



Independent Power Producers Procurement Programme (IPPPP)

An Overview

As at 31 December 2016



energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA



national treasury

Department:
National Treasury
REPUBLIC OF SOUTH AFRICA



DBSA

Development Bank
of Southern Africa

Executive summary

N9¹

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The purpose of this report is to provide an overview of the activities of the IPPPP Office for reporting quarter 3 of the 2016/2017 Financial Year (1 October to 31 December 2016).

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 IPPPP Office for the specific purpose of delivering on the IPP procurement objectives. In May 2016, a new Memorandum of Agreement (MoA) was agreed by all parties to provide the necessary support to the IPPPP Office, to implement the IPPPP, for a further 3-year period.

The **primary mandate** of the IPPPP 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 also has a substantial influence on economic growth and socio-economic development. As such, the IPPPP 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 the broadening of economic ownership.

The Integrated Resource Plan (IRP) 2010-2030² 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, which is to be imported from the southern African region.

The IPPPP 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 MW³ 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, provide a greater level of certainty to investors. Determinations of 30 115 MW⁴ across all technologies have already been made by the Minister of Energy.

The scale and scope of electricity infrastructure development under the IPPPP 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.

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 December 2016 Overview Report

The quarterly progress overview is largely focused on the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), due to the advanced implementation status of the programme relative to other energy source-based programmes that falls within the mandate of the IPPPP Office.

The report comprises two sections and one appendix, namely:

- **IPPPP 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 as they relate to energy supply capacity building, national investment, socio-economic, and climate change impacts, as well as provincial and community impacts.
- **Appendix A:** contains reference notes, definitions and terminology.

Quarter highlights

In the Large REIPPPP, three projects started commercial operations this quarter contributing 165 MW to the grid. All projects in BW1 and BW2 are now operational. By the end of December 2016, the REIPPPP had made the following significant impacts:

Energy supply capacity impact:

- 6 422 MW¹ of electricity had been procured from 112 RE Independent Power Producers (IPPs) in seven bid rounds²;
- 2 902 MW of electricity generation capacity from 54 IPP projects has been connected to the national grid;
- 13 098 GWh⁷ 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 54 projects that have reached COD, 40 projects have been operational for longer than a year. The energy generated over the past 12 month period for these 40 projects is 5 087GWh⁷, which is 94% of their annual energy contribution projections (P50)³ of 5 401 GWh over a 12 month delivery period. Twenty four of the 40 projects (60%) have individually exceeded their P50 projections.

Investment, economic, social and environmental impacts:

- Investment (equity and debt) to the value of R201.8 billion⁹, of which R48.8 billion⁹ (24%) is foreign investment, was attracted;
- Created 29 888 job years⁴ for South African citizens, or 33 916 jobs (FTEs⁵) for South African citizens;
- Socio-economic development contributions of R298.8 million to date, of which R42.7 million was spent in this reporting quarter;
- Enterprise development contributions of R94.6 million to date, of which R14.2 million was spent in this reporting quarter;
- Carbon emission reductions⁶ of 13.3Mton CO₂⁸ has been realised by the programme inception to date.

Caveat. This report and all analysis include all data reported by IPPs for quarter 3 of 2016/17 FY, as received by 27 January 2017. Any data updates from IPPs after this date will be incorporated and reflected in subsequent reporting periods.

Note 1. 6 327MW from 92 large scale RE + 49MW from 10 small scale RE IPPs. **Note 2.** Bid windows 1, 2, 3, 3.5, 4 and smalls (1S2). **Note 3.** As defined by the Megaflex tariff: 07:00 – 10:00, 18:00 – 20:00, excluding weekends and public holidays. **Note 4.** The equivalent of a full time employment opportunity for one person for one year. **Note 5.** Person months (reporting unit of IPP agreements) converted to FTEs as per EPWP definition. **Note 6.** 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 CO₂/MWh. **Note 7.** Energy figure understated. Latest quarterly figures not received from some IPP's. To be corrected next reporting period. **Note 8.** Carbon emission reductions figure understated as this relates directly to the energy figure. Latest quarterly energy figures were not received from some IPP's. To be corrected next reporting period.

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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 requires the development of 10 000 MW additional electricity capacity to be established by 2019 against the 2010 baseline of 44 000 MW¹.

The Integrated Resource Plan (IRP) 2010² developed the 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 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 IPPs

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 and nature of energy production, assisting in the introduction of new skills and in new investment into the industry, and enabling the benchmarking of performance and pricing.

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 policy adjusted IRP 2016 will provide new procurement targets for the IPPPP Programme 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 IPPPP Office for the specific purpose of delivering on the IPP procurement 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 IPPPP and establish the IPPPP Office. A new MoA was agreed by all parties in May 2016 for a further 3-year period.

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.

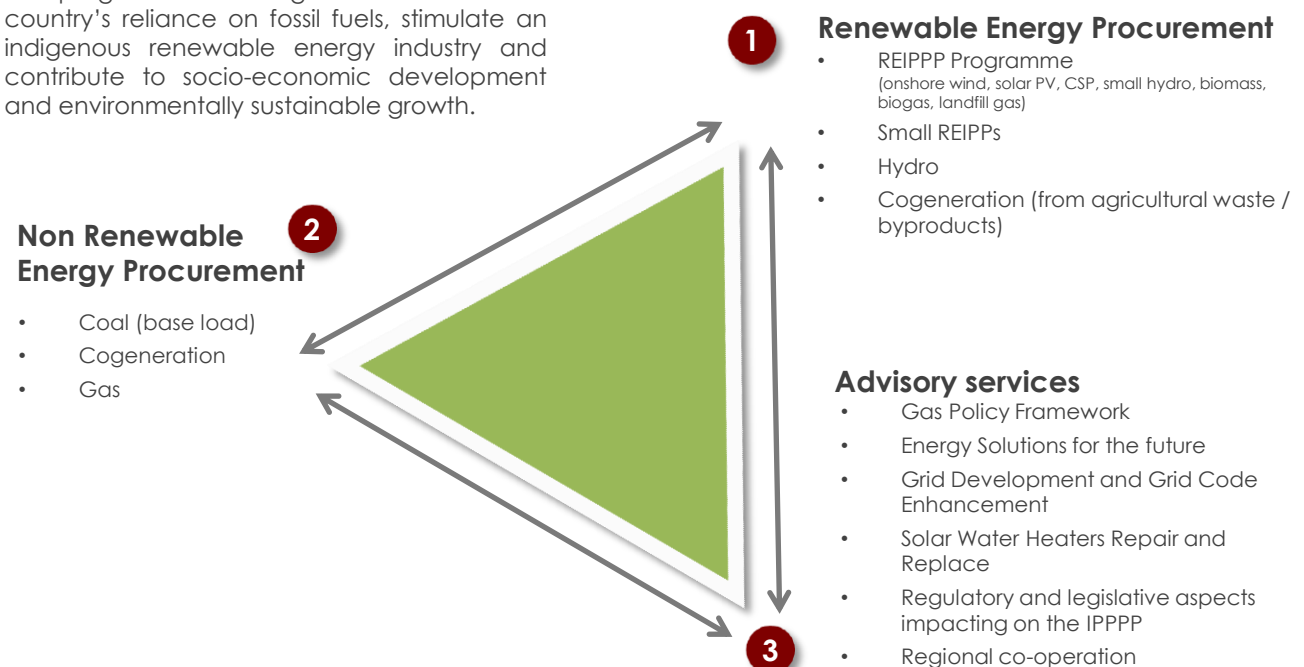
The IPPPP has been designed not only to procure energy, but has also been structured to contribute to the broader national development objectives of job creation, social upliftment and broadening of economic ownership.

The scale and scope of electricity infrastructure development under the IPPPP 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.

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 IPPPP Office provides the following services:

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



The IPPPP has been commended¹ for effectively avoiding the quicksand of laborious administrative arrangements, without undermining the quality or transparency of the programme.

The IPPPP 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 IPPPP 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.

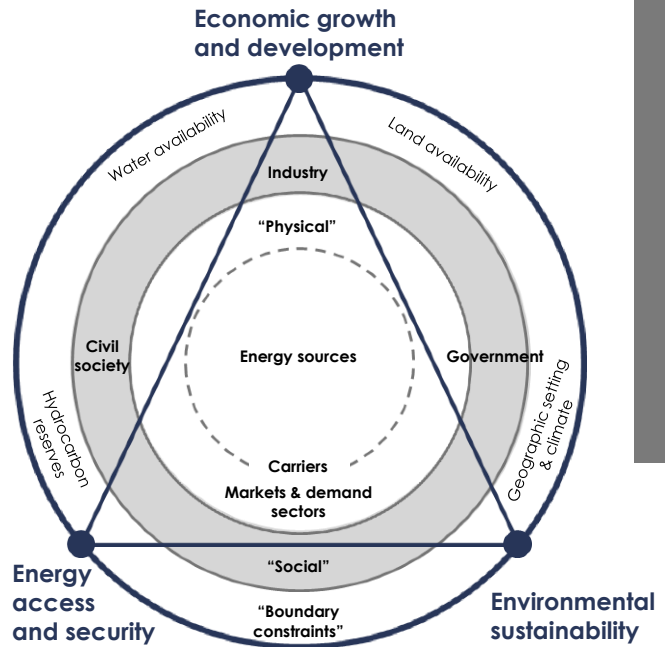
The IPPPP activities continue to evolve in order to effectively respond to the planning and development needs in the current energy context. As an example, the IPPPP Office is coordinating the development of the gas policy and strategy framework to provide broader context for the procurement of the required gas capacity as per the IRP 2010.

Energy triangle²

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.



Renewable energy procurement approach

Historically, feed-in tariffs (FITs) have been the most widely used international government policy instrument for procuring renewable energy (RE) capacity.

After investigating a REFIT, the South African government favoured a competitive tender approach that has proven to be exceptionally successful for attracting substantial private sector expertise and investment into grid-connected renewable energy at competitive prices.

Tenders are structured as a rolling bid-window programme that not only allows for continued market interest, but increased competitive pressure among bidders to participate and offer reduced pricing.

In achieving a competitively priced, clean energy bid programme, the IPPPP is meeting successfully the challenges of the energy triangle through the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

Note 1. South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons, May 2014, World Bank Group.

Note 2. Source: World Economic Forum – Global Energy Architecture Performance Index Report (2013).

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 table to the right) the IPP programme contributes directly and indirectly¹ 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 MW² should be from renewable energy sources, with an additional 2 000 MW³ 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 IPPPP 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.



The "Energy Supply capacity impact" section reports on the progress made in terms of generation capacity building, providing the required supply infrastructure in direct support of economic activity / growth

Outcome	Primary focus	IPP
1	Quality basic education	n/a
2	A long and healthy life for all South Africans	ID
3	All people in South Africa are and feel safe	n/a
4	Decent employment through inclusive economic growth	D
5	A skilled and capable workforce to support inclusive growth	D
6	An efficient, competitive and responsive economic infrastructure network	D
7	Vibrant, equitable, sustainable rural communities contributing towards food security for all	ID
8	Sustainable human settlements and improved quality of household life	D
9	Responsive, accountable, effective and efficient developmental Local Government system	ID
10	Protect and enhance our environmental assets and natural resource	D
11	Create a better South Africa, contribute to better and safe Africa in a better world	ID
12	An efficient, effective and development orientated public service	n/a
13	An inclusive and responsive social protection system	n/a
14	Nation building and social cohesion	D

D = Direct, ID = Indirect, n/a = Not Applicable

Outcome 6 | Impact indicators⁴

	Impact indicator	Baseline (2010)	2019 target
1	Adequate electricity generation capacity commissioned	44 000 MW (Eskom)	10 000 MW (added)
2	Electricity generation reserve margin increased	1%	19%

Baseline (2010)
44 000 MW
(Eskom)

2019 Target
10 000 MW
added to the
baseline

of which
5 000 MW
RE operational
+ additional
2 000 MW
contracted

Relevant sub outcomes

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

Baseline
1%
reserve margin

Target
19%
by 2019

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.

Refer to

Page 13

for more
detail on SIPs

Note 1. By setting compliance thresholds and directing socio-economic development (SED) contributions from IPPs. **Note 2.** Sub-outcome 2, item 26. **Note 3.** Sub-outcome 2, item 18. **Note 4.** A selection of relevant indicators only.



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 and "on the understanding that the DoE is aiming to maximise opportunity to still achieve certain economic development objectives" that includes 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 merging enterprises located in local communities; and
- **Socio-economic Development**, which attempts to address the socio-economic needs of local communities.



Progress of the REIPPPP against these parameters is reported in the "Economic, social and environmental footprint" section.

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

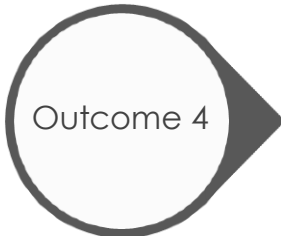
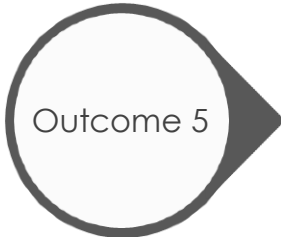
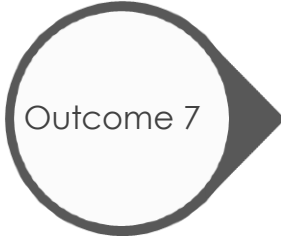
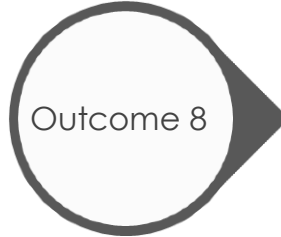
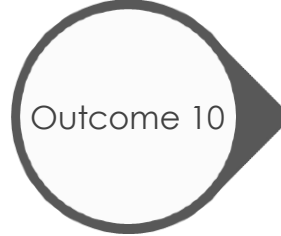
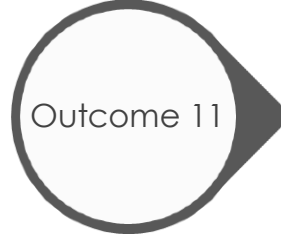
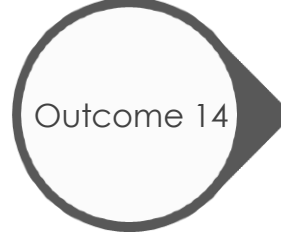
Outcome 2 – Improved health facility planning and infrastructure delivery.

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, 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	Bid category
 <p>Outcome 4</p>	<p>Outcome 4 - Decent employment through inclusive economic growth</p> <ul style="list-style-type: none"> • 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. 	<p>Job creation</p> <p>Enterprise development</p> <p>Ownership</p> <p>Preferential procurement</p> <p>Local content</p>
 <p>Outcome 5</p>	<p>Outcome 5 – A skilled and capable workforce to support inclusive growth.</p>	<p>Job creation</p> <p>Management control</p>
 <p>Outcome 7</p>	<p>Outcome 7 – Vibrant, equitable sustainable rural communities contributing towards food security for all</p> <ul style="list-style-type: none"> • Reduction of rural unemployment rate, • Increased access to quality infrastructure and services specifically education, healthcare and public transport. 	<p>Job creation</p> <p>Socio-economic development</p> <p>Ownership</p> <p>Enterprise development</p>
 <p>Outcome 8</p>	<p>Outcome 8 – Sustainable human settlements and improved quality of household life.</p>	<p>Socio-economic development</p>
 <p>Outcome 10</p>	<p>Outcome 10 – Protect and enhance our environmental assets and natural resources</p> <ul style="list-style-type: none"> • Reduced total emissions of CO₂ by 34% reduction from business as usual scenario. 	<p>Resulting from power generation from 'clean' energy sources (a consequence of Outcome 6)</p>
 <p>Outcome 11</p>	<p>Outcome 11 – Create a better South Africa, contribute to a better and safer Africa in a better world</p> <ul style="list-style-type: none"> • Increased FDI: R230 billion by 2019 (from baseline of R40 billion in 2013). 	<p>Ownership</p>
 <p>Outcome 14</p>	<p>Outcome 14 – Nation building and social cohesion</p> <ul style="list-style-type: none"> • Disability and gender equality, • Equal opportunities and redress inequality. 	<p>Preferential procurement</p> <p>Job creation</p> <p>Ownership</p>

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



Local content	Min		Target		Min		Target		As % of Project Value
4 Onshore Wind, CSP with storage, Small Hydro, Landfill Gas, Biomass, Biogas	25%	45%	25%	60%	40%	65%			
Solar Photovoltaic and CSP	35%	50%	35%	60%	45%	65%	50% ¹	70% ¹	



Key learnings incorporated

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



Ownership	Min		Target		Min		Target	
4 Shareholding by black people and/or black enterprises in the seller	12%	30%	12%	30%	12%	30%	-	40%
7 Shareholding by local communities in the seller	2.5%	5%	2.5%	5%	2.5%	5%	-	10%
11 Shareholding by black people and/or black enterprises in the construction contractor	8%	20%	8%	20%	8%	20%	-	30%
14 Shareholding by black people and/or black enterprises in the operations contractor	8%	20%	8%	20%	8%	20%	-	30%

Where BW | bid window. **Note1.** Thresholds and targets for small RE projects are not technology specific.

5
14

Bid obligation category	BW1		BW2		BW3, 3.5 & 4		BW1S2 & 2S2	
	Min	Target	Min	Target	Min	Target	Min	Target
Management control								
Black top management	-	40%	-	40%	-	40%	-	40%

4
14

Preferential procurement	Min	Target	Min	Target	Min	Target	Min	Target
	BBBEE Procurement spend	-	60%	-	60%	-	60%	-
SME and QME (QSE and EME) Procurement	-	10%	-	10%	-	10%	-	20%
Women owned vendor procurement	-	5%	-	5%	-	5%	-	10%



4
7

Enterprise development ²	Min	Target	Min	Target	Min	Target	Min	Target
	Enterprise development contributions	-	0.6%	-	0.6%	-	0.6%	-
Adjusted enterprise development contributions	-	0.6%	-	0.6%	-	0.6%	-	1%

As % of Revenue



7
8

Socio-economic development	Min	Target	Min	Target	Min	Target	Min	Target
	Socio-economic development contributions	1.0%	1.5%	1.0%	1.5%	1.0%	1.5%	-
Adjusted socio-economic development contributions	1.0%	1.5%	1.0%	1.5%	1.0%	1.5%	-	3%

As % of Revenue



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).

Item	Strategic Infrastructure Project	Engage	Report + align
1	<p>SIP 1: Unlocking the northern mineral belt with Waterberg as the catalyst Co-ordinating institution: Eskom Description: Unlock mineral resources as well as infrastructure such as rail, water pipelines, energy generation and transmission infrastructure. Urban development in Waterberg. Rail capacity to Mpumalanga and Richards Bay. Shift from road to rail in Mpumalanga. Logistics corridor to connect Mpumalanga and Gauteng.</p>	X	X
2	<p>SIP 3: South-Eastern node & corridor development Co-ordinating institution: Transnet Description: New dam at Mzimvubu with irrigation systems. N2-Wild Coast Highway which improves access into KwaZulu-Natal and national supply chains. Strengthen economic development in Port Elizabeth through a manganese rail capacity from Northern Cape; a manganese sinter (Northern Cape) and smelter (Eastern Cape). Possible Mthombo refinery (Coega) and trans shipment hub at Ngqura and port as well as rail upgrades to improve industrial capacity and performance of the automotive sector.</p>	X	
3	<p>SIP 5: Saldanha-Northern Cape development corridor Co-ordinating institution: IDC (Industrial Development Corporation) Description: Integrated rail and port expansion. Back-of-port industrial capacity (including an IDZ). Strengthening maritime support capacity for oil and gas along African West Coast. Expansion of iron ore mining production and beneficiation.</p>	X	



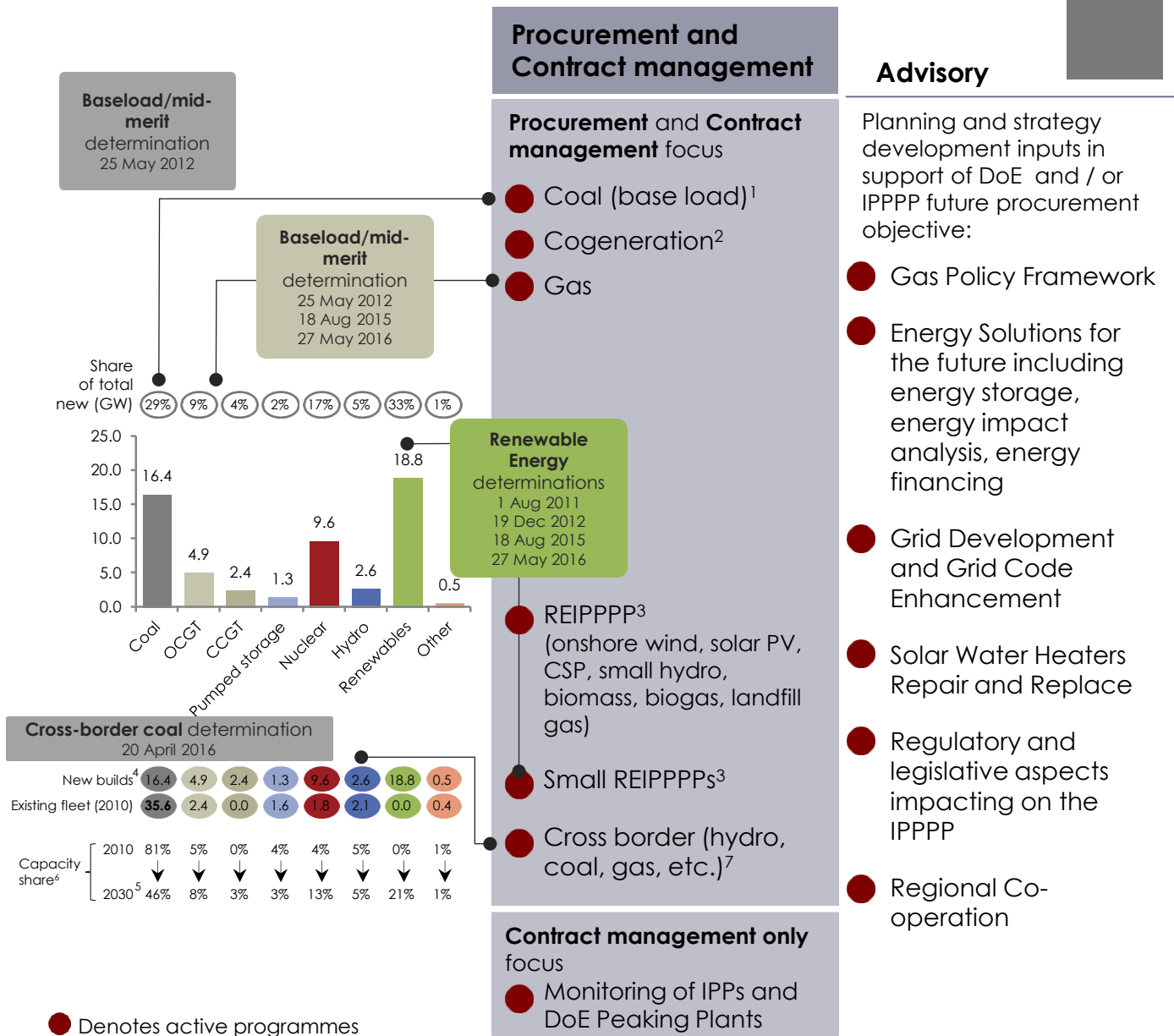
SIP target for RE
6 725 MW
By 2019

Item	Strategic Infrastructure Project	Engage	Report + align	Item	Strategic Infrastructure Project	Engage	Report + align
4	<p>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.</p>	X	X	8	<p>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%.</p>	X	
5	<p>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.</p>	X	X	9	<p>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.</p>	X	
6	<p>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.</p>	X	X	<p>The DoE is conducting the monitoring and progress with regard to the implementation of the IPPP projects through its IPPPP Office. The DoE retains the responsibility to report on programme achievements of SIP 8 and SIP 9 to the PICC structures.</p> <p>With respect to SIP 9, Electricity generation to support socio-economic development 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.</p>			
7	<p>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.</p>	X					

