

Independent Power Producers Procurement Programme (IPPPP)

An Overview

As at 30 June 2021

Executive summary

N91

1

The purpose of this report is to provide an overview of the IPPPP activities for reporting Quarter 1 of the 2021/2022 Financial Year (1 April to 30 June 2021).

Our mandate: Procuring energy while contributing to national development objectives

The Department of Mineral Resources and Energy's (DMRE) **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 electrical power generation capacity. The DMRE, National Treasury (NT) and Development Bank of Southern Africa (DBSA) established the IPP Office for the purpose of delivering on the IPPPP objectives. In May 2016, a new Memorandum of Agreement (MoA) was agreed by all parties to provide the necessary support to the IPP Office to implement the IPPPP for a further 3-year period. This MoA was subsequently extended to 2023.

The **primary mandate** of the IPP Office is **to secure electricity from renewable and non-renewable energy sources from the private sector**. Energy policy and supply is, however, 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 development objectives**, such as job creation, social upliftment, local industry development and increasing opportunities for economic ownership.

The Integrated Resource Plan for electricity (IRP) provides South Africa's long-term plan for electricity generation. It primarily aims to ensure security of electricity supply, minimise the cost of that supply, limit water usage and reduce greenhouse gas (GHG) emissions, while allowing for policy adjustment in support of broader socio-economic developmental imperatives. The IRP 2019 was promulgated in October 2019² and replaced the IRP 2010 as the country's official electricity infrastructure plan.

It calls for 37 696 MW³ of new and committed capacity to be added between 2019 and 2030 from a diverse mix of energy sources and technologies as ageing coal plants are decommissioned⁴ and the country transitions to a larger share of renewable energy. By 2030, the electricity generation mix is set to comprise of 33 364 MW (42.6%) coal, 17 742 MW (22.7%) wind, 8 288 MW (10.6%) solar photovoltaic (PV), 6 830 MW (8.7%) gas or diesel, 5 000 MW (6.4%) energy storage, 4 600 MW (5.9%) hydro⁵, 1 860 MW (2.4%) nuclear and 600 MW (0.8%) concentrating solar power (CSP). Additionally, a short-term gap at least 2 000 MW is to be filled between 2019 and 2022, thereby further raising new capacity requirements, while distributed or embedded generation for own-use is positioned to add 4 000 MW between 2023 and 2030. The IRP is intended to be frequently updated, which could impact future capacity allocations from various energy sources and technologies.

The execution of the IRP is informed by Ministerial determinations, made by the Minister of Mineral Resources and Energy in accordance with section 34 of the Electricity Regulation Act No.4 of 2006 (i.e. new generation capacity). Once released and concurred with by the National Energy Regulator of South Africa (NERSA), the determinations signify the start of a procurement process and creates certainty for investors. Ministerial determinations made in accordance with the IRP 2010 has expired (apart from capacity procured under the IRP 2010 to date). New determinations for the continued procurement of energy from IPPs under the IPPPP in fulfilment of the capacity allocations in the IRP 2019 has been promulgated. In July 2020 the first determination under the IRP 2019, for the procurement of various technology solutions to close a 2 000 MW gap between 2019 and 2022, was gazetted. A second determination, for the procurement of 11 813 MW⁶ new generation capacity, was promulgated in September 2020.

Note 1. Notation indicates additional notes and observations available in Appendix A. **Note 2.** Published in Government Gazette No. 42784 vol. 652 of 18 October 2019. **Note 3.** Excluding Koeberg nuclear plant life extension, a 2 000 MW gap to be filled between 2019 and 2022 and distributed/embedded generation capacity allocations for own use. **Note 4.** Coal-fired generation capacity of 11 017 MW is planned to be decommissioned by 2030. **Note 5.** 2 500 MW imported hydro is planned by 2030 to facilitate the Grand Inga Hydropower Project Treaty between South Africa and the Democratic Republic of Congo (DRC). **Note 6.** Including 6 800 MW solar PV and wind capacity for 2022 to 2024, 513 MW energy storage for 2022, 3 000 MW gas for 2024 to 2027 and 1 500 MW coal for 2023 to 2027.

The Department of Mineral Resources and Energy (DMRE) launched the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) on 24 August 2020. The objective of the RMIPPPP is to fill the supply gap, alleviate the medium term electricity supply constraints and reduce the extensive utilisation of diesel-based peaking electrical generators. On 18 March 2021, eight (8) preferred bidders (1 845.76 MW) and 3 eligible bidders (150 MW) were selected and announced at a media briefing. Following successful value for money negotiations, the three eligible bidders were announced as preferred bidders on 1 June 2021. An extension for Financial Close of the RMIPPPP, to no later than 30 September 2021, has been granted.

