consumption in South Africa(4 389 kWh/year) in 2010.
Note 11. Equivalent homes

Based on the current REIPP PPP portfolio of technologies and average contracted annual energy production, 1 MW capacity of each technology would power:

### Number of households per technology type (1 MW unit) (thousand)

<table>
<thead>
<tr>
<th>each</th>
<th>associated energy</th>
<th>number of homes ‘000</th>
<th>FBE</th>
<th>average</th>
<th>mid - income</th>
<th>high</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MW GWh</td>
<td>3.5</td>
<td>5.9</td>
<td>1.1</td>
<td>0.4</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.9</td>
<td>6.5</td>
<td>1.2</td>
<td>0.4</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.3</td>
<td>3.8</td>
<td>0.7</td>
<td>0.2</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.4</td>
<td>10.7</td>
<td>1.9</td>
<td>0.7</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.6</td>
<td>9.3</td>
<td>1.7</td>
<td>0.6</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.5</td>
<td>9.1</td>
<td>1.7</td>
<td>0.6</td>
<td>0.5</td>
<td></td>
</tr>
</tbody>
</table>

For the portfolio of REIPPPs in BW1 – 252 the average capacity factors, as contracted, per technology type, vary from 26% - 90%.

### Average capacity factors

<table>
<thead>
<tr>
<th>Percentage per technology type</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBE</td>
</tr>
<tr>
<td>39%</td>
</tr>
</tbody>
</table>

Energy that will be generated over a full year of operation by those IPPs that are already operational is projected to be 11 871 GWh. This power, that is already available to the system, would be adequate to supply:

### Total projected number of households

<table>
<thead>
<tr>
<th>million</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.78</td>
</tr>
<tr>
<td>3.58</td>
</tr>
<tr>
<td>1.28</td>
</tr>
<tr>
<td>0.95</td>
</tr>
</tbody>
</table>

This represents 3.58 million average South African households. For the solar PV, wind, CSP and small hydro IPPs that have completed construction, the installed capacity has generated enough energy (based on Average Annual Normal Days Energy) to provide power to:

### Number of households per technology type (thousand)

<table>
<thead>
<tr>
<th>total installed</th>
<th>average annual GWh</th>
<th>number of homes ‘000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 980</td>
<td>6 158</td>
<td>10 264</td>
</tr>
<tr>
<td>1 474</td>
<td>3 330</td>
<td>5 549</td>
</tr>
<tr>
<td>500</td>
<td>1 571</td>
<td>2 619</td>
</tr>
<tr>
<td>14</td>
<td>72</td>
<td>120</td>
</tr>
</tbody>
</table>

The average annual production figures shown above consider energy production over the actual operating period; extrapolated to a full year. For the portfolio of wind power plants already operational, this suggests an actual capacity factor of ~36% and for the portfolio of solar PV plants, a capacity factor of ~26% that have been achieved.

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**Note 1.** Capacity factors weighted with the contracted P50 energy contribution per IPP to determine a weighted average per technology type.

**Note 2.** Not all IPPs have been operational for a full year at the time of this report. The projection used is an extrapolation of energy generated for full 12 months, and does not take account of energy generated during early operations. **Note 3.** Installed 25 MW below contracted capacity. **Note 4.** Energy figure understated. Latest quarterly figures not received from some IPPs. To be corrected next reporting period.

IPPPP Overview | March 2019
Note 12. The REIPPPP competitive bidding procurement process

The development of new generation capacity is steered by South African planning and electricity policy frameworks (such as the Integrated Resource Plan or IRP) and given effect by Ministerial determinations. The process of Ministerial determinations provides suitable process flexibility to allow adjustments to accommodate power system requirements and technology developments and price trends. Within the scope of determined capacity, each IPPPPP bid round is initiated with a DoE procurement instruction detailing a capacity allocation (or cap) and targeted technology mix.

The REIPPPP bid process comprises six distinct stages:

**Stage 1: Request for Proposals (RFP)**

A bid round or bid window is opened with a request for proposals (RFP) issued to the market.