SIPs: Addressing spatial imbalances through targeted infrastructure investment, Source: Presidential Infrastructure Coordinating Commission

IPPPP Overview

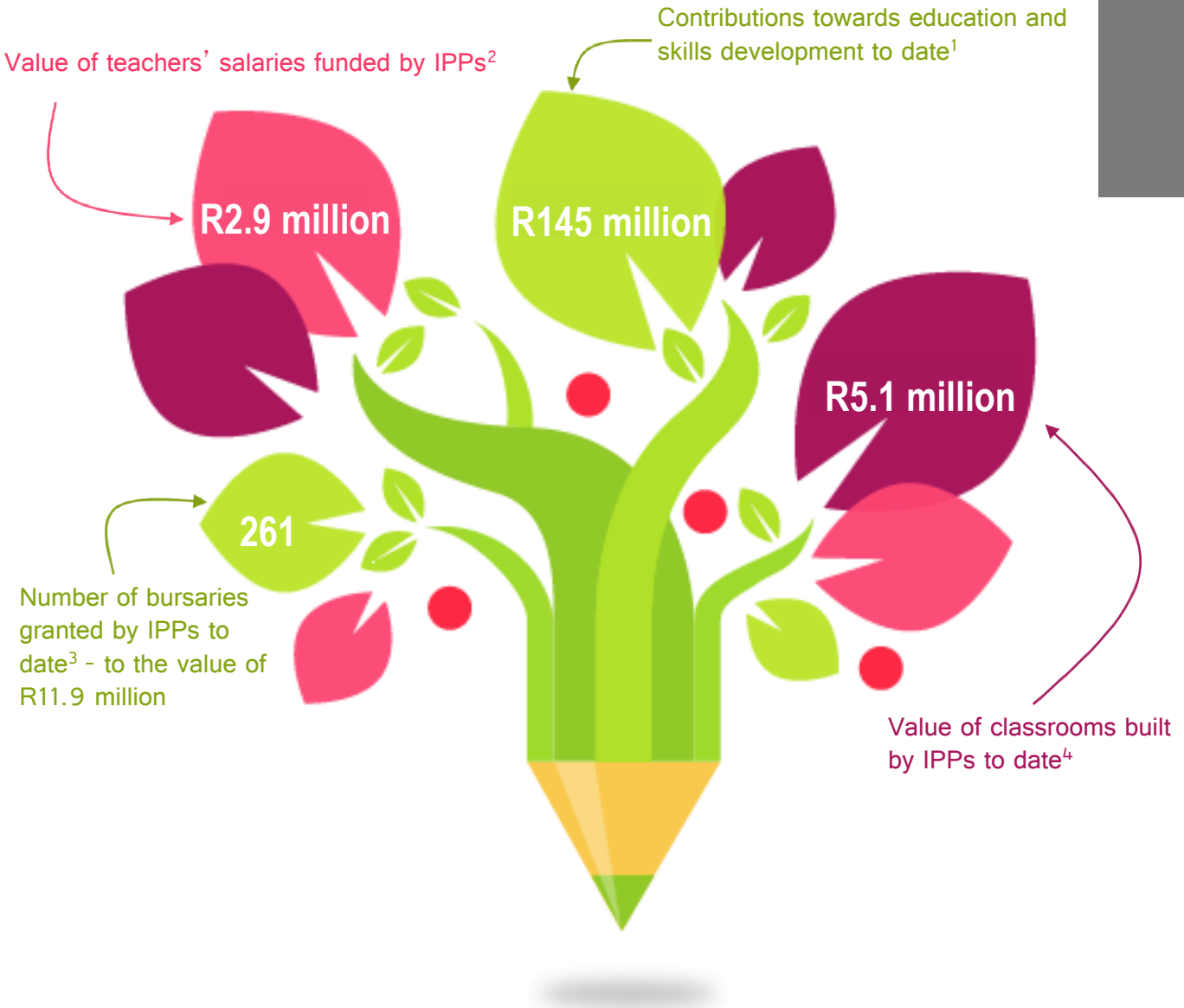
Giving effect to the IRP 2010 diversified energy mix, delivery on NDP Outcome 6 targets and IPP build mandate



Note 1. Ministerial Determination Baseload/mid-merit determination 25 May 2012. **Note 2.** Ministerial Determination for Medium Term Risk Mitigation (MTRM), 19 December 2012. Ministerial Determination for cogeneration 18 August 2015, Ministerial Determination for additional gas-fired new generation capacity 27 May 2016. **Note 3.** Ministerial Determinations for renewable energy, 1 August 2011, 19 December 2012, 18 August 2015 and 27 May 2016. **Note 4.** New builds includes all. **Note 5.** 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). **Note 6.** Share of total installed capacity (MW). **Note 7.** Ministerial Determination for cross-border coal 20 April 2016.

REIPPPP highlights

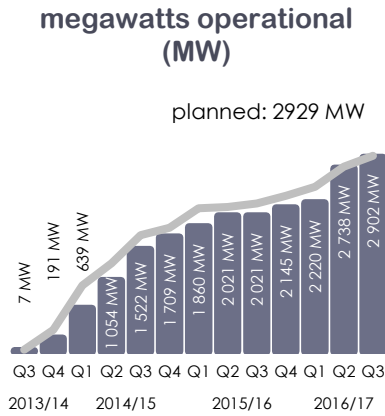
Investing in education to grow a sustainable country



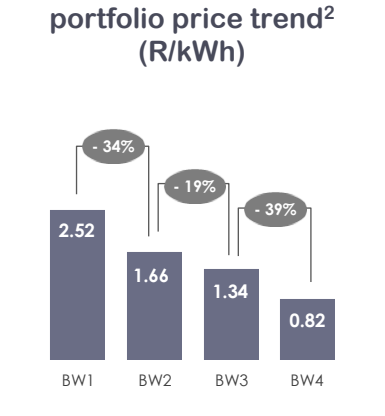
**“Education is the most powerful weapon we can use to change the world.”
– Nelson Mandela**

Note 1. As at end December 2016. **Note2.** Only salaries for core teaching staff, no extra mural or extra classes included. **Note3.** Number of tertiary / basic education bursaries; based on information provided; not all initiatives stated the number of beneficiaries. **Note 4.** Only building of classrooms, no renovations included.

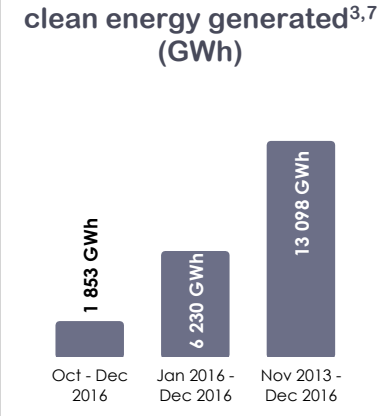
The REIPPPP is successfully delivering clean energy timeously and cost effectively



REIPPs have consistently contributed new capacity to the network since the end of 2013. At December 2016, **100%** of IPPs scheduled¹ to be operational have started commercial operations. The average lead time for these 54 projects to complete has been 1.8 years.

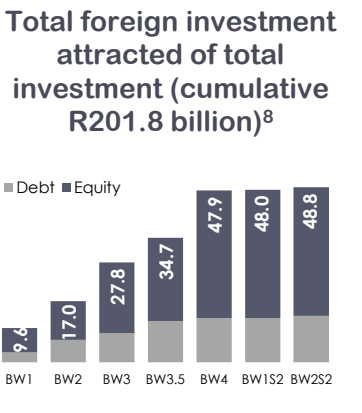


The REIPPPP is procuring energy at increasingly cost competitive rates. Prices stated in April 2016 terms. Energy weighted average (R/kWh) considering average technology RFP submission price (published) per BW and projected, annual energy contribution per technology type.

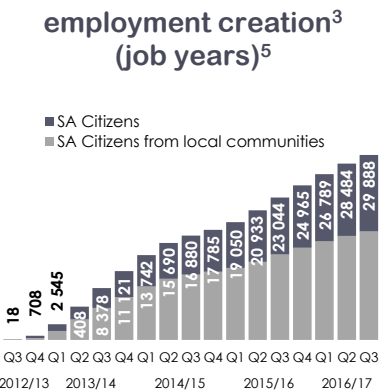


Although production is only ramping up as IPPs become operational, **13 098 GWh⁷** have already been generated by the RE portfolio since inception to date - thereby offsetting **13.3 Mton CO₂ emissions^{4,7}**.

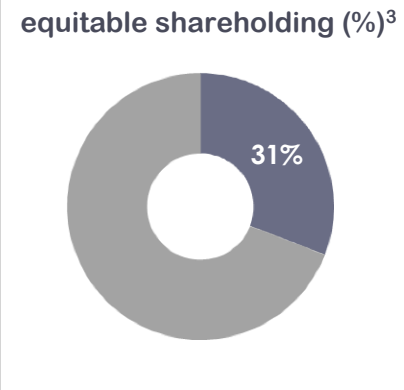
...and is supporting broader development objectives



The total foreign equity and financing invested in REIPPs (BW1 - BW4, 1S2 & 2S2) reached R48.8 billion. This is more than double the total FDI attracted into South Africa during 2015 (R22.6 billion)⁶.



Employment for South African citizens including people from communities local to the IPP operations.



For projects that have reached financial close, Black South Africans hold 31% of the shares across the complete supply chain and Local communities hold 11% equity in the IPPs.

Note 1. 54 IPPs have reached commercial operation date (COD) out of 54 that were planned by December 2016. **Note 2.** 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) (in April 2016 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 and 1 of 2 BW3.5 projects. Projects which have not completed financial close - 1 BW3 project, 1 BW3.5 project, BW4, BW1S2 & BW2S2. **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.** South African Reserve Bank (SARB). 2016. Quarterly Bulletin March 2016:40. Pretoria: SARB. **Note 7.** Energy (and carbon emissions) figure understated. Latest quarterly figures not received from some IPPs. To be corrected next reporting period. **Note 8.** BW3 & BW3.5 have been updated from Bid Submission figures to figures as at Financial Close.



The REIPPPP contribution:

Energy supply
capacity impact

NDP, Outcome 6

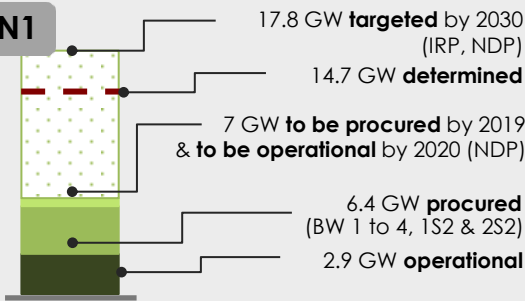
The procured portfolio of RE capacity

REIPPPP Capacity

Targets versus capacity procured



N1



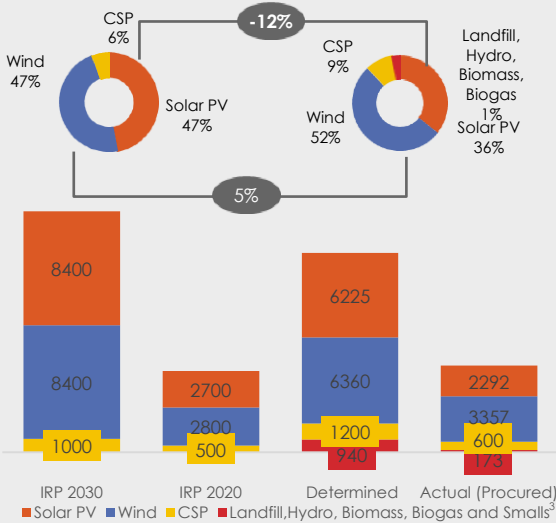
41 percent



of the 2020 target for RE is already operational (Dec 2016)

Electricity mix

Share of available capacity (GW)³



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, BW1S2¹ and BW2S2¹. Of this, 4.0 GW (from BW1, BW2, BW3² and BW3.5²) are at various stages of construction or have commenced with commercial operation.

By end December 2016, 2.9 GW (2 929 MW) of the procured capacity started operations and delivering 2.9 GW (2 902 MW) of actual capacity (i.e. 54 IPPs delivering 27 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 16% towards the 2030 target and 41% 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.

Energy



Capacity



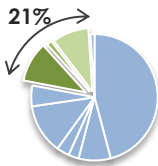
N1

Refer to

Appendix A

(interpretation notes for a complete breakdown of targets)

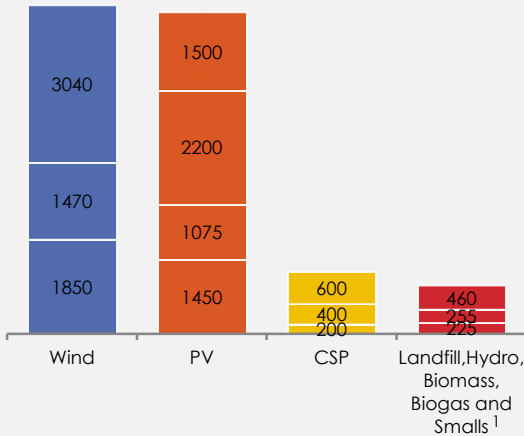
IRP 2010 plan: RE (new build, excluding hydro) **21%** of total capacity by 2030



Note 1. 1S2 & 2S2 refers to the completed bid cycles for small RE projects consisting of two bid rounds. **Note 2.** 16 of 17 BW3 and 1 of 2 BW3.5 projects have reached financial close and started construction. **Note 3.** The 940 MW allocation for landfill gas, hydro, biomass and biogas includes small projects of 400 MW. The 173 MW Actual (Procured) for landfill gas, hydro, biomass and biogas includes small projects of 99MW.

Technology capacity allocation¹

Capacity (MW)



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 in the first five years. 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)

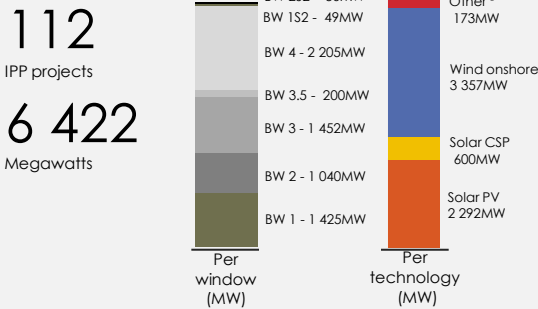
In line with international experience, the price of renewable energy is increasingly cost competitive with conventional power sources. The REIPPPP has effectively captured this global downward trend with prices decreasing in every bid window.

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 LCOEs² for Medupi and Kusile in 2012 quoted R0.54 and R0.73/kWh respectively (R0.67 and R0.91/kWh in April 2016 terms). Cost over-runs, increases in financing and (expected) increases in operational (including coal) costs prompted industry to challenge the validity³ of Eskom's cost projections. Industry counter estimates at the time for the LCOE of Medupi were R0.97/kWh (R1.21 in April 2016 terms). Considering the ongoing delays in completion, indications are that these costs may even be significantly higher.

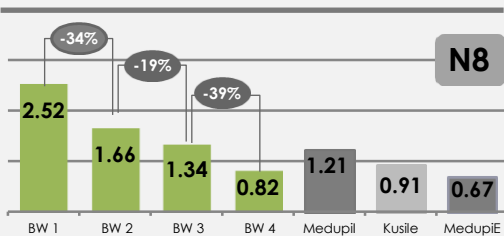
Capacity breakdown (procured)

Capacity (MW)



REIPPPP estimated⁴ price trends

Energy weighted average (R/kWh)



Note: REIPPPP prices expressed in April 2016 terms

Note 1. The MW allocation for landfill gas, hydropower, biomass and biogas includes small projects of 400 MW. **Note 2.** Levelised Cost Of Electricity (figure shows April 2016 terms for comparison purposes). **Note 3.** MAC Consulting report (extract presented by Eskom), EIUG analysis on a levelised cost scenario of Eskom's New Build programme, NERSA media statements (2012). **Latest industry estimates are about R1.05/kWh (SAWEA), i.e. R1.31/kWh in April 2016 terms.** **Note 4.** Contracted (at which power is sold to Eskom) price (in 2016 terms) per IPP was weighted with consideration of the technologies and their relative, projected annual energy contribution (P50). BW3 estimated rate incorporates the peak tariff (270% of base rate) applicable to CSP (refer interpretation notes for additional detail). **Note 5.** 173 MW for Other technologies includes 99 MW for Smalls.

44%

of the determined capacity procured

Refer

Page 21

for detail of the price trends per technology

Refer note

N8

for detail of the portfolio average estimate

where: Medupi I - industry estimate

Medupi E - Eskom figure

Average technology tariffs³

R/kWh



Average

0.98

2.58

1.87

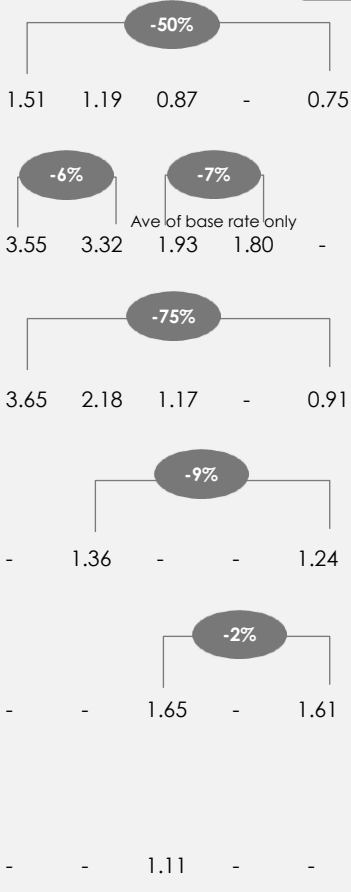
1.34

2.02

1.11

Per bid window

N8



In comparison, the **estimated**, average portfolio¹ cost for all technologies under the REIPPPP has dropped consistently in every bid period to a combined average¹ of R0.82/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 R0.75/kWh, with the BW4 price directly comparable² with the per kWh price of new coal generation.

Solar PV has dropped most significantly with a price decrease of 75% to R0.91/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 6% to R3.32/kWh between BW1 and BW2 and by 7% to R1.80/kWh from BW3 to BW3.5 (average base rate)⁴.

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 R1.39/kWh. 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 BW1S2). More recently the second small scale renewable bid window has been procured at an average price of R1.01/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.

Average technology tariffs³

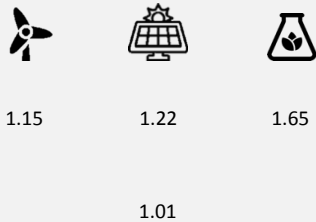
R/kWh for small RE projects



1.39

1.01

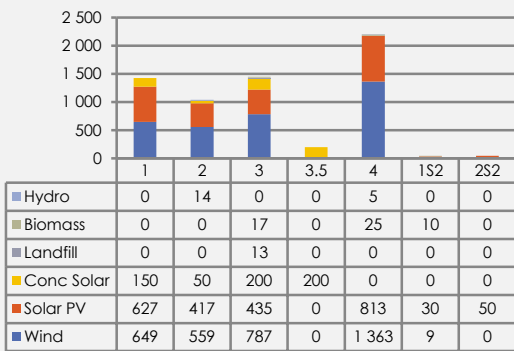
Per technology



Prices contracted under the REIPPPP for all technologies are well below the published REFIT prices. The REIPPPP has effectively translated policy and planning to deliver 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.

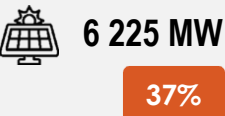
Note 1. Contracted price (at which power is sold to Eskom) per IPP was weighted with consideration of the technologies and their relative, projected annual energy contribution (P50). **Note 2.** Without considering the technical differences in availability and load factors. **Note 3.** Fully indexed price, inflation adjusted (2016). **Note 4.** The peaking rate is 270% of the base rate (i.e. an average of R5.04/kWh for BW3 and 3.5).