Salient features of the June 2021 Quarterly Report

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

The report is structured as follows:

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

Quarter highlights

In the Large REIPPPP, 91 of the 92 projects have reached Financial Close. There is still one BW3 project that has not reached financial close. The project has become unviable due to complications with the fuel supply and the DMRE is currently following due process to give effect to the withdrawal of the project from the procurement process. Construction on the remaining BW3.5 project commenced this quarter, and the project's scheduled commercial operation date has been amended. Two (2) BW4 projects started operations this quarter, bringing the total to 17 (out of 26) BW4 projects that have reached commercial operations.

The projects procured under the two Smalls bid windows¹ were still on hold during Q1 2021/22. The Eskom Board decided not to sign power purchase agreements with the projects due to various reasons. The DMRE is reviewing the outcome of the Eskom board meeting and following due governance processes to recommend the cancellation of the programme.

Preparation for future bid windows are underway. During 2021/22, the IPPPP plans to roll-out five bid windows (11 813 MW) in line with the second determination under the IRP 2019:

- Renewable Energy BW 5 (the request for proposals was released in April, this quarter) which will procure 2 600 MW (1 600 MW from Wind and 1 000 MW from PV);
- Gas to Power Bid Window which will procure 3 000 MW from gas;
- Battery Storage Bid Window which will procure 513 MW from energy storage solutions (ESS);
- Renewable Energy BW 6 which will procure 2 600 MW (1 600 MW from Wind and 1 000 MW from PV).
- Coal Bid Window which will procure 1 500 MW from clean coal technologies.

Note 1. Smalls BW1 and Smalls BW2 referred to as 1S2 and 2S2 throughout the report).

By the end of June 2021, 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;
- 5 250 MW of electricity generation capacity from 81 IPP projects has been connected to the national grid;
- 62 949 GWh of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational in November 2013. Renewable energy IPPs have proved to be very reliable. Of the 81 projects that have started operations, 68 projects have been operational for longer than a year. The electrical energy generated over the past 12 month period for the 68 projects is 11 957 GWh which is 94% of their annual energy contribution projections (P50)³ of 12 690 GWh over a 12 month delivery period. Twenty nine (29) of the 68 projects (43%) have individually exceeded their P50 projections.

Investment, economic, social and environmental impacts:

- Investment (equity and debt) to the value of R209.7 billion was attracted in seven bid rounds²;
- Created 60 517 job years⁴ for South African citizens to date;
- Socio-economic development contributions of R1.6 billion to date, of which R76.7 million was spent in this reporting quarter;
- Enterprise development contributions of R484.1 million to date, of which R20.6 million was spent in this reporting quarter;
- Carbon emission reductions⁵ of 63.9 Mton CO₂ has been realised by the programme from inception to date, of which 3.2 Mton in this reporting quarter;
- Water savings⁶ of 75.5 million kilolitres has been realised by the programme from inception to date, of which 3.8 million kilolitres in this reporting quarter.

Caveat. This report and all analysis include all data reported by IPPs for quarter 1 of 2021/22 FY, as received by 26 July 2021. Any data updates from IPPs after this date will be incorporated and reflected in subsequent reporting periods.

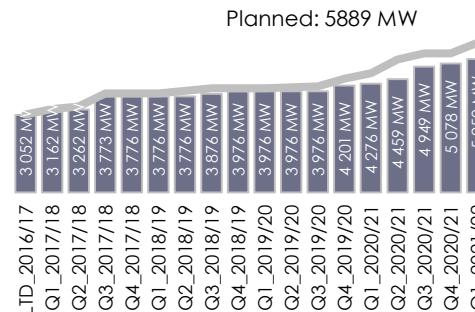
Note 1. 6 422 MW from 92 large scale RE + 99 MW from 20 small scale RE IPPs. **Note 2.** Bid windows 1, 2, 3, 3.5, 4 and smalls BW1 (1S2) & smalls BW2 (2S2). **Note 3.** Projected annual energy contribution - refer to explanatory notes at end of this report for the definition. **Note 4.** The equivalent of a full time employment opportunity for one person for one year. **Note 5.** Carbon emission reduction is calculated based on a displacement of power, from largely coal-based to more environmentally friendly electrical energy generation, using a gross Eskom equivalent emissions factor of 1.015 tons CO₂/MWh. **Note 6.** Based on an estimated water use factor of 0.2L/kWh compared to a water use factor of 1.4L/kWh for Eskom fleet.