**Stage 2: Bid submission**

Interested bidders prepare and submit bid submissions in response to the RFP within specified timelines. As minimum qualification criteria, every project has to show a very advanced stage of development, as demonstrated by:

- Having secured land rights to the project site via ownership, leases or options;
- Having certain permits in place, most notably an authorisation under the country’s environmental legislation;
- Having the whole project structure finalised, complete with technology suppliers, EPC contractors and financiers (both equity and debt);
- Fulfilling a range of technical requirements such as a yield assessment based on at least 12 months of measurements or data;
- Meeting minimum economic development requirements such as job creation and localisation;
- Offering an electricity tariff that is equal to or less than the technology tariff cap R/kWh (if applicable); and
- Providing a bid guarantee to Government.

**Stage 3: Preferred bidders announced**

Qualifying bid submissions are adjudicated during an extensive evaluation process using independent advisors before preferred bidders are announced by the DoE.

**Stage 4: Financial close (signing of Implementation agreement and Power Purchase agreement)**

Preferred bidders are then required to finalise and sign all project and financing agreements (where applicable) and meet all required conditions contained in them, to reach financial close.

**Stage 5: Construction**

Following financial close the construction phase for the IPP facilities commences. Each facility procured in terms of the REIPPPP is required to complete construction and achieve commercial operation by not later than the dates set out in the RFP. Within this prescribed window period, each IPP is contracted to their targeted commercial operation date (COD).

**Stage 6: Commercial Operation Date (COD)**

Commercial operation date marks the successful completion and grid integration.
Definitions and terminology

Contract definitions and terminology

As per the definitions in the REIPPPP Implementation Agreements (IA) and Power Purchase Agreement (PPA):

- “Capital Expenditure” means any expenditure treated as capital expenditure under GAAP.

- “Commercial Energy Rate” means the rate per MWh applicable to Commercial Energy.

- “Commercial Operation Date (COD)” means the date specified in the Notice of Commencement of Facility i.e. it is the date on which the Independent Engineer ascertains that the Facility is completed, connected to the Grid and able to generate power.

- “Contracted Capacity” means the anticipated Capacity of the Facility at the Delivery Point and expressed as AC power capacity, net of auto-consumption and the electrical losses up to the Delivery Point.

- “Contract Quarter” means the periods:
  (a) 1 April to 30 June;
  (b) 1 July to 30 September;
  (c) 1 October to 31 December; and
  (d) 1 January to 31 March.

Should the Effective Date fall within any of the periods referred to above (and not commence on 1 April, 1 July, 1 October or 1 January), then the first Contract Quarter shall commence on the Effective Date and shall be the remaining portion of the Contract Quarter in which the Effective Date falls, plus the next Contract Quarter.

- “Contract Year” means each twelve (12) Contract Month period commencing at 00:00 hours on 1 April and ending at 24:00 hours on 31 March of the following year provided that:
  (a) the first Contract Year shall commence at 00:00 hours on the first day after the Effective Date and shall end at 24:00 hours on 31 March of the following year; and
  (b) the final Contract Year shall end at 24:00 hours on the Termination Date.

- “CPI” means the weighted average consumer price index (Dec 2012 = 100) as published by Statistics South Africa (or its equivalent successor entity), which is referred to as “Headline CPI – All urban areas” in Statistical Release P0141 from time to time (or equivalent successor index).

- “Deemed Energy” means that Energy Output that would otherwise be available to the Buyer, but for a System Event or a Compensation Event, as determined in accordance with Schedule 6 (Deemed Energy Payment).

- “Deemed Energy Payment” means an amount (excluding VAT) that shall be due and payable by the Buyer to the Seller for the Deemed Energy during a specified period pursuant to the provisions of clause 14 (Consequences of a System Event), which payment shall be calculated in accordance with Schedule 6 (Deemed Energy Payment) with reference to the Commercial Energy Rate, and dependent on the period in respect of which such payment is due and payable.

- “Direct Agreement” means the direct agreement entered into (or to be entered into) between the Buyer, the Seller, the DoE and the Lenders (or their agent) in relation to the PPA and the Implementation Agreement.

- “GAAP” means generally accepted accounting practice in the Republic of South Africa as approved from time to time by the South African Accounting Practices Board.
Definitions and terminology

- "Implementation Agreement" means the implementation agreement to be entered into between the Seller and the DoE.

- "Local Content" means the portion of the Total Project Value that is in respect of South African Products.

- "NERSA" – refers to the National Energy Regulator of South Africa, established pursuant to Section 3 of the National Energy Regulator Act, 40 of 2004.

- "Operating Expenditure" means any expenditure treated as operating expenditure under GAAP.