Technology capacity procured Per technology per bid window (MW)

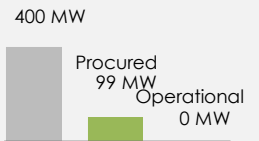
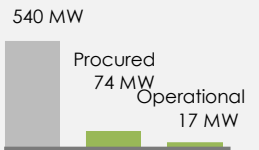
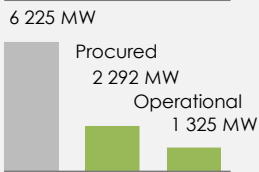
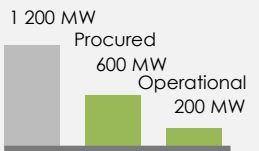
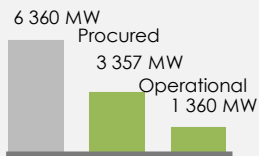


Procured vs determined Capacity Per technology (MW)

Determined



Procured



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 BW1S2, 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 BW2S2.

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. These additional determinations continue to provide bidders and investors with a line of sight on future prospects which is important to maintain 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.

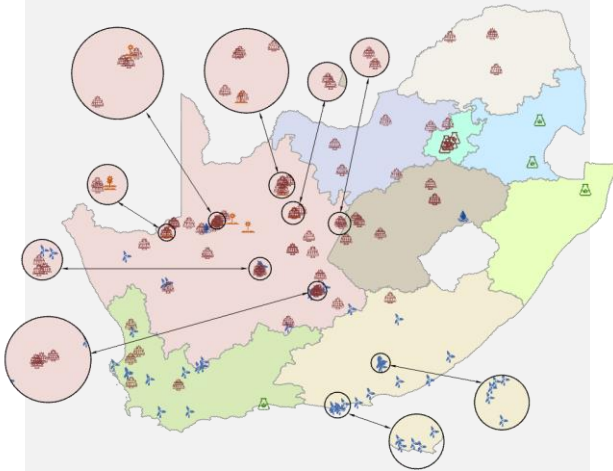
To date, 44% (i.e. 6 422 MW) of the total targeted RE capacity of 14 725 MW (including 400 MW for Smalls projects) has been procured. More than half of the wind power has been procured to date (3 357 MW or 53% of the 6 360 MW determined capacity for wind). For CSP 50% or 600 MW of the determined capacity 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 BW1S2 and a further 50MW under BW2S2. This combined 99MW represents 25% of the allocated capacity for smalls. The 99 MW include 80 MW from solar PV, 9 MW from wind power and 10 MW from biomass.

Project Distribution

Number of projects

	OW		PV
	BM		LG
	CS		SH



Key learnings identified

Closer collaboration/improved alignment with provincial energy strategies, spatial planning and development plans are important to optimise the benefits of the REIPPPP to provinces.

Forums are being created to facilitate improved interaction and alignment

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, BW1S2 and BW2S2) 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.

Refer

Page 65

for detailed provincial distribution information

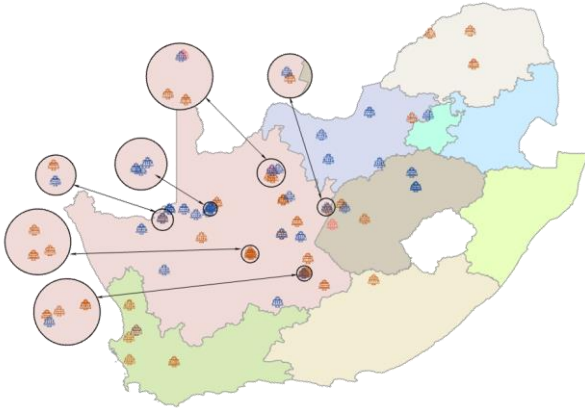
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Page A6

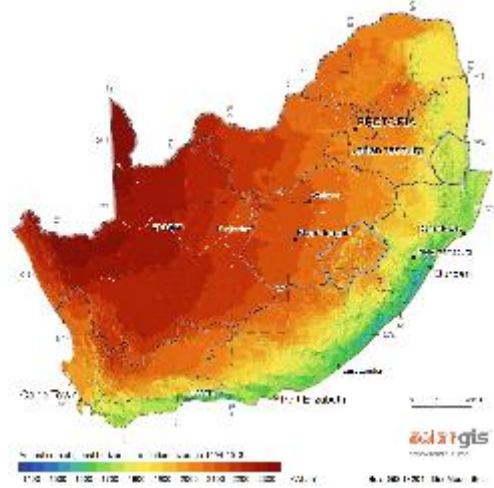
for details on technology capacity factors

Technology distribution

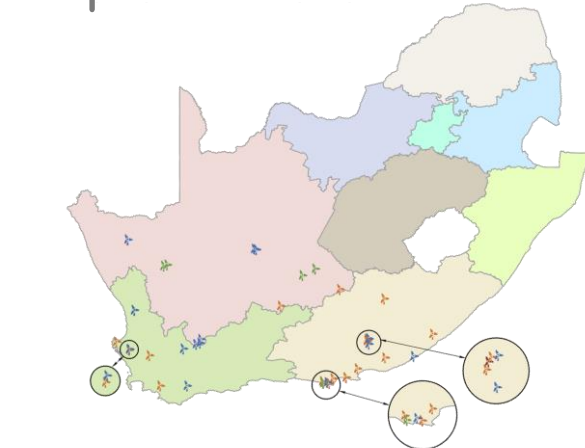
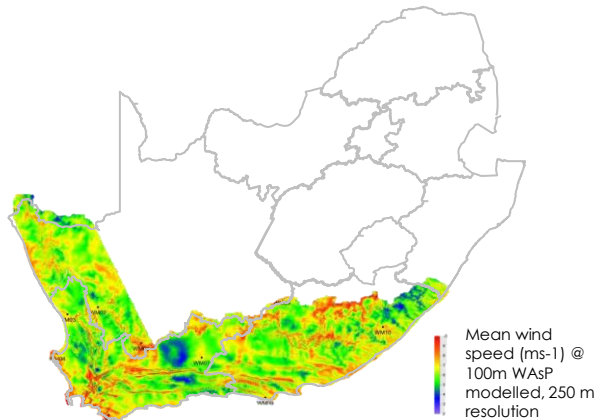
The geographical distribution of projects is largely based on favourable resource conditions, in particular solar radiation and wind flows throughout the year, as illustrated below.



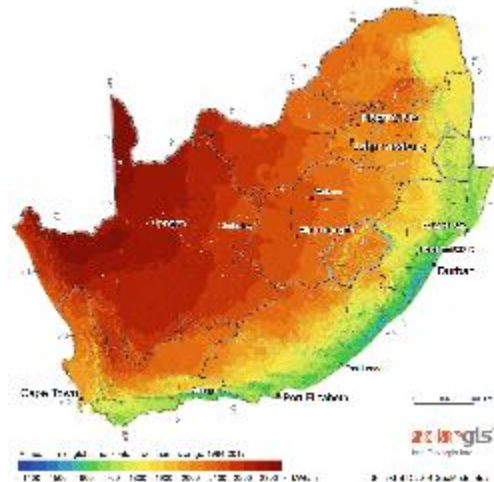
Solar maps for South Africa, Lesotho and Swaziland, GeoModel Solar¹



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



Solar maps for South Africa, Lesotho and Swaziland, GeoModel Solar¹



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 December 2016)

The status of the combined portfolio of the 112 IPP projects procured in BW1 - BW4, BW1S2¹ and BW2S2¹ is:

- There are 64 active² projects of which **54 projects are in operation** and have added **2 902 MW generation capacity** to the national grid. This includes **3 projects with 165 MW of generation capacity** which reached their **commercial operation date (COD)** in the reporting quarter. Since the first plant became operational **13 098 GWh³ of renewable energy has been generated**. There are 2 projects in EOP but they are yet to generate energy.
- All **28 projects** in BW1 AND **19 projects** in BW2 have **reached COD**.
- Of the **17 projects** from BW3, **7 have reached COD** and have a total generation capacity of **454 MW**. Of these, **3 projects reached COD** in the reporting quarter. There are also **2 projects** that both moved into EOP in the reporting quarter leaving only **7 projects in construction**. **One project** is still awaiting **financial close**.
- Of the **2 projects** in **BW3.5**, **1 is in construction** while **1 is still awaiting financial close**.
- The **BW4 (26 projects)** and **Smalls projects - BW1S2 (10 projects)** and **2S2 (10 projects)** are currently **concluding their financial close phase** before they will commence with construction.

Energy



Capacity

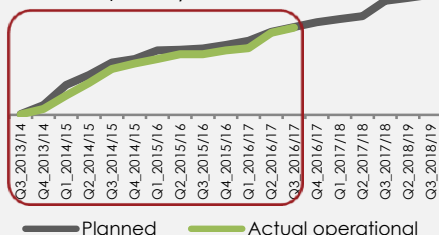


REIPPPP operational capacity

Capacity (MW)



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



Operational capacity



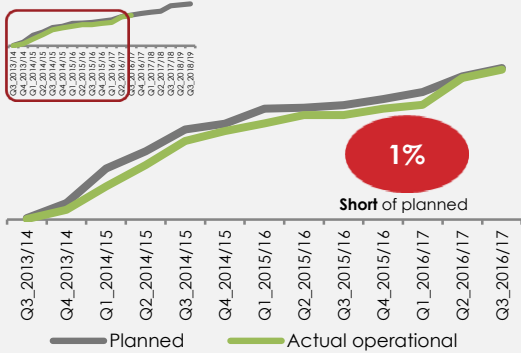
For the 64 active² projects, 54 have successfully completed construction. The average construction lead time for this current portfolio of projects has been 699 days (~1.9 years).

Based on scheduled commissioning dates and progress to date, it is projected all active² projects in BW1 to BW3.5 (64 projects) will be operational by 30 November 2018.

2 929 MW (from 54 projects) was scheduled to be operational by end of December 2016, with 2 902 MW realised (from 54 projects). 99% of the scheduled capacity has been achieved, with a 27 MW shortfall from the capacity expected by the end of this period. A landfill project⁴ where only 1 of its 5 sites have reached COD is contributing 10 MW to the shortfall.

Note 1. 1S2 and 2S2 refers to the completed bid cycles for small RE projects that consisted of two bid rounds. **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 1 site (3 MW) is in operation resulting in a 10 MW shortfall. As the other sites reach COD this 10 MW shortfall will decrease.

REIPPPP operational capacity



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 December 2016, all 54 projects (100%) scheduled to be operational had all reached COD. The few IPPs in operations delivering below their contracted capacity are resulting in a shortfall of **27 MW**.

The average time delay between actual and scheduled COD for IPPs **in operation** was 74 days i.e. ~2.4 months. BW1 projects were mostly responsible for the delay followed by BW2 projects which were, on average, 89 and 74 days delayed respectively. The average time delay between the actual and scheduled COD for the 7 BW3 projects that are operational was only 16 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 10 IPPs still either in construction or EOP. At the end of the reporting quarter these projects were all tracking to reach COD on their schedule date without delays. All 28 BW1 projects have reached COD, as have all 19 BW2 projects.

There are 17 projects in BW3 of which 1 is still awaiting financial close. There are 7 projects that have reached COD, 3 in the current reporting period. For the 9 remaining projects, 2 recently moved into EOP with 7 still in construction. All BW3 projects should be completed by 30 November 2018 as originally scheduled. The one BW3.5 project that is in construction will reach COD in September 2018 as scheduled.

In the next quarter 2 projects, both from BW 3, with a planned capacity of 150 MW are scheduled to start commercial operations.

Operational capacity (2 902 MW) is contributed by Solar PV (1 325 MW), Onshore Wind (1 360 MW), CSP (200 MW), Hydro (14 MW) and Landfill (3 MW) technology.

Delivery risks (significant risk)

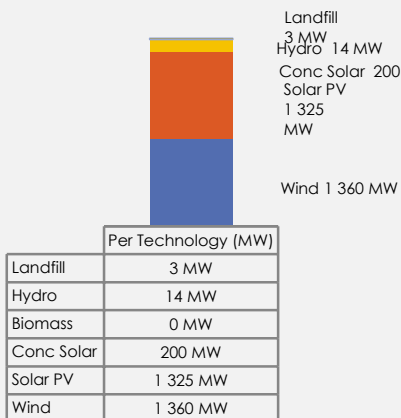


Deemed energy payments. IPPs that have completed construction, but was prevented from connecting to the grid due to network unavailability is paid for **deemed** energy. Deemed energy payments to date is R325 million. Engagement with Eskom's Grid Access Unit remains ongoing.

Monitoring of delays. Delays are monitored and, where possible, the resolution of cross cutting implementation issues (such as grid connection delays) facilitated or escalated as appropriate.

Operational capacity

Per technology (MW)

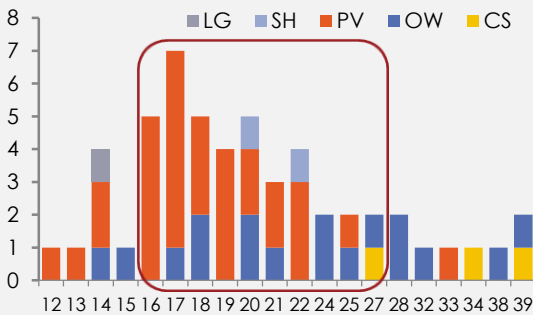


Average delivery lead time

Years

1.8
years

average **lead time** for delivering 2 902 MW operational capacity



Construction duration

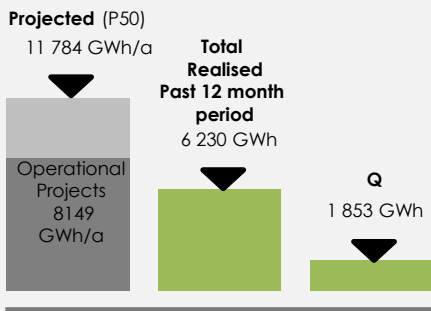
As indicated previously, despite delays, the average construction lead time for the current portfolio is 651 days i.e. 2 902 MW generation capacity was delivered within 1.8 years.

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 (39 of 54) took between 16 and 27 months to be constructed. The cluster of projects that completed in the 16 – 27 month timeframe, delivered 2 294 MW, representing 79% of the 2 902 MW operational capacity. To date, no projects were completed in less than 12 months. The graph to the left shows that CSP projects take longer to construct with the shortest lead time being 27 months. As expected, this confirms that significant renewable capacity can be brought online within a short timeframe.

Energy supplied to grid

Energy generated (GWh)³



Energy supplied

The first IPP reached COD, supplying power to the grid, in November 2013. Since inception², 13 098 GWh³ of energy has been generated by renewable energy sources from the 54 projects that are operational. Of this energy, 1 853³ GWh was generated during the reporting quarter, which is slightly more (11%) than the 1 642 GWh generated in the previous quarter. The slight increase is due to the increased daylight hours in the early summer months.

Of the 54 projects that have reached COD the energy generated over these last 12 months (January 2016 to December 2016) from limited operations was 6 230 GWh³

Percentage of energy generated

Percentage

76
percent

of the projected (P50¹) annual generation achieved from the 54 operational plants

- This 6 230 GWh³ represents **76%** of the annual projected energy production by all the operational IPPs (P50¹ for the 54 operational IPPs is 8 149GWh).
- The average operational period of the current portfolio of the 54 IPPs is 673 days (approximately 22.1 months).
- All the 47 BW1 and BW2 projects are in operation and have generated 5 864 GWh³ over the last 12 months. This equates to **85%** of their combined annual projected energy production (P50¹) of 6 880 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.

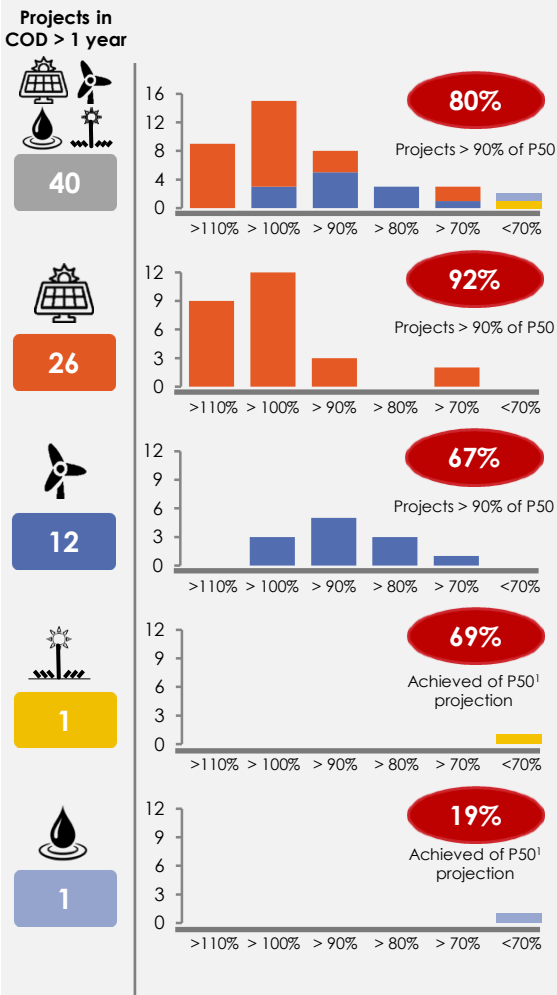
Percentage of energy generated³

Percentage

104 percent of projected (P50) annual generation achieved by solar PV plants operational for more than 12 months

Achievement of P50¹ projections

No. of projects



Of the 54 projects that have reached COD, 40 projects have been operational for longer than one year and 32 of those projects reached COD over 24 months ago. The energy generated over the past 12 month period for these 40 projects is 5 087GWh³ which is 94% of their P50¹ projections of 5 401 GWh over a 12 month delivery period.

Twenty four of the 40 projects (60%) have individually exceeded their P50¹ projections while 80% of the projects achieved greater than 90%. These are for solar PV and onshore wind projects.

- **Solar PV** – The majority of operational IPPs are solar PV plants with lower energy yields in the shorter daylight winter months. 26 projects with this technology have been operational for more than 1 year and these plants generated 2 169 GWh³ over the past 12 month period exceeding their P50¹ projections of 2 083 GWh by 4%. Individually, 21 of these 26 PV projects (81%) have exceeded their P50¹ projections while 92% of the IPPs achieved greater than 90% of their P50¹ projection. Two projects fall short of achieving greater than 90% of their P50¹ projection and 9 projects have exceeded 110% of their target. Based on the results achieved to date, it is fair to assume that energy projections for PV plants are being achieved.

Onshore wind – 12 projects using onshore wind technology have been operational for more than 1 year and these IPPs have generated 2 681 GWh³ over the past 12 month period which falls short of their total P50¹ projections of 2 922 GWh by 8%. Individually, 3 of these 12 wind projects (25%) have exceeded their P50¹ projections while 67% of the IPPs achieved greater than 90% of their P50¹ projection. Four projects fall short of achieving greater than 90% of their P50¹ projection.

CSP and Small Hydro – Of the 3 CSP projects that have reached COD only 1 has been in operations for more than 12 months. This project generated 223 GWh³ (69%) against a P50¹ projection of 324 GWh over the past 12 month period. Likewise with Small Hydro, only 1 of the 2 completed projects have been in operational for more than 12 months and it is only achieving 19% of it's P50¹ projection.

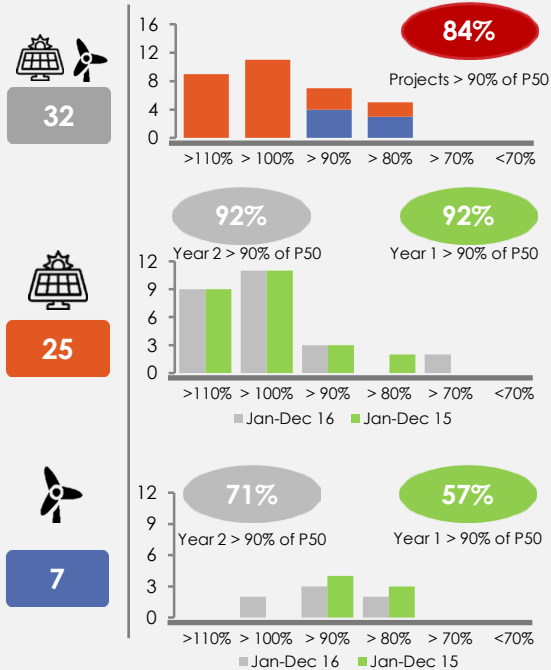
Note 1. Refer to explanatory notes at end of this report for the definition. **Note 2.** Total renewable energy generated by the IPPs since the first project became operational. **Note 3.** Energy figure understated. Latest quarterly figures not received from some IPP's. To be corrected next reporting period.

Achievement of P50¹ projections

No. of projects



Projects in
COD > 2 years



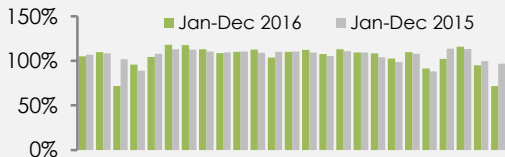
Of the 40 projects that have reached COD, 32 projects have been operational for longer than 24 months. This has only being for Solar PV and Onshore wind projects. When comparing the 32 projects over the two by 12 month periods the following was noted:

- For Year 1 (January - December 2015) 3 706 GWh³ (99%) of the 3 764 GWh P50¹ projection was achieved. For Year 2 (January - December 2016) 3 741 GWh³ (99%) were achieved against the same P50¹. The 23 GWh³ difference is insignificant and the 99% achievement against projection retained.
- For the 32 projects, individually 27 IPPs (84%) achieved greater than 90% of their P50¹ projection.

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.

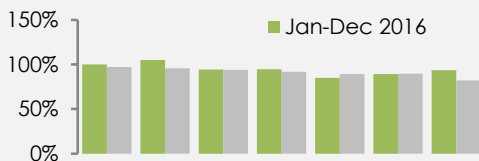
Achievement of P50¹ projections

Percentage per project



Achievement of P50¹ projections

Percentage per project



- Solar PV** – Of the 32 projects that have been operational for more than a two year period, 25 are Solar PV technology. For the time periods, Year 1 and Year 2, these 25 projects generated 2 180 GWh³ (105%) and 2 158 GWh³ (104%) respectively against their targeted P50¹ projection of 2 073 GWh. Individually 20 projects have exceeded their P50¹ projections in each year. When comparing the energy generation achieved year on year per project, there has been little variation. 5 of the 25 projects showed greater than a 5% difference (increase or decrease year on year). This can be seen graphically on the left hand side
- Onshore wind** – Of the 32 projects that have been operational for more than a two year period, 7 are Onshore wind technology. For the time periods, Year 1 and Year 2, these 7 projects generated 1 526 GWh³ (90%) and 1 582 GWh³ (94%) respectively against their targeted P50¹ projection of 1 688 GWh. In Year 1 no individual project achieved their P50¹ projections however 2 IPPs achieved this in in Year 2.

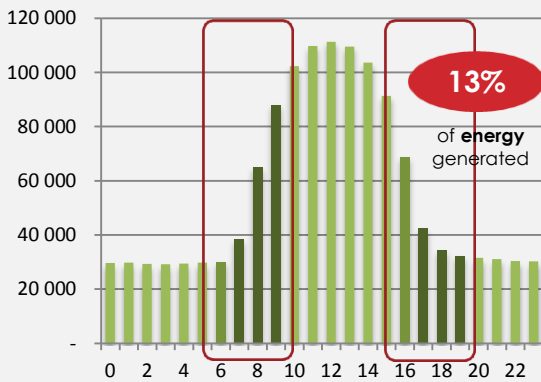
Note: Generation data has not been received from Eskom since August 2016. It was therefore recommended that a standard template of generation data information exchange be created. The IPPs will be requested to populate and return it to the IPPPP Office on a monthly basis in order to perform more current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

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.

Hourly energy profile



Q1_2016/17⁵ energy generated (GWh)



Reserve margin¹ contribution

The NDP targets an improvement in the reserve margin during the MTSF² 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)⁵ a 13% contribution was made during the morning and evening system **peak periods**³ (15% since inception up to June 2016)⁵.

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

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 IPP's. To be corrected next reporting period. **Note 5.** Hourly profile reported as for March 2016 to June 2016 quarter as updated figures 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

Committed investments

Bid window 1 to 4, 1S2 & 2S2 (R billion)⁴



201.8

Rand billion

Committed (**total project costs¹**) for IPP development in BW 1 to 4, 1S2 & 2S2

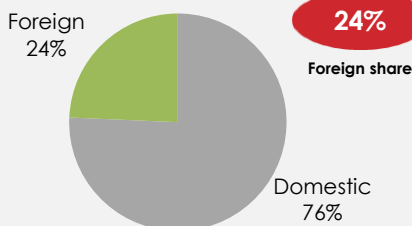
of which

R48.8 billion

from foreign investors and financiers⁴

Foreign equity and financing share

Bid window 1 to 4, 1S2 & 2S2 (percentage)⁴



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 R201.8 billion (this includes total debt and equity of R200.4 billion, as well as early revenue and VAT facility of R1.4 billion).

An analysis of the funding sources² and shareholding highlights how broad the participation and benefits are that result from this investment.

The REIPPPP has attracted R48.8 billion in foreign investment and financing in the seven bid windows (BW1 – BW4, 1S2 and 2S2), more than double the inward FDI attracted into South Africa during 2015 (R22.6 billion)³.

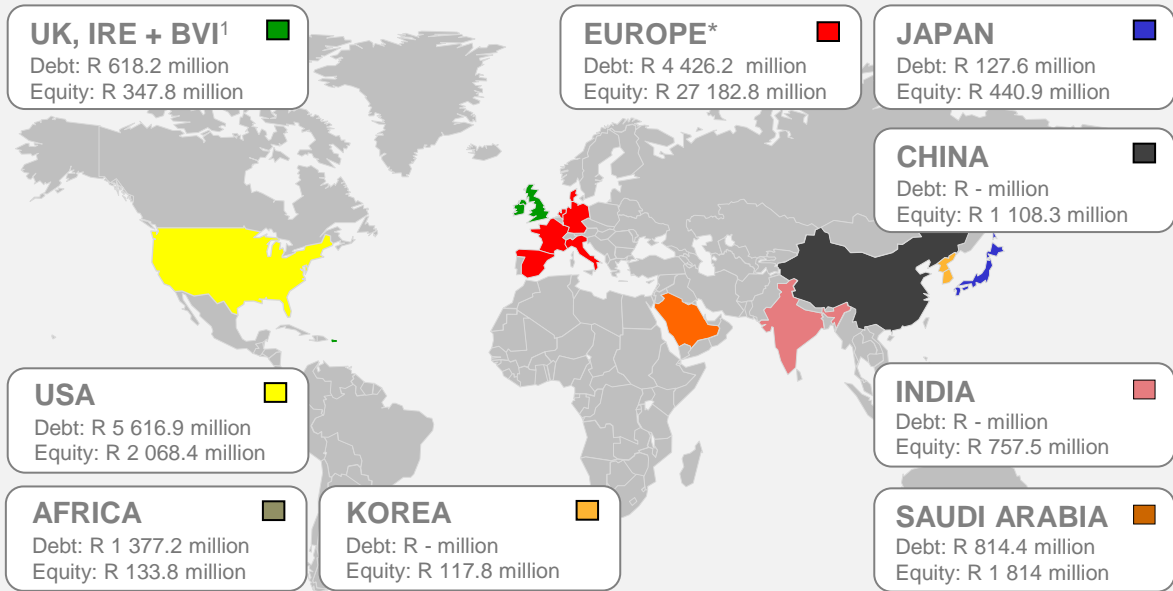
Whilst retaining shareholding for South Africans is a priority, the associated influx of foreign investment and funding is also of significance to the economy. The NDP (Outcome 11) set a target of a R230 billion increase in FDI (facilitated by the dti) by 2019.

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.

Note 1. Total Project Costs: Total capital expenditure to be incurred up to the COD by the Seller in the design, construction, development, installation and/or commissioning of the project (inclusive of VAT and revenue). **Note 2.** This analysis is based on Financial Close for BW1, BW2, BW3 and BW3.5 and RFP for BW4, 1S2 and 2S2. Note this may result in minor discrepancies with reported numbers elsewhere in the report.

Note 3. South African Reserve Bank (SARB). 2016. Quarterly Bulletin March 2016:40. Pretoria: SARB. **Note 4.** BW3 & BW3.5 have been updated from Bid Submission figures to figures as at Financial Close (foreign investment decreased at Financial Close).

Sources of foreign equity and debt

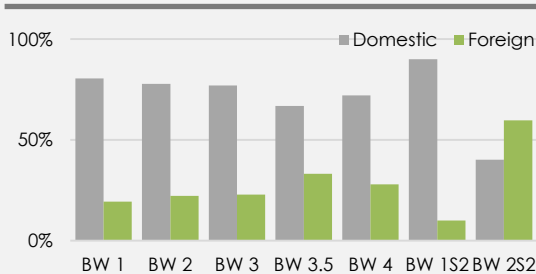


* European countries of origin

Germany | Debt: R 1 854.2 million | Equity: R 1 113 million **France** | Debt: R 1 250 million | Equity: R 2 547.8 million
Italy | Debt: n/a | Equity: R 13 934.5 million **Luxembourg** | Debt: R 560 million | Equity: R 892.1 million
Netherlands | Debt: R 762 million | Equity: R 2 769.6 million **Norway** | Debt: n/a | Equity: R 1 107.7 million
Spain | Debt: n/a | Equity: R 4 818 million
 [Approximately R1 876.8 million foreign equity not attributable to a single country of origin i.e. not shown]

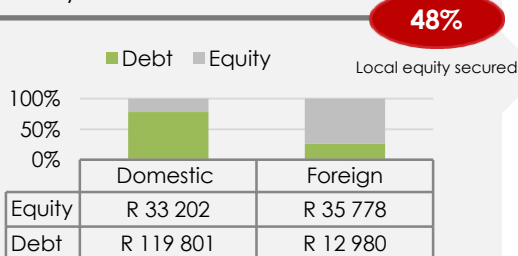
Investment share per bid window

Bid 1 to 4, 1S2 & 2S2 (percentage)³



Debt equity share of total project cost

(R million)³



The FDI analysis identified at least 18 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 continues to garner investor confidence.

South African citizen shareholding

The importance of retaining shareholding in IPPs for South Africans was recognised and incorporated into the procurement conditions², requiring that at least 40% of each project should be owned by South African entities with level 5 contributor status.

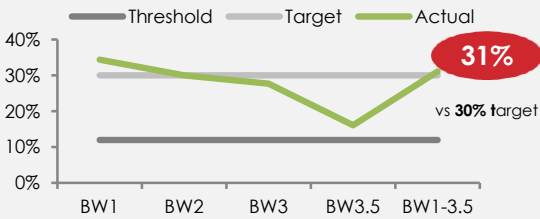
The South African (local) equity shareholding across BW1 to BW4, BW1S2 and BW2S2 equates to 48% (R33.2 billion) of total equity (R69.0 billion), which is substantially more than the 40% requirement. Foreign equity amounts to R35.8 billion and contributes 52% of total equity.

Note 1. UK, Ireland and British Virgin Island. **Note 2.** 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. **Note 3.** BW3 & BW3.5 have been updated from Bid Submission figures to figures as at Financial Close.

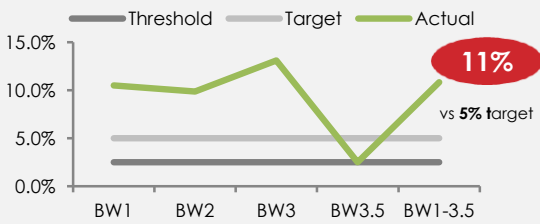
Ownership

Actual % vs target (BW 1,2,3 & 3.5)¹

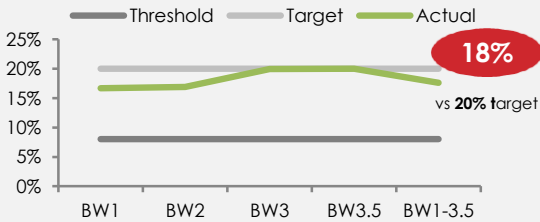
Shareholding (Black people total)



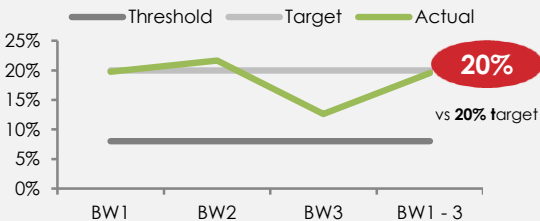
Shareholding (Black people in local communities)



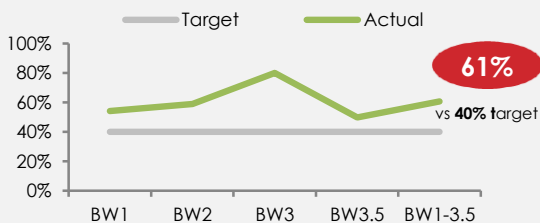
Black shareholding in EPC contractor



Black shareholding in operating company²



Black Top Management



South African debt across BW1 to BW4, 1S2 and 2S2 equates to 90.2% (or R119.8 billion, which includes total debt of R118.4 billion and early revenue and VAT facility of R1.4 billion) of total debt (R132.8 billion). Foreign debt accounts for 9.8% (R13.0) of total debt.

The REIPPPP contributes to Broad Based Black Economic Empowerment and the creation of black industrialists. Black South Africans own, on average, 31% of projects that have reached financial close (i.e. projects in BW1 – BW3.5¹), this is slightly above the 30% target.

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

The REIPPPP has ensured that black people in local communities have ownership in the IPP projects that operate in or nearby their vicinities. On average, black local communities own 11% of projects that have reached financial close. This is well above the 5% target.

In addition, an average of 18% 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 lagging slightly on the 20% target.

Furthermore, shareholding by black people in operating companies of IPPs has averaged 20% (against a targeted 20%) for the 54 projects in operation (i.e. in BW1, BW2 and BW3). The 13% average achieved for BW3 is understated as it includes the 3 projects which recently reached COD and which do not have values to report against. This will be corrected in the next reporting quarter.

The target for shareholding by black people in top management has been set at 40%, with an average 61% achieved to date.

Refer

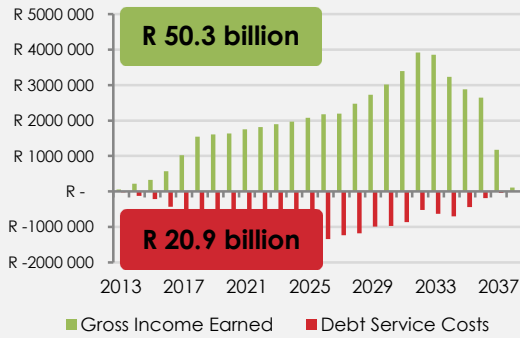
Page 11 & 12

for detail of the targets and thresholds across bid windows.

Note 1. Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3 and (1 of 2 projects) BW3.5 and projects in operation i.e. BW1, BW2 and (7 of 17 projects) BW3.

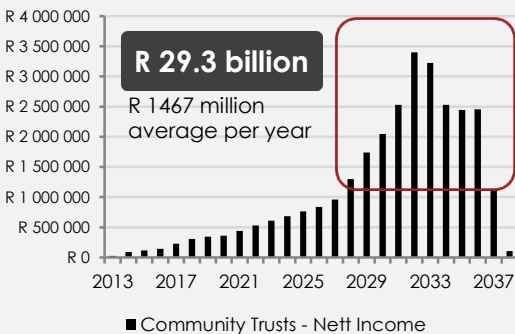
Community trusts | Income and costs^{1,2,3}

Total project, gross income and debt costs²
(Rand million)



Community trusts | Net income^{1,2,3}

(Rand million)



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.

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 R29.3 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).

N6

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 R1.47 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 the 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 for community trusts.

N3

Income to all shareholders only starts with operations. With only 54 IPPs operational over a short period of time, revenue generated has been limited to R28.4 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.

Note 1. Income and costs expressed in nominal terms. Net income in real terms equates to R12.2 billion (as opposed to R29.3 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.

Technology share of investment

Total Project Costs (Rand billion)



R74.7 billion



37%

R64.7 billion



32%

R58.4 billion



29%

R1.0 billion



0.5%

R2.8 billion



1%

R0.3 billion



0.1%

Average investment per MW for each technology group¹

Average investment cost (Rand million/MW)



22



27



97



51



55



21

Tech	IRP 2010 (2013) Rm/MW	REIPPPP Rm/MW (Project Value)	REIPPPP Rm/MW (Total project costs)
	15	17	22
	29	20	27
	48	63	97

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 MW (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.

Broader economic and socio economic impacts

Total procurement spend¹

(Rand billion)

planned³

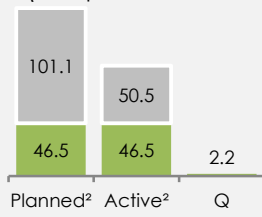


147.6

Rand billion

actual

(inception to date + Q)



Of which construction spend¹

(Rand billion)

planned³

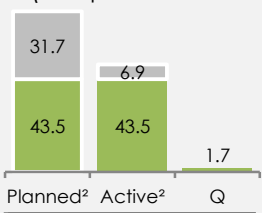


75

Rand billion

actual

(inception to date + Q)



Of which operations spend

(Rand billion)

planned³

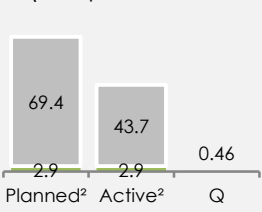


72

Rand billion

actual

(inception to date + Q)



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 R75 billion, more than that of the projected operations procurement spend over the 20 years operational life (R72 billion). The combined (construction and operations) procurement value is projected as R147.6 billion, of which R46.5 billion has been spent to date. For construction, of the R43.5 billion already spent to date, R34.5 billion is from the 54 projects which have already been completed. These 54 projects had planned to spend R31.6 billion. The actual procurement construction costs have therefore exceeded the planned costs by 9% for completed projects.

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

NOTE:

Planned



Refers to all projects procured i.e. currently BW1 – BW4, 1S2 & 2S2

Active



Refers to all projects that have commenced construction i.e. currently BW1, BW2, 16 of 17 projects in BW3 and 1 of 2 projects in BW3.5

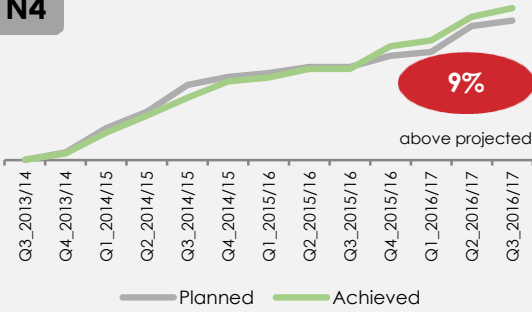
N4

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 and (1 of 2 projects) BW3.5. **Note 3.** BW3 & BW3.5 have been updated from Bid Submission figures to figures as at Financial Close.

Construction spend¹

Actual vs projected (operational projects)

N4



BBBEE spend¹

(Rand billion)

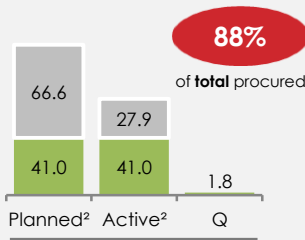
planned³



107.6
Rand billion

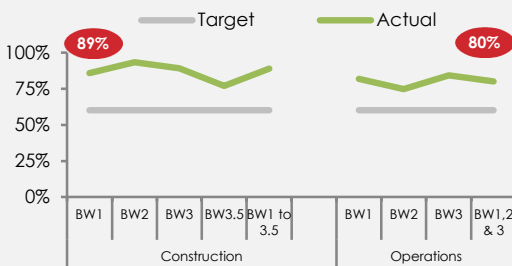
actual

(inception to date + Q)



BBBEE share of spend

Actual vs target (BW1,2,3 & 3.5)⁴



BBBEE spend¹

Construction only (Rand billion)



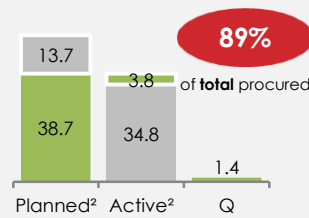
planned³



52.4
Rand billion

actual

(inception to date + Q)



Whereas in earlier quarters actual procurement spend lagged the projected spend, the reverse is true for recent quarters - 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 88%, which is significantly higher than the target of 60%, but also the 73% that had been committed by IPPs. BBBEE as a share of procurement spend for projects in construction is also reported as 89% with operations slightly lower at 80%.

N5

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.

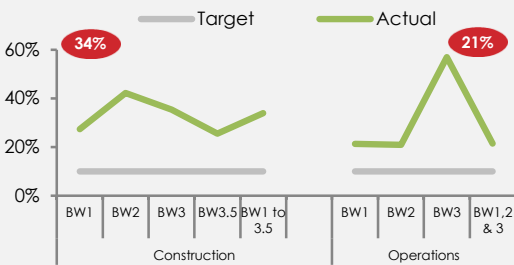
As expected, the majority of the procurement spend to date has been for construction purposes. Of the R43.5 billion spent on procurement during construction, R38.7 billion has reportedly been procured from BBBEE suppliers, achieving 89% of total procured. Actual BBBEE spend during construction for BW1 and BW2 alone was R25.5 billion. The R38.7 billion⁵ spent on BBBEE during construction already exceeded the R34.8 billion that had originally been anticipated by IPPs.

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

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, 1S2 & 2S2 and Active referring to all projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3 and (1 of 2 projects) BW3.5. **Note 3.** BW3 & BW3.5 have been updated from Bid Submission figures to figures as at Financial Close. **Note 4.** Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3 and (1 of 2 projects) BW3.5 and projects in operation i.e. BW1, BW2 and (7 of 17 projects) BW3. **Note 5.** Number rounded.

QSE & EME share of spend

Actual vs target (BW1,2,3 & 3.5)⁴



QSE and EME spend¹

Construction only (Rand billion)

planned³



5.0
Rand billion

actual
(inception to date + Q)



Woman owned share of spend

Actual vs target (BW1,2,3 & 3.5)⁴



Women owned spend¹

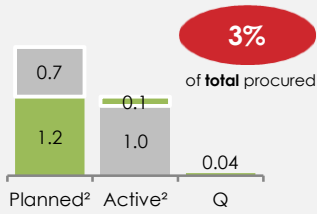
Construction only (Rand billion)

planned³



1.9
Rand billion

actual
(inception to date + Q)



Total procurement spend by IPPs from QSE and EMEs has summed to R15.4 billion (construction and operations) to date, which exceeds commitments by 25% and is 33% of total procurement spend to date (while the required target is 10%). QSE and EME's procurement spend for construction is achieving 34% of total procurement to date and operations is less at 21% however this is still well above the 10% target.

QSE and EME share of **construction procurement** spend totals R14.7 billion⁵, which is almost 3 times the targeted spend for construction of R5.0 billion during this procurement phase.

In contrast, procurement from women owned vendors is lagging, with only 3% for construction and 4% for operations achieved to date against a target of 5%.

When considering only construction spend of women owned vendors, R1.2 billion⁵ has been spent which exceeds the R1.0 billion expected to be spent on projects that have reached financial close.

10 IPPs are still in construction and still need to reach COD. For these 10 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 (dti or similar) capacity building initiatives.

Refer

Page 11 & 12

for detail of the targets and thresholds across bid windows.

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 & 1S2 and Active referring to all projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3 and (1 of 2 projects) BW3.5. **Note 3.** BW3 & BW3.5 have been updated from Bid Submission figures to figures as at Financial Close.

Note 4. Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3 and (1 of 2 projects) BW3.5 and projects in operation i.e. BW1, BW2 and (7 of 17 projects) BW3. **Note 5.** Number rounded.