- "Operating Period" means the period from the later of the Commercial Operation Date and the Scheduled COD to the Termination Date.

- "Overnight Cost" refers to the cost of a construction project if no interest was incurred during construction, as if the project was completed "overnight" (see also Total Project Cost, definition B).

- "PPA" means the power purchase agreement to be entered into between a Project Company, as the Seller, and the Buyer pursuant to the IPP Procurement Programme.

- "P50 / P90" – refers to probabilities for annual energy production which are expressed as P values. A P50 figure is the level of generation that is forecasted to be exceeded in 50% of years over a 10 year (or sometimes 20 year) period. Similarly, a P90 figure is the level of generation that is forecasted to be exceeded in 90% of years over a 10 year period – in other words, the risk that an annual energy production of P90 is not reached is 10%.

- "Procurement spend" – refer to "Total Amount of Procurement Spend".

- "Total Amount of Procurement Spend" means the monetary spend on the procurement of goods and services for purposes of undertaking the Project Activities (without double counting), excluding costs of imported goods and services, taxation, salaries and wages.

- "Total Project Cost" means:
  
  (a) for the purposes of calculating the Development Fee, an amount equal to the aggregate of the total Debt and Equity which is, as at the Signature Date, forecast in the Financial Model to be contributed up to the Commercial Operation Date; and
  
  (b) for all other purposes, the total capital expenditure to be incurred up to the commercial operations date in the design, construction, development, installation and/or commissioning of a project, which is equal to the total debt and equity related to a project as reported at commercial close.

- "Total Project Value" means the total project cost that involves the capital costs and costs of services procured for the construction of a project, but excludes finance charges, land costs, mobilisation fees to the operations contractor and the costs payable to the distributor, national transmission company and/or a contractor for the distribution or transmission connection works.

Other definitions and terminology used in this report

- **Job years.** Employment / Job creation is reported in job years (i.e. the equivalent of a full time employment opportunity for one person for one year).

- Employment numbers are expressed as a percentage of the sum of StatsSA reported employed and unemployed numbers.
Glossary of icons

These icons are used in the document to represent the following concepts:

- **Gross Domestic Product** (percentage indicating the contribution share)
- **9 broad economic sectors** as defined in the International Standard Industrial Classification (ISIC) and reported on by StatsSA

### ENERGY (P50)
Energy (kWh, MWh or GWh) production / generation projected with a 50% probability that it will be achievable for the established capacity

### CAPACITY
Generation capacity (kW, MW or GW) i.e. the rated output capability of the power plants

### Renewable energy source | technology type:

- **SOLAR**
  - Solar PV (photovoltaic)
  - Solar CSP (Concentrated Solar Power)
- **WIND**
  - Wind generation
- **HYDRO**
  - Small hydro
- **BIO**
  - Biomass
- **WASTE**
  - Landfill gas / waste to energy

### Performance Measures

- **Total project costs**
- **Community trust (community equity / shareholding)**
- **Procurement spend**
- **Localisation / local content**
Glossary of icons (continued)

These icons are used in the document to represent the following concepts:

- **Socio-economic development**
- **Employment / Job creation measured in job years (equivalent of a full time employment opportunity for one person for one year)**
- **Enterprise development**
- **Black South African citizen**
- **Women**
- **Youth**
- **People with disabilities**
- **Construction phase**
- **Operations phase**
- **Key learnings**
- **Looking forward / next focus**
- **Risks**
- **Price**
- **Revenue**
- **Local community share** (used to indicate where a measure pertains to a community local to where the IPPs are)
- **Small RE projects**

**Colour convention used [RGB]**

Colours used to denote technologies:

- **Solar PV** [220 | 89 | 36]
- **CSP** [245 | 149 | 1]
- **Wind** [82 | 109 | 176]
- **Landfill, hydro, biomass, biogas (when treated as a group e.g. IRP)** [209 | 40 | 46]
- **Hydro** [151 | 167 | 208]
- **Landfill** [152 | 154 | 172]
- **Biogas** [180 | 179 | 146]
- **Biomass** [155 | 187 | 89]

**IPPPP Office**

**Contact information**

Address: Bylsbridge Office Park, Building 9, cnr Jean and Olievenhoutbosch Ave, Centurion

Telephone: +27 (0)87 351 3000

Website: www.ipp-projects.co.za