Local content spend¹

(Rand billion)

45%

local content planned

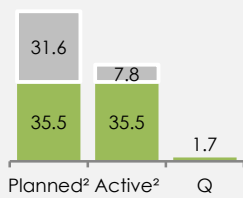
planned⁵

actual

(inception to date + Q)

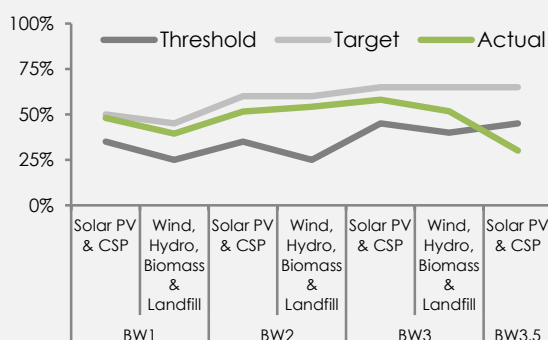


67.1
Rand billion



Local content tracking

Actual % vs target (BW1,2,3 & 3.5)³



35.5 Rand billion



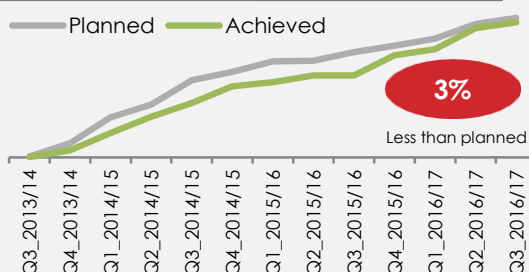
51%

local content achieved

(actual) spend to date on local content

Local content

Actual vs planned (operational projects)



3%

Less than planned

Local content¹

N7

40

The REIPPP programme 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 R75 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 R67.1 billion, i.e. **45% of total project value** (R147.6 billion for all bid windows).

Actual local content spend reported for IPPs that have started construction amounts to R35.5 billion against a corresponding project value (as realised to date) of R70.1 billion. This means **51% of the project value has been locally procured**, exceeding the 45% commitment from IPPs and the thresholds for BW1 – BW4 (25% - 45%)⁴.

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 however, the R35.5 billion local content spend reported by active IPPs is 82% of the R43.3 billion local content expected. This is despite only 54 of the 64 projects having reached COD (i.e. 84% of the portfolio complete).

For the 54 projects that have reached COD, local content spend has been R26.9 billion, which represents 97% of planned local content spend of R27.7 billion.

Refer

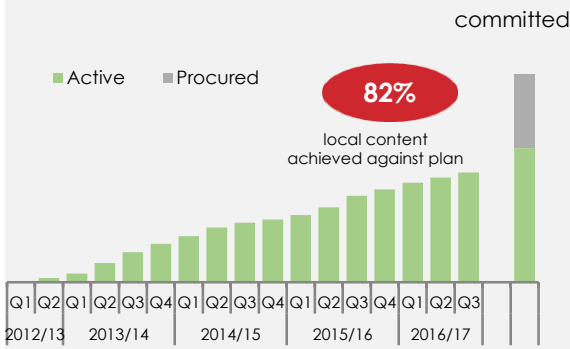
Page 11 & 12

for detail of the targets and thresholds across bid windows.

Note 1. Local content is expressed as % of total project value and not procurement or total project costs. **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 and (1 of 2 projects) BW3.5. **Note 3.** 16 of 17 projects in BW3 and 1 of the 2 BW3.5 projects have reached financial close and started construction. **Note 4.** Thresholds and targets are bid window specific and technology dependent. **Note 5.** BW3 & BW3.5 have been updated from Bid Submission figures to figures as at Financial Close.

Local content

Actual cumulative¹ (Rand billion)



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 projects¹ totals 82% of their commitment.

N5

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.

Construction vs operations

Employment split (job years)



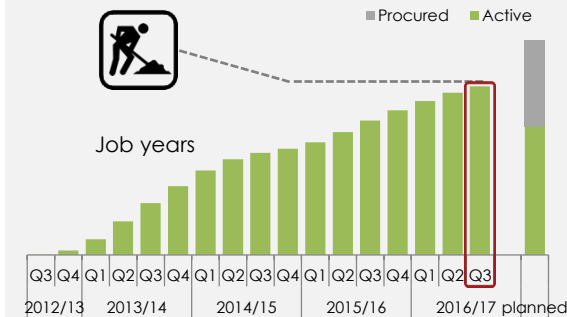
Leveraging employment opportunities

N6

Numerous employment opportunities are being created by the REIPPPP. To date, a total of 29 888² job years³ have been created for South African citizens, of which 27 224 were in construction and 2 663 in operations.

Construction employment

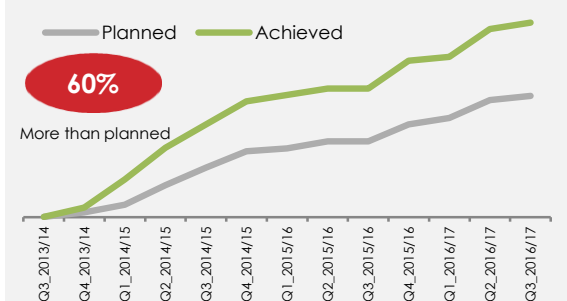
Actual cumulative¹ (Job years)



Even though BW3 (16 of 17) and BW3.5 (1 of 2) projects have only just started construction, employment opportunities across all the four bid windows are 132% of the planned numbers during the construction phase (i.e. 20 689 job years), with 10 projects still in construction and employing people. The number of employment opportunities should therefore continue to grow beyond original expectations.

Construction employment

Actual vs planned (operational projects)



By end December 2016, 54 projects had successfully completed construction and moved into operation. These 54 IPPs had planned to deliver 13 528 job years during the construction phase, but achieved 21 690. This is 60% more than planned.

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 in BW3 and 1 of 2 projects in BW3.5). **Note 2.** Numbers are rounded. **Note 3.** The equivalent of a full time employment opportunity for one person for one year.

Local citizen employment

Actual vs target (BW1,2,3 & 3.5)¹



Employment opportunities

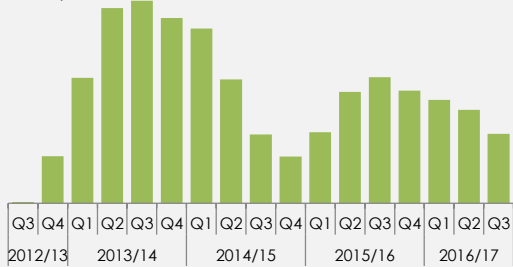
Actual (Job years) (active projects)²



27 224

Job years

■ Construction



Operations employment

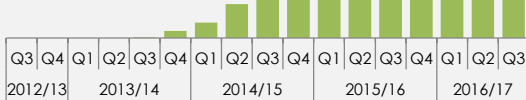
Actual (Job years) (operational projects)



2 663

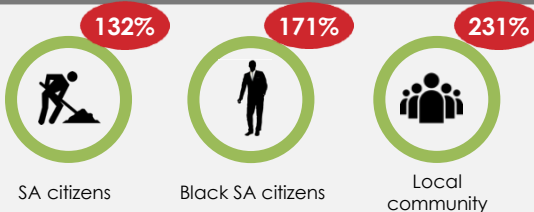
Job years

■ Operations



Employment equity

Construction job years vs planned (active projects)²



Employment thresholds and targets were consistently exceeded across the entire portfolio. The average share of South African citizens of total South Africa based employees for BW1 – BW3.5¹ was 90% 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. However, construction jobs rose once again in Q1 2015/16 as BW3 projects started construction.

To date, 54 IPPs have started commercial operations, with an average operating duration of approximately 22 months. As expected, limited employment numbers are therefore available for the operations phase at present.

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, 27 224 job years for SA citizens were achieved during construction, which was 32% above the planned 20 689 job years. These job years should rise further past the planned target as more projects enter the construction phase.

Significantly more people from local communities were employed during construction than was initially planned. The expectation for local community participation was 6 772 job years. To date 15 654 job years have been realised (i.e. 131% greater than initially planned), with 10 projects, which have reached financial close, still to reach COD.

The number of black SA citizens employed during construction also exceeded the planned numbers by 71%.

Refer

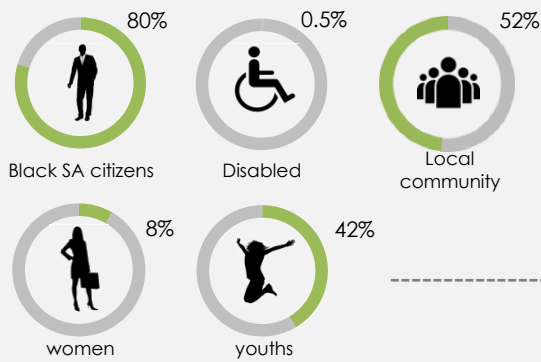
Page 11 & 12

for detail of the targets and thresholds across bid windows.

Note 1. Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3 and (1 of 2 projects) BW3.5 and projects in operation i.e. BW1, BW2 and (7 of 17 projects) BW3. **Note 2.** Actuals/planned for Active projects - referring to all projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3 and (1 of 2 projects) BW3.5.

Employment equity share of persons employed in construction

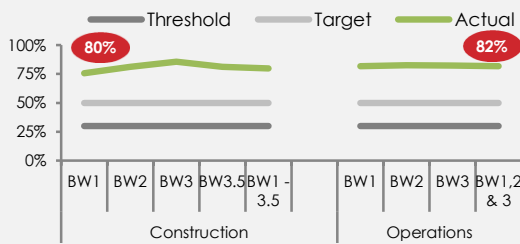
(% job years vs total) (active projects)¹



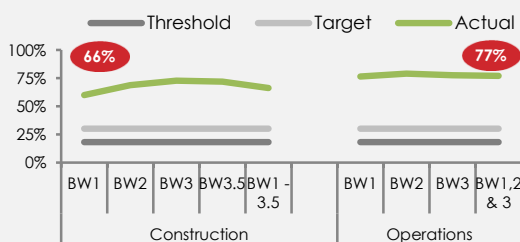
Employment equity share of persons employed

Actual % vs target (BW1,2,3 & 3.5)²

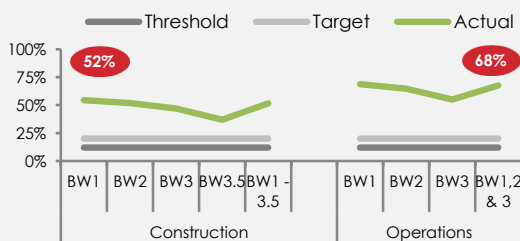
Black citizens as % of SA based employees



Skilled black citizens as % of skilled employees



Local community members as % of SA-based employees



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 is 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 80%, 42% and 52% of total job opportunities created by IPPs 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.

Refer

Page 11 & 12

for detail of the targets and thresholds across bid windows.

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 (80%) and the early stages of operations (82%) 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 and operations is exceeding the 30% target and is at least 3.5 times more than the minimum threshold of 18%.

The share of local community members as a share of SA-based employees was 52% and 68% for construction and operations respectively – at least 4 times more than the minimum threshold of 12% and more than 2.5 times more than the target of 20%.

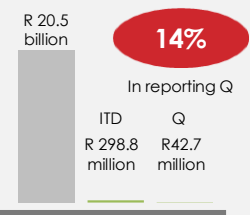
Note 1. Actuals tracked against Active projects - referring to all projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3 and (1 of 2 projects) BW3.5. **Note 2.** Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3 and (1 of 2 projects) BW3.5 and projects in operation i.e. BW1, BW2 and (7 of 17 projects) BW3.

Socio-economic development (Rand billion)

Committed



Realised (ITD + Q)



Socio-economic development (SED) contributions

N5 N6

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 operation life 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 **commitment** level is **2.2% or 125% more than the minimum compliance threshold.**

Across the seven bid windows, a total contribution of R20.5 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R1 027 million.

Of the total commitment, R16.5 billion is specifically allocated for **local communities** where the IPPs operate.

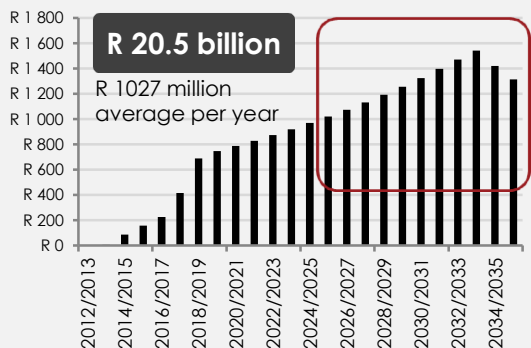
As a percentage of revenue, SED obligations become effective only when operations commence and revenue is generated. Of the 64 IPPs that have started construction (BW1 – BW3.5¹), 54 are operational (3 additional projects became operational in this reporting quarter).

With every new IPP on the grid, revenues and the respective SED contributions grow in substantial steps. 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 R298.8 million to date. Of this, R42.7 million or 14% was spent in this reporting quarter.

SED future contribution forecast

(Rand million)



SED in local communities

(Rand billion)



R 16.5 billion committed to local communities

Note 1. 16 of 17 projects in BW3 and 1 of the 2 BW3.5 projects have started construction. The remaining 2 projects still need to reach financial close.

299



Rand million

1.1%

of revenue

(actual) contribution realised for **socio-economic development**

Activity spread for ED and SED

Projects spend reported to date (% of total)



40%

education and skills development



24%

social welfare



4%

health care



8%

general administration



24%

enterprise development

For the 54 projects that are operational, the actual SED contribution of R299 million to date represents approximately 1.1% of total revenue generated to date. These 54 IPP projects had committed 1.5% over the 20 year project operational life.

The variation is largely one of timing only, with IPPs that have made large commitments not yet operational.

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.

N5

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

By province, the largest share of SED and enterprise development expenditure has been spent in the Northern Cape. This is unsurprising because the Northern Cape boasts the largest portfolio of operational, renewable energy IPPs. The Eastern Cape and Western Cape provinces follow as second and third, respectively.

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.

Key learning



IPP commitments for SED and enterprise development interventions need to be better coordinated, monitored and aligned to existing needs identification and financing mechanisms for improved effectiveness and societal upliftment.

Key learning



Some IPPs have introduced Socio-Economic Development departments within their organizations, while others have engaged / contracted with ED Specialist organisations to plan and effectively deliver community upliftment, however there is still room for improvement.

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

(Rand billion)

Committed



0.7%

of revenue

R 6.4 billion

Realised (ITD + Q)

R 6.4 billion

15%

In last Q

ITD

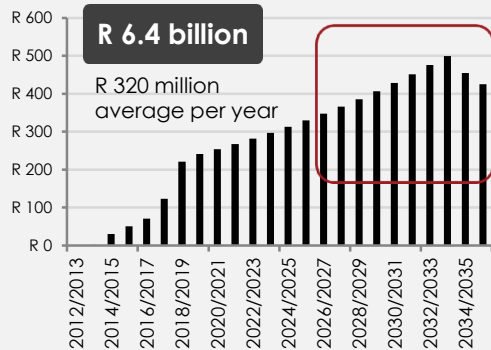
R 94.6 million

Q

R 14.2 million

ED future contribution forecast

(Rand million)



Enterprise development in local communities

(Rand billion)



R 4.9 billion

committed to local communities

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. However, for the current portfolio, IPPs have committed an average of 0.7% or 17% more than the target.

Enterprise development contributions committed for BW1 to BW4, 1S2 and 2S2 amount to R6.4 billion. Again, assuming an equal distribution of revenue over the 20 year project operational life, enterprise development contributions would be R320 million per annum.

Until the end of this reporting period, a total of R94.6 million has been contributed to enterprise development by the 54 operating IPPs. Of the R94.6 million, R14.2 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, R4.9 billion is specifically committed directly within the local communities where the IPPs operate, contributing significantly to local enterprise development. A total contribution of R83.1 million has already been made to the local communities (i.e. 88% of the total R94.6 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 as 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.

Outcome 10



Enhance our environmental assets and natural resources.

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 1.015¹ 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 | Impact indicators¹

	Impact indicator	Baseline	2019 target
1	Reduced total emissions of CO ₂ (not specified, but DoE contributing to Environmental Affairs)	Mitigation opportunities, DEROs to be developed, M & E system being developed.	34% reduction from "Business As Usual" by 2020 and 42% by 2025

Relevant sub outcomes

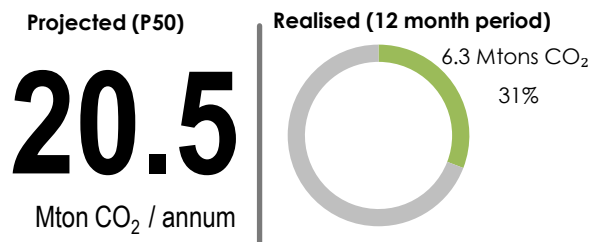
Sub Outcomes
<ul style="list-style-type: none"> Sub-Outcome 3: An environmentally sustainable, low carbon economy resulting from a well-managed just transition

Emission reductions achieved

Using this approach, the emission reductions for the programme during the preceding 12 months is calculated as 6.3 million tonnes CO₂ (Mton CO₂)³ based on the 6 230 GWh³ energy that has been generated and supplied to the grid over this period. This represents 31% of the total projected² annual emission reductions (20.5 Mton CO₂) achieved with only partial operations. A total of 13.3 Mton CO₂³ equivalent reduction has been realised from programme inception to date.

Carbon emission reductions³

Projected using P50 (Mton CO₂)



Carbon emissions

Baseline EF of national grid approx **1.015** ton CO₂/MWh

2019 Target **0.65** ton CO₂/MWh (assuming a direct translation of outcome 10 target)

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:

Educating for
Development

Outcomes 1, 5, 11 and 14



Photo source: <http://picovico.com/>

Towards a sustainable future

The importance of education and skills development for self-reliance in South Africa

The UNDP appropriately contends that people are the real wealth of nations and are, therefore, the main focus of development efforts. The World Bank Education Strategy 2020¹ states that education is a necessary prerequisite for societal development and economic growth.

According to research, the impact of education on people's lives manifests in informed decision-making, improved parenting, sustained livelihoods, adoption of new technologies, responsible citizenry and effective stewardship of the natural resources endowed on nations. Other developmental benefits of education include better health, reduced fertility, an enhanced ability to cope with economic shocks and increased civic participation.

It is these elements that demonstrate the efficacy of education in improving the quality of life of people and how it advances societal wellbeing in ways that transcend benefits to the individual and the family, as it contributes to economic prosperity and reducing poverty and deprivation.

Countries with low levels of education remain in a trap of technological stagnation, low growth, and low demand for education. Education or the lack thereof, plays a key role in entrenching inequality. By fully recognising the power of education, policy makers could better address diverse societal challenges.



Source: <https://sites.tufts.edu/educationforsustainablecommunities/>

“Education is a human right with immense power to transform. On its foundation rest the cornerstones of freedom, democracy and sustainable human development”

— Kofi Annan

Note 1. World Bank. (2011). World Bank Group Education Strategy 2020: Learning for All - Investing in People's Knowledge and Skills to Promote Development. Washington DC: World Bank. Available at:

http://siteresources.worldbank.org/EDUCATION/Resources/ESSU/Education_Strategy_4_12_2011.pdf

UNESCO¹ states that despite tremendous gains in primary school enrolment between 1990 and 2012, when the number of children enrolled in primary schools more than doubled, no African country has achieved universal primary education, and about half of all out-of-school African children will never enrol in school in their lifetime.

Despite more schooling, for too many students, it has not resulted in more knowledge and skills. The results of substantial resources spent on education have thus been disappointing in terms of learning outcomes. Youth are leaving school and entering the workforce without the knowledge, skills, or competencies necessary to adapt to a competitive and increasingly globalized economy.

One of the most critical messages that emanates from the World Bank Education Sector Strategy 2020 is that **education should lead to more learning**. For this to happen, it is crucial to measure learning and evaluating what works in improving learning, whilst using this evidence to inform policy change and investments. The Strategy states that **learning – not only schooling** – is critical for children and youth to succeed. And such learning should be **all-inclusive, learning for all** – giving not just some but all children an opportunity to learn for a nation to prosper. The strategy calls for:

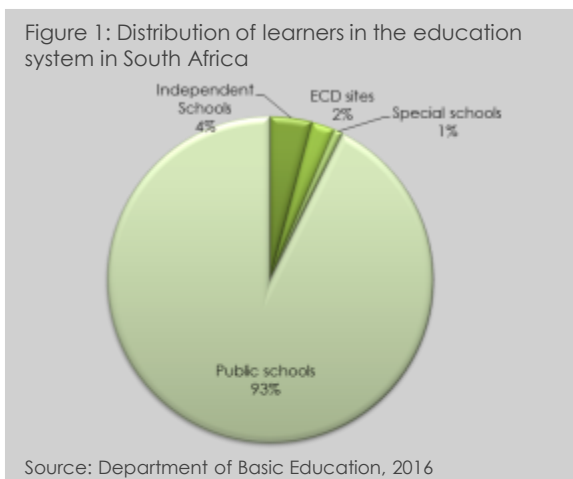
- **Investing early:** because the foundational skills acquired early in childhood make possible a lifetime of learning;
- **Investing smartly:** because investments that prioritize learning and skills development – and their measurement, to inform reform – are most effective in producing results; and
- **Investing for all:** targeting girls and disadvantaged populations, because a nation can only prosper when all children enjoy an opportunity to learn.

Overview of the education system in South Africa

In South Africa in 2014², there were 30 500 established public and registered independent education institutions. Of these, 25 741 were ordinary schools and 4 759 were other education institutions – namely, ECD centres and special schools. In total, there were 13 068 855 learners and students in the basic education system, who attended 30 500 education institutions and were served by 448 105 educators. The ordinary schools comprised:

- 14 927 primary schools, with 6 655 171 learners and 201 673 educators;
- 6 068 secondary schools, with 3 910 643 learners and 143 990 educators; and
- 4 746 combined and intermediate schools, with 2 089 622 learners and 79 427 educators.
- ECD centres had 295 942 (2.3%) learners, whilst 117 477 (0.9%) were in special schools.

Most of the private schools are located in Gauteng and the Western Cape.



“Education means inspiring someone’s mind, not just filling their head”
– Katie Lusk

Note 1. Africa-America Institute (AAI). (2015). State of Education in Africa Report 2015. Available at: <http://www.aacionline.org/wp-content/uploads/2015/09/AAI-SOE-report-2015-final.pdf>

Note 2. Department of Basic Education (DBE). (2016). Education Statistics in South Africa 2014. Pretoria: Department of Basic Education. Available at: <http://www.education.gov.za/Programmes/EMIS/StatisticalPublications.aspx>

Table 1 below presents summary data relating to number of learners, educators and schools, and learner-educator ratio (LER), learner-school ratio (LSR) and educator-school ratio (ESR) in the ordinary public and independent school sector, by province, in 2014.

- There are fifty registered and accredited public TVET Colleges in South Africa which operate on more than 264 campuses spread across the rural and urban areas of the country. Public TVET Colleges are subsidized by the state with approximately R8 billion per year. There are more than 700 000 students in public TVET colleges and the 2019/2020 target is that there should be 1 238 000 students in these colleges¹.
- There are now 26 public universities and over a hundred private higher education institutions in South Africa, down from the 36 public institutions and over 300 private institutions that previously subsisted. There are almost a million students in the public sector universities, which represents an exponential growth from the half million in 1994, as well as some 90 000 in private higher education².
- Overall, student enrolments increased by 23% from 2008 to 2013. The African student complement in particular increased by 34% from 515 058 in 2008 to 689 503 in 2013. African enrolments increased from 64% of all enrolments in 2008 to 70% in 2013³.

Current challenges

The South African Government allocates approximately 20% of its national budget to education. This is equivalent to nearly 6.4% of Gross Domestic Product (GDP), which is considerably higher than what many other developing countries assign to education.

Despite this, the World Economic Forum's competitiveness index for 2015–2016⁴ places South Africa's quality of education at 120 out of 140 countries and cautions that higher secondary enrolments are insufficient to develop the skills that will be required to facilitate a competitive economy in coming years.

While the 2016 national matric pass rate of 72.5% (including the results of progressed learners) represents a slight improvement of 1.8 percentage points over the 2015 pass rate; the country still has a high-cost, low-performance education system that does not compare favourably with education systems in other African countries, or in similar developing economies. The following attest to this:

- The retention rate for the first nine years of schooling, which are compulsory, is at around 95%. However, the high dropout rate after the nine years of compulsory schooling is worrying. From high school students, who started schooling in 2003 and could have written their final Grade 12 exams in 2015, only about 45% finished high school. The retention rate is stated to be as low as 55% of the total intake in 2003.

Table 1: LER, LSR and ESR in 2014⁵

Province	Learners		Educators		Schools		Indicators		
	Number	As % of National Total	Number	As % of National Total	Number	As % of National Total	LER	LSR	ESR
Eastern Cape	1 946 885	15.4%	64 258	15.1%	5 732	22.3%	30.3	340	11.2
Free State	672 290	5.3%	24 552	5.8%	1 376	5.3%	27.4	489	17.8
Gauteng	2 191 475	17.3%	77 265	18.2%	2 721	10.6%	28.4	805	28.4
KwaZulu-Natal	2 901 697	22.9%	95 560	22.5%	6 151	23.9%	30.4	472	15.5
Limpopo	1 720 585	13.6%	57 256	13.5%	4 076	15.8%	30.1	422	14.0
Mpumalanga	1 057 788	8.4%	35 000	8.2%	1 867	7.3%	30.2	567	18.7
Northern Cape	289 004	2.3%	9 182	2.2%	577	2.2%	31.5	501	15.9
North West	800 316	6.3%	26 086	6.1%	1 570	6.1%	30.7	210	16.6
Western Cape	1 075 396	8.5%	35 931	8.5%	1 671	6.5%	29.9	644	21.5
South Africa	12 655 436	100.0%	425 090	100.0%	25 741	100.0%	29.8	492	16.5

Source: 2014 SNAP Survey

Note 1. TVET Colleges South Africa. (2017). Public TVET Colleges. [Online]. Available at: http://www.fetcolleges.co.za/site_public_fet.aspx

Note 2. Council on Higher Education (CHE). (2016). South African Higher Education Reviewed: Two Decades of Democracy. Pretoria: CHE.

Note 3. Council on Higher Education (CHE) South Africa. 2013 Higher Education Data: Participation. [Online]. Available at:

http://www.che.ac.za/focus_areas/higher_education_data/2013/participation

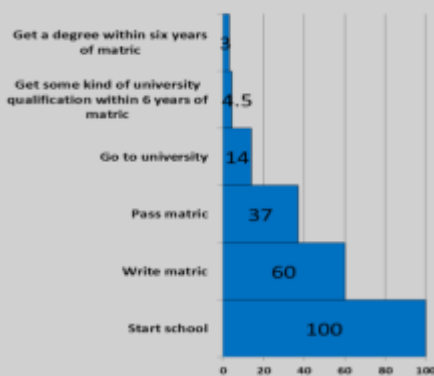
Note 4. World Economic Forum. (2015). The Global Competitiveness Report 2015–2016. Geneva: World Economic Forum. Available at: [http://www3.weforum.org/docs/gcr/2015-](http://www3.weforum.org/docs/gcr/2015-2016/Global_Competitiveness_Report_2015-2016.pdf)

[2016/Global_Competitiveness_Report_2015-2016.pdf](http://www3.weforum.org/docs/gcr/2015-2016/Global_Competitiveness_Report_2015-2016.pdf) **Note 5.** The total number of learners in the table excludes early childhood development and special needs learners, whilst the total figure on the previous page includes those two figures.

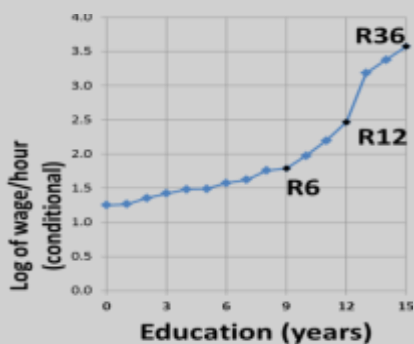
- In the Trends in International Mathematics and Science Study (TIMSS) assessments (several years from 2002), South African Grade 8 students achieved the lowest average scores in both Mathematics and Science out of 46 countries, including six African countries.
- At the primary school level, South Africa came last out of 40 countries in the Progress in International Reading Literacy Study (PIRLS 2006).
- South Africa's performance at Southern Africa Consortium for Monitoring Educational Quality (SACMEQ) is slightly below the average of the other participating African countries in Grade 6 Mathematics and Reading, despite benefiting from better access to resources, more qualified teachers and lower pupil-to-teacher ratios.

Figure 2: Poor Educational outcomes entrenches inequality

The qualifications hierarchy



Education and wages



Source: Van den Berg, S (2016). Education and Inequality. ReSEP, Department of Economics, University of Stellenbosch

In addition, the education system tends to reinforce patterns of privilege and poverty:

- Not only is the cognitive performance of South African children disturbingly low, it is also highly unequal. The poorest 20% of learners perform worse than the richest 20% of learners and South Africa's rural children do far worse than rural children in most other countries.
- The divide in the performance of rich and poor children is already noticeable from early in primary school:
 - By Grade 3 there are already large gaps in the performance of school children in the top 20% of the population (top quintile) versus those in the bottom 80% (bottom four quintiles).
 - Given the importance of the Foundation Phase and the magnitude of the observed gap by Grade 3; by the age of 8 years many children from poor communities may have already been deprived of some career choices.

Early Childhood Development (ECD) challenges

Many of South Africa's very young children are negatively affected by a range of social and economic challenges such as access to health care, education, social services and quality nutrition. This has undermined the development of many children in the country. A 2011 study found that:

"...an unsafe and impoverished learning environment often is associated with substandard ECD with limited development opportunities..." (Department of Basic Education, Department of Social Development & UNICEF, 2011: 94)¹.

A total of 685 511 young children had received a subsidy at an ECD centre in South Africa by the end of the 2014/15 financial year.

"No country can really develop unless its citizens are educated."

— Nelson Mandela

Note 1. Atmore, E., Van Niekerk, L. and Ashley-Cooper, M. (2012). Challenges Facing the Early Childhood Development Sector in South Africa: A Comprehensive Research report on Early Childhood Development to the National Development Agency (NDA). Available at: <http://www.nda.org.za/home/43/files/Research%20Reports/Challenges-facing-ECD-Sector-in-SA-Prof-Atmore.pdf>

Although access to early childhood development programmes is steadily improving, with 33.8 per cent of children from birth to four years attending an early childhood development centre and 16 per cent being with child-minders or day mothers in 2014, early learning and care programmes are not universally available or equitably accessible to vulnerable children.

The poorest children have the least access, in part, due to the inability of caregivers to pay user fees. Generally, approximately 20 per cent of birth to four-year-old children in the poorest 40 per cent of households has access to some form of out-of-home care.

The quality of programmes currently provided at many partial care facilities providing early childhood development programmes in impoverished communities is also insufficient to ensure good child outcomes and children with disabilities are largely excluded from any of these programmes (National Integrated Early Childhood Development Policy, 2015)¹.

Provision of services in these areas is severely limited by a combination of issues, including insufficient funding and governance challenges related to deficient institutional arrangements, leadership and coordination).

“Nurturing Young Minds for a Brighter South Africa” IPP contributions addressing challenges in Early Childhood Development

Metrowind Van Stadens Wind Farm – Support to Nomzamo Crèche in Witteklip, Eastern Cape

The Nomzamo Crèche in Witteklip was originally established in the mid-1990s as a community initiative. Over the years the crèche had periods where it had not been operational due to a lack of funding. However, in May 2015 Ntombizanda “Zanda” Plaatjie re-opened the crèche with the support of Metrowind Van Stadens Wind Farm, as part of the Metrowind Community Development Program (MCDP). Zanda, who attended the crèche in the 1990s, understood the benefit of the crèche and due to the passion she has for education, wanted to create an opportunity for the children of the Witteklip community to access education from this crèche as she had.

Within a few months of being re-opened children from the Fitch’s Corner and St Albans communities also started attending the crèche. At the start of the 2016 school year the crèche was reporting an attendance of 68 children from Witteklip, Fitch’s Corner and St Albans.

The teachers expressed a wish to see the crèche registered as an Early Learning Centre with the Department of Social Development. Consequently, Metrowind has partnered with Isivuno Training, a registered Public Benefit Organisation (PBO), to assist the crèche with the establishment of proper educational and operational processes that will ultimately lead to registration.

As a result of the assistance of Metrowind, Zanda is set to become an outstanding ECD practitioner. Prior to re-opening the crèche, Zanda worked as a stock-taker, merchandiser and shop assistant, and was involved in adult literacy training in Witteklip. Over the past financial year, she has been sponsored to attend formal training and through the involvement of Isivuno Training, Zanda, along with the other teachers, and received monthly practical training and guidance, both in and outside of the classroom.

The progress made by the crèche over the past year has been remarkable. Under the guidance of Isivuno Team it is transforming from a day-care facility to an early learning centre of note in the community. The crèche has introduced formal enrolment processes, roles and responsibilities for the teachers and caregivers, a structured daily programme, discipline within the classrooms, and educational activities that are laying foundations for future education and learning.

The children have been divided into different classes according to age groups in order to enable age appropriate activities and the teachers are continuously being equipped and guided in terms of facilitating class activities. An affordable, yet nutritious menu has also been introduced and Zanda has embarked on the process of establishing a School



Photo credit: Metrowind Van Stadens Wind Farm

Note 1. Republic of South Africa. (2015). National Integrated Early Childhood Development Policy. Pretoria: Government Printers.

Governing Body to facilitate proper governance of the school and greater parents' involvement. To date, the crèche depends completely on Metrowind funding of R350 000 so far, because only a handful of parents can afford and have paid the R50 monthly fee.

Looking ahead into the future, the aim is to see the crèche become self-sustainable and able to operate independently. Apart from the continued mentorship and training of the teachers to develop their teaching skills, other goals include:

- To assist Zanda qualify as an Early Childhood Development (ECD) teacher
- Registration of the crèche as a Non-Governmental Organisation (NGO) as well as with the Department of Social Developments (which is a legal requirement according to the Children's act 38 of 2005)
- Equipping the teachers with skills needed to operate and manage the crèche as an NGO, which will include budgeting, preparation of funding applications and reporting.
- To advance the teachers ability to follow lesson plans that will stimulate the children to develop cognitively, emotionally, socially, physically, morally and spiritually as required by the Departments of Social Development and Education.

It is too early to measure the impact of the Nomzamo Crèche, given that it has re-opened only 20 months ago in May 2015. However, with the measures that are being put in place, the school-readiness of the 68 children from poor households in Witteklip, Fitch's Corner and St Albans should improve, thereby strengthening their foundation educational phase that is so critical for lifting them permanently out of poverty.

Basic education challenges

Various studies by Van der Berg et al. (2016)¹ found that an estimated 60% of South African children do not learn to read for meaning in any language by the end of Grade 3. Most South African children are not acquiring the most basic reading skills, in any language, and are, therefore, excluded from the learning process right from the beginning and never fully grasp what is taught despite being promoted to higher grades. The central tenet of proposals presented by van der Berg et al. (2016) to address these challenges rests on the contention that learning to read for meaning and pleasure in the Foundation Phase should be the single most important goal for primary schooling.

It is with this in mind that this feature also showcases the work that IPPs are doing to promote the ability to read among primary school learners in schools around the country.

The basic education system in the country is currently facing a plethora of challenges. Constraints include:

- poor English knowledge by both teachers and students, which limits both teaching and learning and emerges in the inability to learn for meaning;
- teacher absenteeism exacerbated by strong unions who appear unwilling to address the issue;
- quality teaching and a proper structured learning process is lacking in many instances;

- township schools are still poorly resourced in every sense and lack the appropriate framework to facilitate safe and proper teaching and learning environments for both teachers and students;
- teacher shortages, underqualified teachers and poor teacher performance;
- failure to constitute and effect appropriate inspection and monitoring.

Studies reveal that the root causes of South Africa's low educational outcomes, while multidimensional, generally fall into two broad categories, namely: (a) lack of accountability, and (b) lack of capacity. As a result, proposed solutions should seek to address both of these elements for fundamental changes to occur. Parallel to this, research indicates that there are four binding constraints to improved educational outcomes for the poor in South Africa. These are:

- Weak institutional functionality;
- Undue union influence;
- Weak teacher content knowledge and pedagogical skills;
- Wasted learning time and insufficient opportunity to learn.

Note 1. Van der Berg, S., Spaull, N., Wills, G., Gustafsson, M. and Kotzé, J. (2016). Binding Constraints in Education: Synthesis Report for the Programme to Support Pro-poor Policy Development (PsPPd). Available at: http://resep.sun.ac.za/wp-content/uploads/2016/05/PSPPD_BICiE-email.pdf

“Learning Today . . . Leading Tomorrow” IPP contributions addressing challenges in Basic Education

Globeleq Reading Coach Programme funded through contributions from the Jeffreys Bay Wind Farm, De Aar Solar Power and Droogfontein Solar Power

Consistent with the finding of the study on 'Identifying Binding Constraints in Education' conducted by Van der Berg et al. (2016) that “the ability to read is central to the ability to learn” and that “every child must learn to read by the end of Grade 3”; Globeleq has been supporting a 'Reading Coach Programme' in all three beneficiary community areas since 2014. The aim of the Programme is to improve the literacy and numeracy skills of learners at the Foundation Phase so that their potential to progress up the education ladder is not limited.

Jeffreys Bay Wind Farm

The IPP has implemented the Programme across twelve schools within a 50km radius of the wind farm in the Eastern Cape. The Programme incorporates a number of elements, namely:

- training,
- provision of resources,
- youth employment opportunities created for twelve previously unemployed matriculants; and
- Bursaries funded through the Renewable Energy Skills Development Fund for their Tertiary studies in Education which commenced in the 2017 academic year.

The programme also offers work experience, which is valuable for the reading coaches' future employment opportunities.

Over R262, 000 has been contributed towards the Programme and part of these funds are used to pay the monthly stipend for the reading coaches. In addition, a R7000 donation of reading books in three languages has been made to each school involved in the Programme since 2014.

De Aar Solar Power

The De Aar Solar Power implements the Reading Coach Programme across fourteen schools in De Aar, Hanover and Britstown in the Northern Cape, in conjunction with the Department of Education at a cost of R430 000 per annum.

The Programme was initiated by the Department of Education, which is currently training 130 Grade R practitioners, of which 30 will be based in the De Aar, Hanover, Britstown, Phillipstown and Petrusville areas.

The programme was designed by the Department of Education as an intervention to improve literacy and numeracy, as a work opportunity programme for unemployed youth with mathematics and language proficiency and as a screening initiative so that the Department would recruit students with teaching acumen into their teacher training bursary programme. Training of the Reading Coaches commenced on 15th July 2014, during the school holiday period. The fourteen teachers that have been trained were allocated the Reading Coach resources.

To date, a total of R512 000 has been contributed towards this Foundation Phase Reading Coach Support Programme.

Droogfontein Solar Power

Five schools in Riverton, Ritchie and Barkley West have benefitted from this Programme via the Droogfontein Solar Power. The Programme is being implemented in conjunction with the Department of Education at a cost of R421 850. The Programme was initiated by the Department of Education, which is currently training 130 Grade R practitioners, of which 20 are based in Riverton, Ritchie, Barkley West and Kimberley. The Reading Coaches for this Programme have been trained and given the relevant resources. In addition, the schools have received donations of books.

The main beneficiaries of the Reading Coach Programme are the learners in the various schools as well as their educators. In addition, the previously unemployed youth that are now employed as Reading Coaches are also key beneficiaries as Globeleq is funding their B-Ed studies with UNISA through the Renewable Energy Skills Development Fund which is to be administered by Study Trust.



Photo credit: Globeleq

Globeleq Spell IT Programme through the Jeffreys Bay Wind Farm, De Aar Solar Power and Droogfontein Solar Power

The Spell IT Programme, which is closely related to the Reading Coaches Programme, is aimed at helping primary school learners to achieve competency at Grade 4 international reading and spelling levels with the aims of improving matric pass rates and help learners to be better prepared for tertiary education and later employment. International tests are used to determine the reading speeds and literacy rates of learners in English and Afrikaans. This verification is undertaken independently of the Annual National Assessments (ANA) results. The purpose of the programme is to address the concerns that Grade 12 learners in their final examinations are often not successful because they are unable to read their examination papers with comprehension at the appropriate reading speed which means that many of them don't complete their papers in the allocated time.

Spell IT's goal is "Learn-Ready", a literacy programme, which has impacted 350 000 primary school children since 2010. This programme is implemented through partnerships with the National Department of Basic Education and the various provincial departments.

"This programme is ... in line with international research ..."

– Marion Green-Thompson, Economic Development Manager, Globeleq

"This programme is ideally focused on 4th Grade basic literacy, in line with international research that has shown this to be a critical transition period, when learners move from the 'learning to read' phase into the 'reading to learn' phase," stated Marion Green-Thompson, Economic Development Manager at Globeleq, which runs the three IPP programmes involved in this programme.

The aim is for Grade 4 learners to have a whole word recognition vocabulary of between 5 000 and 10 000 words; and to be able to read at a speed of 123 words per minute. The programme consists of three components, namely: The Vocabulary Assistance Programme (VAP); Teacher Training and Capacity Building; and Spelling Bee Competitions. "The VAP is a step-by-step, fun series of card games, age-appropriate stories and interactive activities that assist learners to build on their existing knowledge while brushing up on the fundamentals of phonetics, spelling rules and word structure," continued Green-Thompson.

The content is Curriculum Assessment Policy Statements CAPS-aligned and gives educators exciting activities to do with their learners in the classroom while covering the required content to get learners spelling at their Grade level.

The Spell IT Programme not only provides a valuable educational experience for the participating learners, but also allows them to engage in healthy competition. Other benefits derived from this fun activity include team building, improved grammar, building a competitive spirit, increased knowledge of the origin of words, developing cognitive skills including the ability to handle pressure; and most importantly, these events help to boost a child's confidence level as they gain self-confidence by learning to speak in public.

Support of Spell IT fits into the Globeleq's commitment and support of local education as part of their socio economic development initiatives. This includes an extensive education audit in the region; an ongoing Early Childhood Development bursary programme; funding of Early Childhood Development classroom equipment, training and provision of teaching aids; and an ongoing Foundation Phase Reading Coach Programme.



"Children are the future of this country. By investing in children's basic education we are contributing to the country's development and creating a literate and self-sufficient society."

– Rick Corsino

“Inclusivity where it matters most”

IPP contributions supporting Remedial/Special needs education

BioTherm Klipheuwel-Dassiefontein Wind Energy Facility - Support to L.R. Schmidt Moravian Primary School Remedial Teacher in Genadendal

This project essentially stems from follow-up and feedback from the Principals' Academy programme which was implemented by the Klipheuwel-Dassiefontein Wind Energy Facility in December 2014. The strong relationships forged by the IPP with the Principals that it supports in the programme resulted in conversations regarding challenges experienced in the running of local schools. One such conversation, which occurred in early 2015, with Mr. Simon Speelman, the Principal of LR Schmidt Moravian Primary School (located in the town of Genadendal), led to the idea of assisting the school in employing a remedial teacher.

The school was experiencing difficulties with some learners in Grade 4 who were not coping with their school work. In part, this is a consequence of the “progression policy” practiced in the South African education system. The basic principle of this policy is that a learner may only fail one year per phase, with each phase consisting of three years (the first or Foundation phase spans from Grades One to Three).

While the intention to ensure that these learners catch up with their peers is noble, it has created detrimental consequences where groups of learners find themselves promoted to Grade 4, while unable or ill-equipped to handle the academic curriculum and demands of that year. Not only does this impact the learners' ability to cope with future Grades' curriculums, but it also begins to create demotivated and extremely frustrated children and educators alike.

The aim of the remedial teacher project is to address challenges that can be termed as “system-based deficits” by way of delivering compensatory lessons via an additional resource, specifically for those learners who have not been able to fully grasp academic competencies and skills in the literacy and numeracy aspects of their learning. This leaves room for the permanently appointed teacher to continue working with the learners who are able to cope with the required curriculum, without having to focus as much of her energy on structuring lessons that cater for learners at various levels of competency.

Since her arrival at LR Schmidt, the remedial teacher, Mrs. Hendricks, has provided focused remedial support to learners with learning challenges, as they moved from Grade 4 (in 2015) to Grade 5 (in 2016), with a primary focus on Afrikaans (Home Language), English (First Additional Language) and Mathematics.

“Mrs. Hendricks has helped many of these children gain confidence. They were not confident, thinking they are incapable. All that has changed and many of them are doing exceptionally well. There's improvement” – Mr. Wessels, Social Sciences teacher, Grade 6

From July 2015, when Mrs. Hendricks began her interventions, to the last year end examinations in December 2016, all 14 learners that she has supported experienced impressive improvements in their marks in both Grade 4 and 5.



Photo credit: BioTherm

“When Mevrou Hendricks started I couldn't speak good English and my Maths marks were very low, but when she came I started doing better, she was patient when I asked questions and now I am in Grade 6 because she taught us so good” - Danielo Davids, Grade 6 learner.

The IPP has been supporting this project for the last 18 months and has spent a total of R135 000, which consists of the remedial teacher's monthly salary of R7 500 per month.

As far as future plans are concerned, the IPP takes a long term view in relation to projects of this nature, since their sustainability requires engagement with a variety of key stakeholders. The ability of the beneficiary schools to take these kinds of projects over with their own funds is almost impossible without engagement with the Department of Basic Education. Should the progression policy remain, there will likely be a long term need for such a resource in schools.

“Working with the children has been a great experience. For the first time in many years, they love Maths and English, and their marks have improved. And it is all made possible by our Principal and the teachers - everyone wants the children to succeed in the future. The money from the wind farm of BioTherm has also made it possible. We are addressing this thing of “slow learners”: there is no “slow learner”, some kids take longer, that's all”

- Mrs. Caroline Hendricks, LR Schmidt Primary School's Grade 5 remedial teacher.

Skills development challenges

According to Quarterly Labour Force data published by StatsSA, 35.8% of young people between the ages of 15 and 34 were unemployed in 2015¹. This is almost double the number (16.3%) of adults aged between 35 and 64 who are unemployed. The labour absorption rate (or employment to population ratio) for adults (58.0%) is almost twice that of young people (32.2%). Young women face even higher levels of unemployment. 40.7% of young women are unemployed compared to 33.8% of young men. The April 2016 StatsSA's 'Social profile of youth'² reiterated the severity of youth unemployment, indicating that levels of youth employment continued to deteriorate over the preceding five years. Among those unemployed, 57% have successfully matriculated.

While the country has made rapid progress toward educational attainment, poor skills continue to hinder the school-to-work transition.

More than 1 in 5 young people (aged 15-29) in South Africa are low-skilled neither employed nor in education or training ("NEETs"), compared to around 1 in 20 in OECD countries. More support is needed for these young people, including second-chance programmes, as well as more learnerships and apprenticeships that are better aligned with labour market needs (OECD Employment Outlook, 2016)³.

Together with increasing levels of youth unemployment, regressing educational outcomes mean that South Africa's youth are at risk of being trapped in poverty perpetuity. This risk, however, can be mitigated by support to the youth to become productive participants in the economy and active members of society via accelerated skills development programmes aimed at instilling a culture of employment-creation, rather than only as work seekers and increased higher education opportunities for the poor.

"Grooming small business for a bright future" IPP contributions addressing challenges in Skills Development

Sishen Solar Facility – Skills Development and Enterprise Development Support to Boitsweletso (Propriety) Limited

Lorato Ntshabeleng was employed as a cleaner during the construction phase of the Sishen Solar Facility, which is located in the Gamagara Municipality, Northern Cape. When the construction phase was near completion, all the staff were informed that their contracts would be coming to an end as another company would be taking over the Operations and Maintenance phase of the facility and that they would be appointing service providers for the various services they would require. Lorato saw the opportunity to become one of these service providers, specifically to provide cleaning services and to this end, she registered her own business and approached the management of the O&M Company and the ED Manager requesting an opportunity to provide these services.

Consistent with the goal of funding the training and development of businesses from the local community and the preferential procurement commitments of the IPP; Boitsweletso (Pty) Ltd, a local, 100% black woman-owned enterprise, was awarded the facilities management contract for 12 months, with a 3-months' probation period, at the beginning of 2015.

Subsequently, Lorato had a frank conversation with the O&M Company and the ED Manager, where all parties recognised that her previous experience as a general worker did not prepare her for the role of business owner, team manager, as well as for the necessary business legislative compliance requirements. She required support to not only manage her business but also to lead a team of employees effectively. Furthermore, she required support to develop financial management and marketing skills to ensure that her business is sustainable beyond the contract with O&M Company.

This is how Boitsweletso became an enterprise/supplier development beneficiary of the Sishen Solar Facility's Enterprise Development activities.

The agreement with Boitsweletso requires the company to only employ people from the local community and made provision for six jobs. After the discussions with Lorato, a local black owned company, Mind Colours Consulting (Pty) Ltd, was appointed to provide business mentorship and coaching to Boitsweletso (Pty) Ltd for a period of 12 months, at the end of which Lorato would be able to adequately run her business independently, efficiently and profitably.

Note 1. Statistics South Africa (StatsSA). (2015). National and Provincial Labour Market: Youth. Available at: <http://www.statssa.gov.za/publications/P02114.2/P02114.22015.pdf> **Note 2.** Statistics South Africa (StatsSA). (2016). Vulnerable Groups Series I: The Social Profile of Youth, 2009–2014. Available at: <http://www.statssa.gov.za/?p=6395> **Note 3.** Organization for Economic Cooperation and Development (OECD). (2016). OECD Employment Outlook 2016: How does South Africa Compare? Available at: <https://www.oecd.org/southafrica/Employment-Outlook-SouthAfrica-EN.pdf>

The plan was to implement the project in the following 3 phases:

- Entrepreneurial Mentorship: this phase introduces the new entrepreneur into the compliance requirements associated with starting a new business, understanding marketing and access to finance as well as general information and capacity building.
- Coaching and on-the-job mentoring: this phase will assess the operational and personal weaknesses of the individual and the business and to tailor a development coaching and mentoring plan to overcome these challenges.
- Leadership Skills Development and Team Building – here Lorato will receive business ethics training as well as situational leadership training using Hersey and Blanchard's Situational Theory methods, and will implement them in her current environment under the observation of the service provider. She and her team will also receive conflict management training.

**“It's amazing to see how Lorato has grown; she's a tough business woman now”
– Jacques Prinsloo, O&M Facilities Manager**

In addition, the project company and O&M company's Human Resources Manager, Finance Manager, Health Safety and Environment Manager and Safety Officer all invested significant time in ensuring that Lorato and Boitsweletso met all the contractual requirements of the O&M Company as well as all the requirements for a business to operate on site. Lorato has also received significant mentorship from the O&M Facilities Manager, Jacques Prinsloo, who recently remarked “It's amazing to see how Lorato has grown; she's a tough business woman now”.

Furthermore, the initial set of protective clothing for Lorato and her employees was purchased by the project company from a supplier that is based in the local community. This was to support Boitsweletso (Pty) Ltd to meet the health and safety requirements for all onsite contractors and subcontractors. To date, the project company has contributed R 108 583 (Excl Vat) for the mentorship and coaching offered by Mind Colours Consulting and R 2 270 (Excl Vat) for purchasing of protective clothing.

The enterprise and skills development support provided by the project company and the O&M Company to Boitsweletso (Pty) Ltd have made a huge impact on Lorato and her business in the following ways:

- It has improved her financial management skills, with Lorato now having proper record keeping a professional invoicing system in place.
- Lorato has grown in confidence to negotiate with both the O&M Company and her suppliers; she is no longer visibly overwhelmed by the various aspects of being a business owner, especially the contract negotiations and people management aspect which used to be a challenge for her in the beginning. This also includes the various legal requirements employers have to comply with.

In 2016 Boitsweletso's contract was renewed and the scope extended to include vegetation control and pest control. This was later expanded to include the supply of consumables. The General Manager of the O&M Company, plant-manager and facilities managers have indicated their satisfaction with the service received from Boitsweletso.

At only 29 years of age, the future is clearly bright for this up and coming entrepreneur. Lorato is well on her way to great success; thanks to the support from the Sishen Solar Facility and its O&M Contractor!

“I have learned that business is all about networking and communication - to satisfy the needs of our clients, to have a positive impact on the communities we operate in, an intensive workforce and to create jobs for our communities.”

– Lorato Ntshabeleng



*Lorato Ntshabeleng and employee
Photo credit: Sishen Solar Facility*

Higher education challenges

Quite a lot has been achieved in the Higher Education sector of South Africa since the advent of democracy. Today, the higher education sector is more unified in terms of governance arrangements, quality assurance processes, qualification types, funding arrangements and enrolment planning processes.

However, serious challenges remain within the sector including¹:

- Demand for Higher Education far outpaces existing capacity; and
- Decline in state funding. Compared to other countries; expenditure on higher education as % of GDP stood at 0.71% in 2012 (see graph on the right), illustrating that funding for higher education is not only declining, it starts out at a much lower level in South Africa than it does in other countries, some of which are developing countries.
- Access and the cost of higher education;
- Unhealthy State-University Relations; and
- Only about 36% of academics in the system hold a PhD, although the NDP proposes a target of 75%, while 20% of academics may be retiring in the next 7-10 years.

Box 1

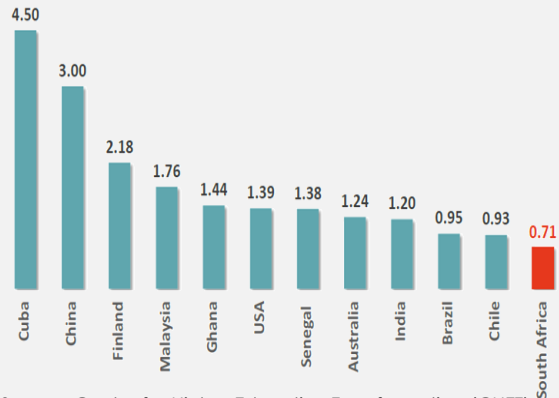
Decline in state funding

Table 2: Funding allocated to universities as a percentage of GDP and of state budget, 2009/10-2014/5

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
% of State Budget	2.24%	2.37%	2.47%	2.51%	2.49%	2.46%
% of GDP	0.68%	0.69%	0.74%	0.76%	0.75%	0.74%

Source: Council on Higher Education, Vital Stats, Higher education, 2014

Figure 3: Expenditure on higher education as a % of GDP, 2012



Source: Centre for Higher Education Transformation (CHET)

“Advancing Knowledge, Transforming Lives” IPP contributions addressing challenges in Tertiary/Higher education

Globeleq Scholarship and Internship Programme through the Jeffreys Bay Wind Farm, De Aar Solar Power and Droogfontein Solar Power

Joe Manyelo and Sulana de Jager, joined De Aar Solar Power as solar technicians last year as part of the beneficiaries of the Globeleq Scholarship and Internship Programme Fund. They both graduated during 2016. Prior to that, they had been interns under the same Programme, which also provided financial support for part of their university studies. To date, the Programme has supported 61 scholarship recipients and 34 interns.

Note 1. Mabelebele, J. (2015). Higher Education in South Africa: Emerging Challenges & Implications for Universities. Available at: https://www.pwc.co.za/en/assets/pdf/he-conference_the-future-of-higher-education-in-south-africa.pdf

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Joe Manyelo – An aspirant inventor and ‘South Africa’s own Steve Jobs’ in the making

Born and raised in Limpopo to a single mom, with six siblings; Joe Manyelo has always been curious about what makes gadgets and electrical appliances function the way they do and is passionate about using his hands to create things from scratch and to fix whatever is malfunctioning around him, particularly electrical appliances. It is therefore unsurprising that Joe recently graduated with a Diploma in Mechatronics Engineering from the Tshwane University of Technology (TUT) and was one of the first interns at the De Aar Solar Power plant. Joe, who has recently been employed by the company as part of its permanent staff complement, is a solar technician and will soon be pursuing a BTech at the Cape Peninsula University of Technology (CPUT) in Cape Town, through financial support from Globeleq. As part of his studies, Joe hopes to build a cooling system for the De Aar Solar Power plant. In addition, he hopes to, one day, be involved in the design of a solar plant. Of his internship and work experience so far, Joe says: “I actually learnt more than I thought I would. In the beginning it was a bit tough to adjust to the working environment but, eventually, because of the people that were around - they were supportive, they motivated and encouraged me, I managed.”



Joe Manyelo. Photo credit: Globeleq

“I actually learnt more than I thought I would.”
– Joe Manyelo

Sulana de Jager – A go-getter with a ‘never die’ attitude

Sulana de Jager grew up on a farm outside Reitz, in the Free State. For her high school education, she attended Ficksburg High School, which exposed her to technical subjects. This fitted in very well with her interest in tractors and basically anything that had an engine. Although she had nursed hopes of pursuing a career in psychology, due to her knack for listening to and counselling others; a seven-year truck driving stint in America scuppered those plans and set her heart on Mechanical Engineering, which ultimately changed to Mechatronics, due to its unique feature of amalgamating the different engineering branches into one programme of study.

Sulana was awarded a Globeleq Scholarship at the beginning of her BTech studies at the Cape Peninsula University of Technology (CPUT) in Cape Town, when she also started working for the company as an intern. In describing her study-work internship experience at Globeleq she says: “It felt like being in a family, that is extremely well educated because you have ten engineers around you that are highly qualified...It was the first time I experienced [such support] in a company and it went all the way from the MD, down to my peers who were working with me in the team...they were always caring and concerned about my wellbeing....it was a complete support system – family-wise, personally, education-wise and professionally.”

In addition, Sulana undertook the SARETEC Wind Turbine Service Technician Course, which has a strong Health, Safety and Environment (HSE) component, to supplement the content of her BTech studies. Again, Globeleq supported her through this, by continuing to pay her salary as she undertook the course. She says the funniest part of her practicals at Gouda Wind Farm “was getting around the nacelle, as I’m not the skinniest person around!”

Asked how her parents view her work in a male-dominated field, she says: “It’s getting better, my dad was not happy and I’m still not allowed to drive his truck!” However, she also concedes that “They’ve accepted it...They’ve now realised that it’s no longer [as] physically challenging [as it may have been previously] because everything is controlled by electronics....I don’t depend on manual labour [all the time]....The point is to carry out some of the manual tasks that come with the job the smart way and not the hard way, as a woman.”



Sulana de Jager. Photo credit: Globeleq

To any other woman, who may wish to enter the renewable energy field, particularly as a solar technician like herself, her advice is: “If you don’t like your hands getting full of grease and oil and if you don’t like being physically challenged everyday of your life; then this is definitely not for you!”



Photo source: <https://ourpangea.files.wordpress.com/>

Changing the world together

Education is important to the IPPP Programme

In the words of Nelson Mandela, "Education is the most powerful weapon which you can use to change the world."

The National Development Plan (NDP)¹ singles out education as a critical building block for development due to the role it plays in building an inclusive society, which provides equal opportunities for all and supporting all South Africans to realise their full potential, especially those previously disadvantaged by apartheid.

A key feature of South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), which differentiates it from other renewable energy programmes in many parts of the world, is that socio-economic development is an integral feature of the programme.

Despite the 'teething' problems experienced by Independent Power Producers (IPPs) in implementing their Socio-Economic Development and Enterprise Development obligations; there is no doubt that their contributions are not only necessary; they are making a huge difference to the poor communities who benefit from them. This Programme is clearly demonstrating that, with the right contractual and institutional framework, the private sector has become deeply involved in promoting socio-economic development where it is most required in our country.

The IPPs are targeting education as a priority area in their socio-economic development programme.

Note 1. Republic of South Africa. (2012). National Development Plan 2030: Our Future - Make it Work. Pretoria: Government Printers. Available at: <http://www.poa.gov.za/news/Documents/NPC%20National%20Development%20Plan%20Vision%202030%20lo-res.pdf>

Table 3 indicates that to date, IPPs have contributed approximately R145 million towards education and skills development in South Africa, since the launch of the REIPPPP in 2011.

This represents approximately 47% of all investments in community development projects that have been undertaken by IPPs in the areas in which their renewable energy plants are located.

Figure 4 illustrates that the Northern Cape contributes the lion's share towards education and skills development at 50%, followed by the Eastern Cape (23%). The North-West only contributes about 0.4% of the total Education and Skills Development contributions made by IPPs.

The IPPs located in Gauteng, Mpumalanga and KwaZulu-Natal have not made any contributions towards education and skills development initiatives either because they have not reached financial close or are at the very early stages of commercial operation.

Arne Duncan, former U.S Secretary of Education describes education as: "... the key to eliminating gender inequality, to reducing poverty, to creating a sustainable planet, to preventing needless deaths and illness, and to fostering peace. And in a knowledge economy, education is the new currency by which nations maintain economic competitiveness and global prosperity."

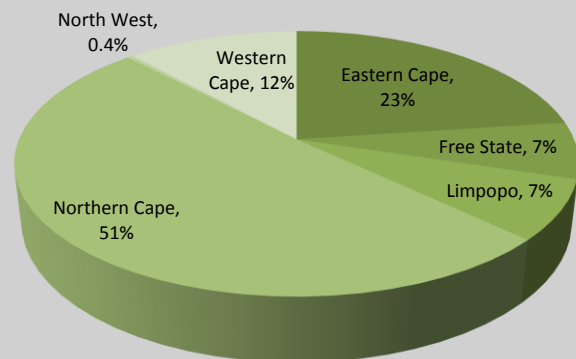
Education is an investment, and one of the most critical investments we can make in our country.

Table 3: IPP Contributions to Education and Skills Development as a % of Socio-Economic Development (SED)¹

Province	Education and Skills Development	Socio-economic Development (SED)	Education and Skills development as % of SED
Eastern Cape	33 200 527	70 201 524	47%
Free State	9 999 511	16 408 953	61%
Limpopo	10 543 339	14 870 103	71%
Northern Cape	73 783 984	164 809 942	45%
North West	517 732	1 401 831	37%
Western Cape	17 083 555	42 165 873	41%
All provinces	145 128 648	309 858 227	47%

Source: IPPPP Office, 2017

Figure 4: Contribution to Education and Skills Development by IPPs per Province



Source: IPPPP Office, 2017

“No other investment yields as great a return as the investment in education. An educated workforce is the foundation of every community and the future of every economy”
— Brad Henry

Note 1. Values of SED per province includes committed contributions that has not yet been spent.

National Government



NATIONAL ASSEMBLY

NATIONAL COUNCIL
OF PROVINCES
(NCOP)



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, BW1S2 and BW2S2) 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.

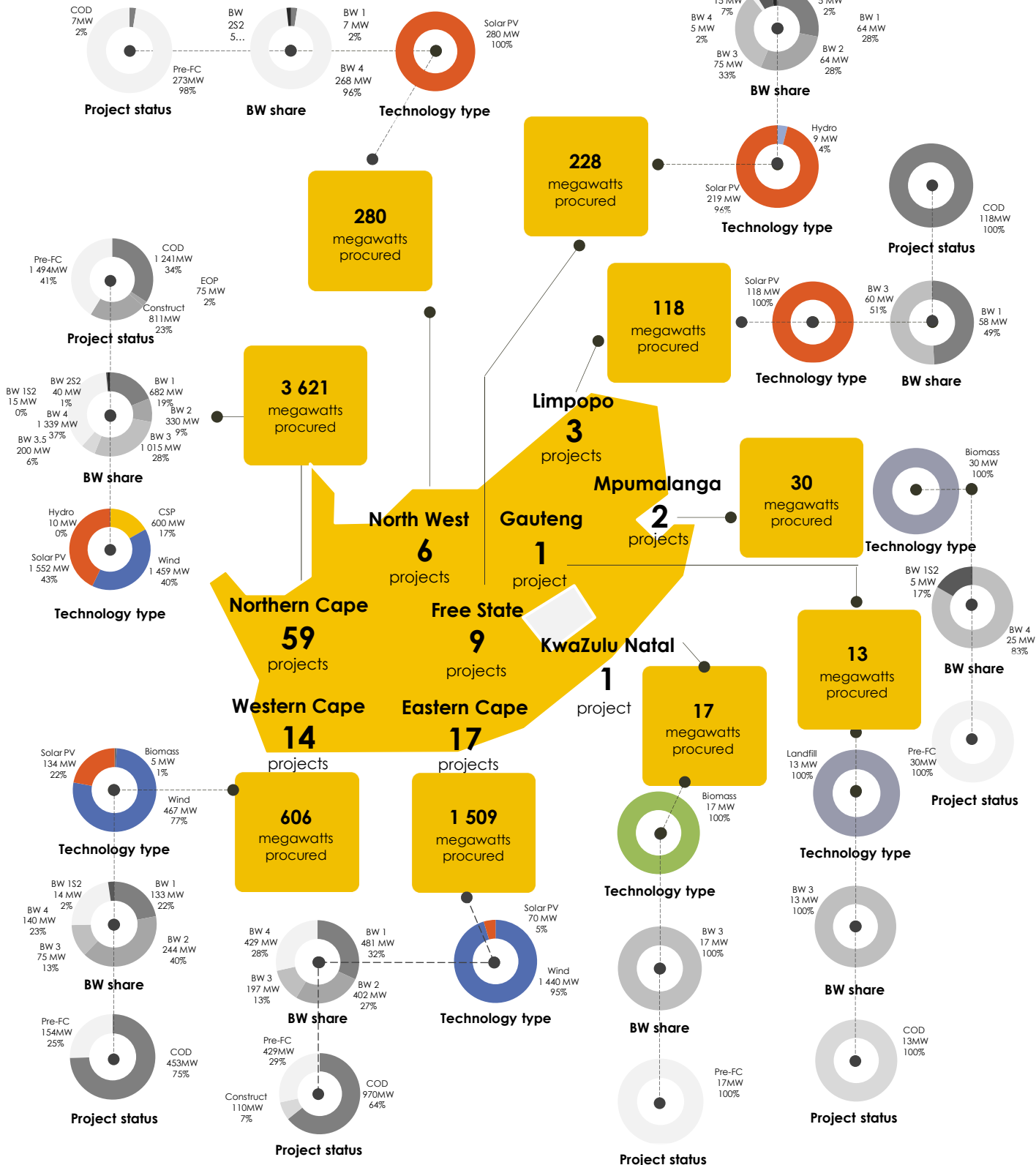
Provincial snapshot

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

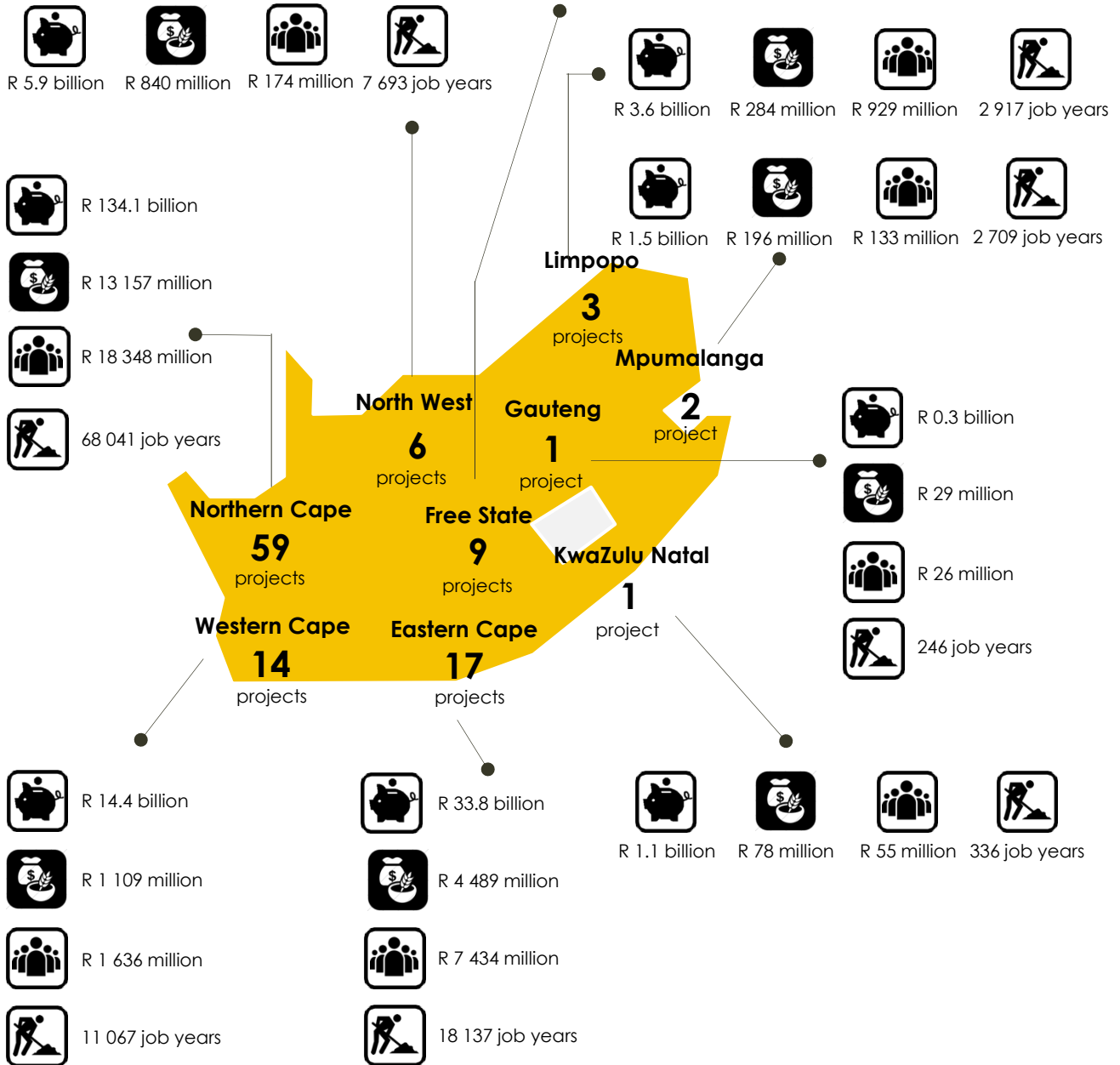
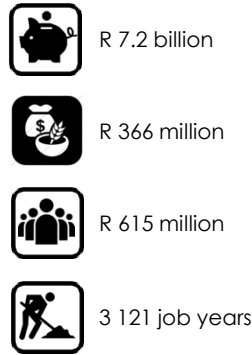
Where: BW | bid window; Pre-FC | before Financial Close; COD | Commercial Operating Period; EOP | Early Operating Period; Construct | Under construction; No GC | Complete No Grid Connection

Note: Capacity shown refers to contracted capacity. To date there has been a variation of 27 MW in the actual operating capacity delivered to the grid on completion. A 13 MW Landfill project in Gauteng has 5 sites with only 1 site (3 MW) having reached COD – this is attributing to 10 MW of the shortfall. The actual operational capacity achieved is shown in the detail on each province.



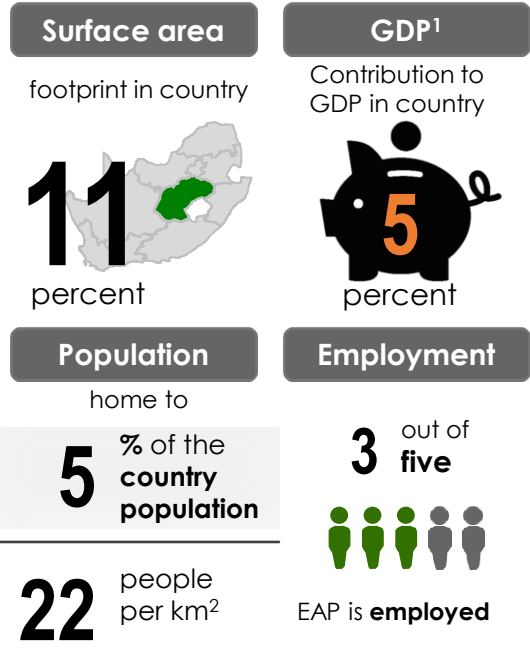
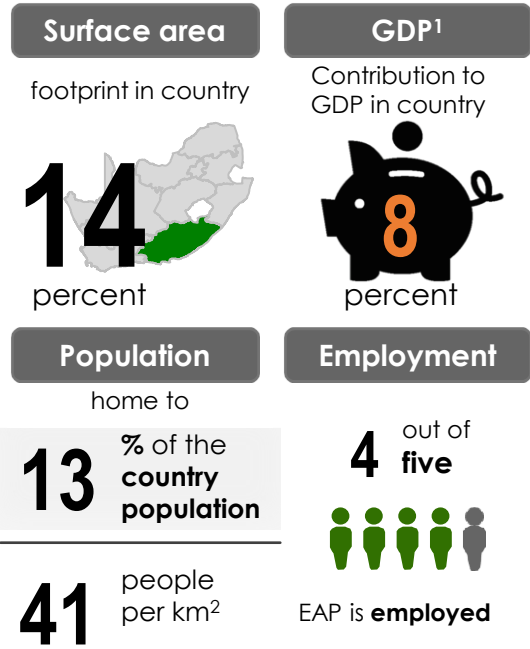
Provincial economic and socio economic development at a glance

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



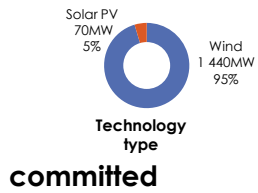
Province • Eastern Cape

Province • Free State



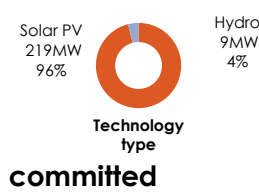
17 projects | 1 509 MW

9 projects | 228 MW



958 MW online⁵
4 489 GWh generated⁴

actual³ (ITD + Q)⁶



125 MW online⁵
697 GWh generated⁴

actual³ (ITD + Q)⁶



Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2015 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.

Province • **Gauteng Province**

Province • **KwaZulu-Natal**

Surface area

footprint in country

1

percent

GDP¹

Contribution to GDP in country

35

percent

Surface area

footprint in country

8

percent

GDP¹

Contribution to GDP in country

16

percent

Population

home to

24

% of the country population

Employment

4 out of five



EAP is **employed**

Population

home to

20

% of the country population

Employment

4 out of five



EAP is **employed**

723

people per km²

115

people per km²

1 project

13 MW



1 project

17 MW



Landfill
13MW
100%



Technology type

committed

3 MW online⁵
0 GWh generated⁴

actual³ (ITD + Q)⁶

Biomass
17MW
100%



Technology type

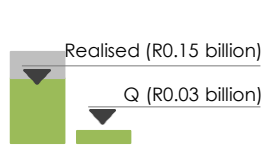
committed

0 MW online⁵
0 GWh generated⁴

actual³ (ITD + Q)⁶



R 0.3 billion²
0.1% of total country

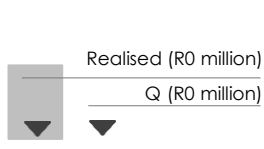


R 1.1 billion²
0.5% of total country

Project in bid window 3 has not commenced



R 29 million²
0.1% of total country



R 78 million²
0.4% of total country

Project in bid window 3 has not commenced



R 26 million²
0.1% of total country

Not reported on a quarterly basis



R 55 million²
0.2% of total country

Not reported on a quarterly basis



246 job years²
0.2% of total country



336 job years²
0.3% of total country

Project in bid window 3 has not commenced

Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2015 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.

Province • Limpopo

Province • Mpumalanga

Surface area
footprint in country
10 percent

GDP¹
Contribution to GDP in country
7 percent

Population
home to
10 % of the country population

Employment
4 out of five
EAP is **employed**

45 people per km²

Surface area
footprint in country
6 percent

GDP¹
Contribution to GDP in country
8 percent

Population
home to
8 % of the country population

Employment
4 out of five
EAP is **employed**

55 people per km²

3 projects | 118 MW 

2 project | 30 MW 

Solar PV
118MW
100%

Technology type

committed


118 MW online⁵
306 GWh generated⁴
actual³ (ITD + Q)⁶

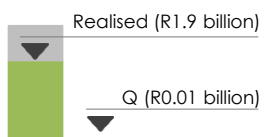
Biomass
30MW
100%

Technology type

committed

0 MW online⁵
0 GWh generated⁴
actual³ (ITD + Q)⁶

 
R 3.6 billion²
2% of total country


Realised (R1.9 billion)
Q (R0.01 billion)

 
R 1.5 billion²
1% of total country

Project in bid window 4 has not commenced

 
R 284 million²
1% of total country


Realised (R14.9 million)
Q (R3 million)

 
R 196 million²
1% of total country

Project in bid window 4 has not commenced

 
R 929 million²
3% of total country

Not reported on a quarterly basis

 
R 133 million²
0.5% of total country

Not reported on a quarterly basis

 
2 917 job years²
3% of total country


Realised (1034)
Q (29)
Job years

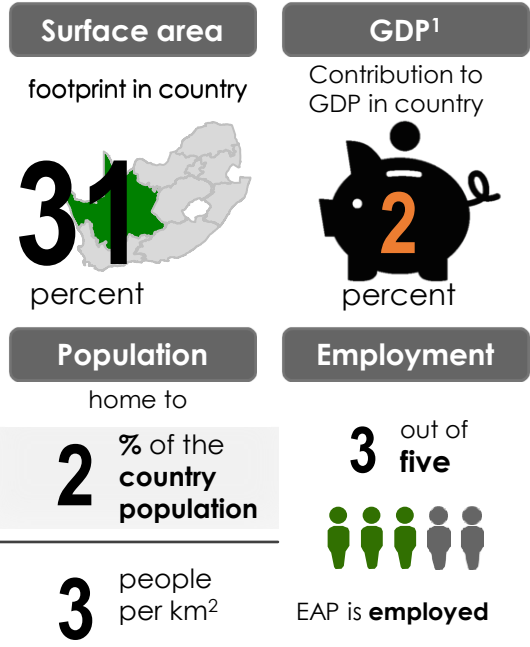
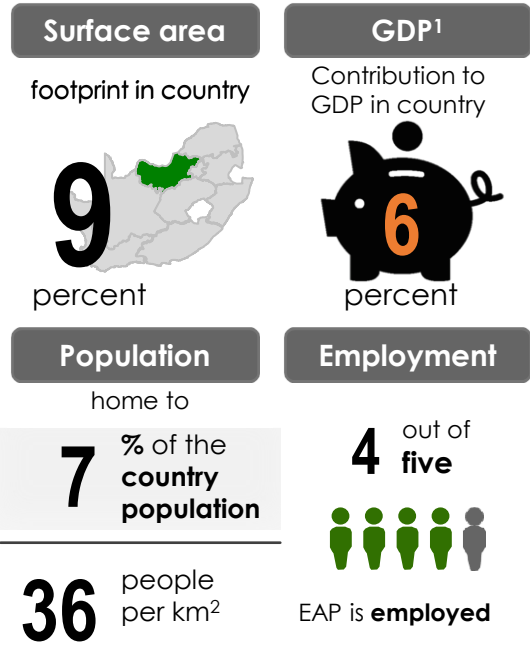
 
2 709 job years²
2% of total country

Project in bid window 4 has not commenced

Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2015 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). BW3 & BW3.5 have been updated from Bid Submission figures to figures as at Financial Close. **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.

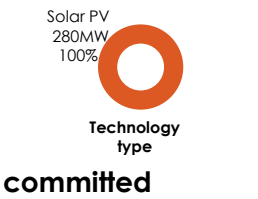
Province • North West Province

Province • Northern Cape



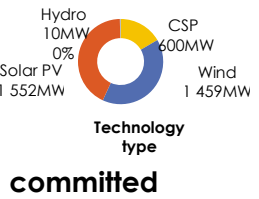
6 projects | 280 MW

59 projects | 3 621 MW



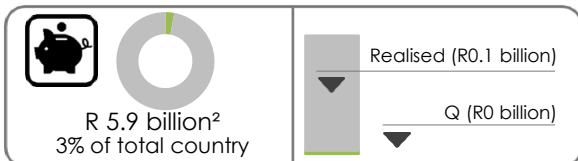
7 MW online⁵
38 GWh generated⁴

actual³ (ITD + Q)⁶



1 239 MW online⁵
5 592 GWh generated⁴

actual³ (ITD + Q)⁶

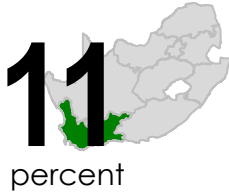


Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2015 Estimates. **Note 2.** IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years). BW3 & BW3.5 have been updated from Bid Submission figures to figures as at Financial Close. **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.

Province • Western Cape

Surface area

footprint in country



GDP¹

Contribution to GDP in country



Population

home to



48 people per km²

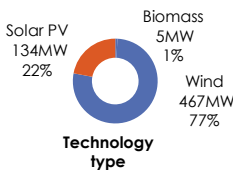
Employment

4 out of five



EAP is employed

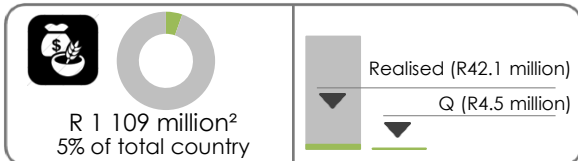
14 projects | 606 MW



452 MW online⁵
1 976 GWh generated⁴

committed

actual³ (ITD + Q)⁶



Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2015 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). BW3 & BW3.5 have been updated from Bid Submission figures to figures as at Financial Close. **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.

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 2019.

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 and BW3.5 (already commissioned or in construction phase, i.e. 4 001 MW) represents approximately 80% towards the 2019 target for capacity commissioned (i.e. 5 000 MW).

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.

- **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 from 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 range 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)

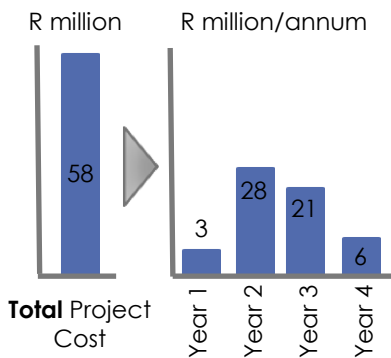
Two important examples are highlighted for clarification:

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



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.

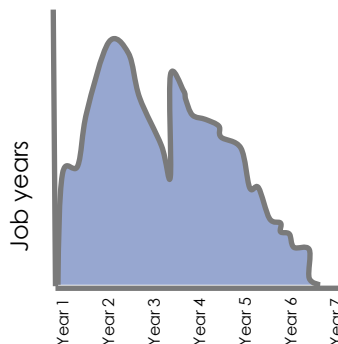
Revenue will also accumulate over 20 years as power is generated and sold. Similarly, development spend (a committed percentage of revenue) and community trust income (percentage of revenue) will accrue over time, starting only after operations have commenced.

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)



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 and 1S2)¹ 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 IPPPP 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.:

$$(R3.10 \times 35\%) + (R1.30 \times 51\%) + (R3.02 \times 13\%) = R2.15/\text{kWh (rounded)}$$

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 consist 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

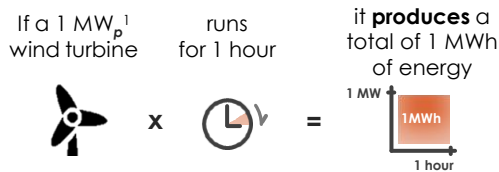
Quarters 1, 2, 3 and 4 are used to refer to quarters of the relevant financial year i.e.:

- 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.



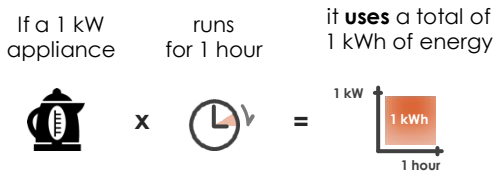
Operational time for different generation technologies vary, depending largely on the availability of the energy resource. For example, wind turbines will only generate power when the wind blows and solar PV plants will only generate while the sun shines.

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.

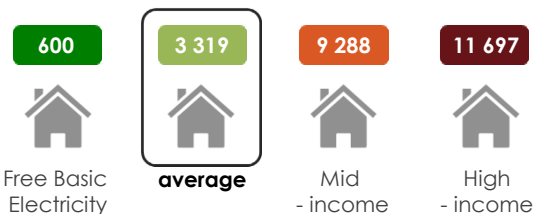
A capacity of 1 MW_p for one technology is therefore not necessarily equivalent in energy output to that of another technology. However, because the availability of energy resources (e.g. sun or wind) also varies in different locations and because operation and maintenance requirements may vary, the 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.

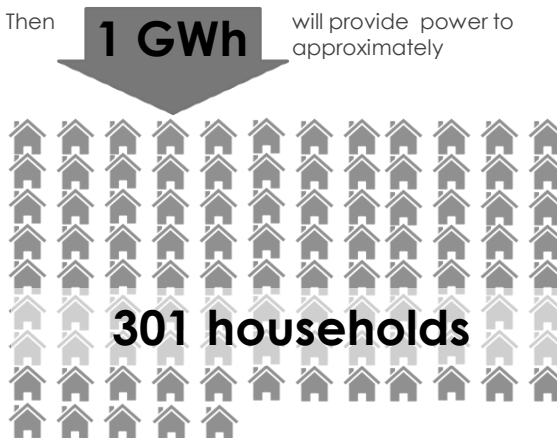


The more appliances a household has and uses, the higher its energy consumption is likely to be. High energy use is therefore typically associated with higher LSM² households. The following scale represents an indicative range of energy use in different South African household types³.

Average annual energy use kWh per annum per household type



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.








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-or-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 REIPPPP 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)

each 1 MW	associated energy GWh	number of homes '000			
		FBE	average	mid - income	high
	3.5	5.9	1.1	0.4	0.3
	3.8	6.4	1.2	0.4	0.3
	2.3	3.8	0.7	0.2	0.2
	6.3	10.5	1.9	0.7	0.5
	7.9	13.2	2.4	0.8	0.7
	5.8	9.7	1.8	0.6	0.5

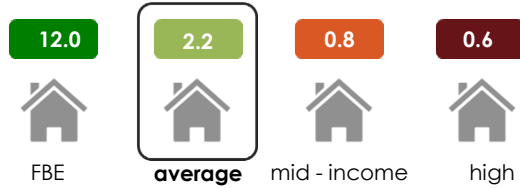
For the portfolio of REIPPPs in BW1 – 2S2 the average capacity factors, as contracted, per technology type, vary from 26% - 90%.

Average¹ capacity factors Percentage per technology type

	40 %		26 %
	44 %		68 %
	90 %		66 %





Energy that will be generated **over a full year of operation**² by those IPPs that are already operational is projected to be 7 183 GWh. This power, that is already available to the system, would be adequate to supply:

Total projected number of households million



This represents 1.5 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)

total installed ³ MW	average annual ⁴ GWh	number of homes '000			
		FBE	average	mid - income	high
 1 360	3 864	6 440	1 164	416	330
 1 325	2 796	4 661	843	301	239
 200	478	797	144	51	41
 14	45	75	14	5	4

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 ~22% and for the portfolio of solar PV plants, a capacity factor of ~19% that have been achieved.

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 27 MW below contracted capacity. **Note 4.** Energy figure understated. Latest quarterly figures not received from some IPPs. To be corrected next reporting period.

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 IPPPP 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 Construction Period.
- **“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, forecast as at the Signature Date, to be incurred up to the Commercial Operation Date by the Seller in the design, construction, development, installation and/or commissioning of the Project.
- **“Total Project Value”** means during the Construction Measurement Period, the capital costs and costs of services procured for the construction of the Facility, excluding Finance Charges, land costs, mobilisation fees to the Operations Contractor and the costs payable to the Distributor, Network Transmission Costs (NTC) and/or a Contractor for the Distribution Connection Works or the Transmission Connection Works (as the case may be).

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)

percent

9 broad economic sectors as defined in the International Standard Industrial Classification (ISIC) and reported on by StatsSA

AGRI



Agriculture

MINING



Mining

MANUF



Manufacturing

ELEC



Electricity

CONSTR



Construction

TRADE



Trade and

TRANS



Transport

FIN



Finance

COMM SERVICES



Community services

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]

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