REIPPPP highlights

Successfully delivering clean energy timeously and cost effectively

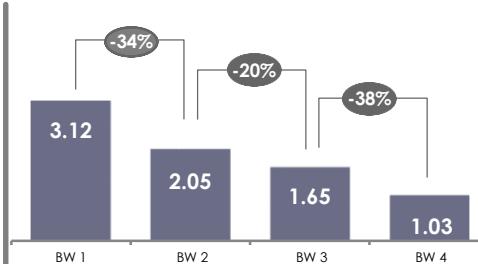
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megawatts operational (MW)



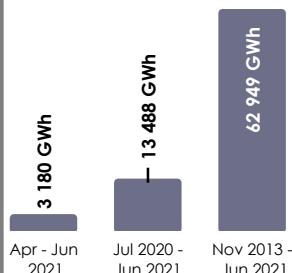
REIPPs have consistently contributed new capacity to the network since the end of 2013. As at **June 2021**, **92%** of IPPs scheduled¹ to be operational have started commercial operations. The average lead time for these 81 projects to be completed has been **2.0 years**.

portfolio price trend² (R/kWh)



Note: REIPPPP prices expressed in April 2021 terms

clean energy generated³ (GWh)

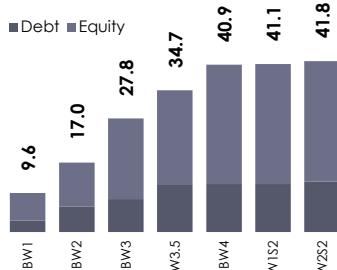


A total of **62 949 GWh** have already been generated by the RE portfolio to date (with 10 projects still in construction) - thereby offsetting **63.9 Mton CO₂ emissions** and realising **water savings of 75.5 million kilolitres⁴**.

Through the **competitive bidding process** the IPPPP effectively leveraged rapid, global technology developments and price trends, buying clean energy at lower and lower rates with every bid cycle, resulting in **SA getting the benefit of RE at some of the lowest tariffs in the world**. The estimated, average portfolio cost for all technologies under the REIPPPP has dropped consistently in every bid period to a combined average of **R1.03/kWh in BW4**. Indications are that prices will continue to decrease in future rounds.

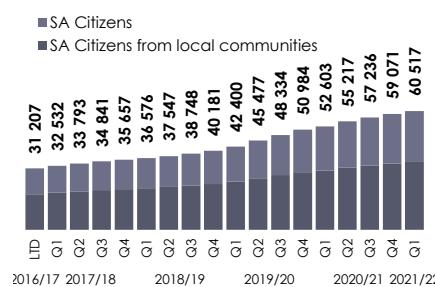
...and is supporting broader development objectives

total foreign investment (cumulative) attracted



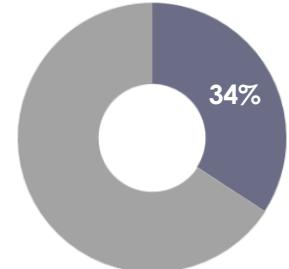
The **total foreign equity and financing** invested in REIPPs (BW1 - BW4, 1S2 & BW2S2) was **R41.8 billion** (of R209.7 billion total investment) by June 2021.

employment creation³ (job years)⁵



RE generation plants are capital intensive and technologically advanced. **60 517 direct Job Years (68 674 FTEs⁶)** created for South African citizens by June 2021, including people from communities local to the IPP operations. Of these jobs 47 212 (78%) were created during construction and 13 305 (22%) in the operational phase of the projects. **65 605 Total job years (74 448 FTEs)** created in total by the programme to date of which **46% is for the youth**.

equitable shareholding (%)³



Black South Africans hold **34%** of the shares across the complete supply chain (for the 91 projects in BW1, BW2, BW3, BW3.5 and BW4). **Local communities hold 8% equity** in the IPPs of BW1, BW2, BW3, BW3.5 and BW4.

Note 1. 81 projects have started operations out of 88 that were planned by June 2021. **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 2021 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, BW3.5 and BW4 projects. Projects which have not completed financial close - 1 BW3 project (financial close unlikely as the project has become unviable due to complications with the fuel supply; the DMRE is currently following due process to give effect to the withdrawal of the project from the procurement process). BW1S2 & BW2S2 (The DMRE is following due governance processes to recommend the cancellation of the programme). **Note 4.** Carbon emission reductions reflect all energy generated inception to date. Water savings calculated based on an estimated water use factor of 0.2L/kWh compared to a water use factor of 1.4L/kWh for Eskom fleet. **Note 5.** Employment / Job creation measured in job years (equivalent of a full time employment opportunity for one person for one year - refer to Annexure B, for full definition). **Note 6.** Person months (reporting unit of IPP agreements) converted to FTEs as per EPWP definition - refer to Annexure B, for full definition.

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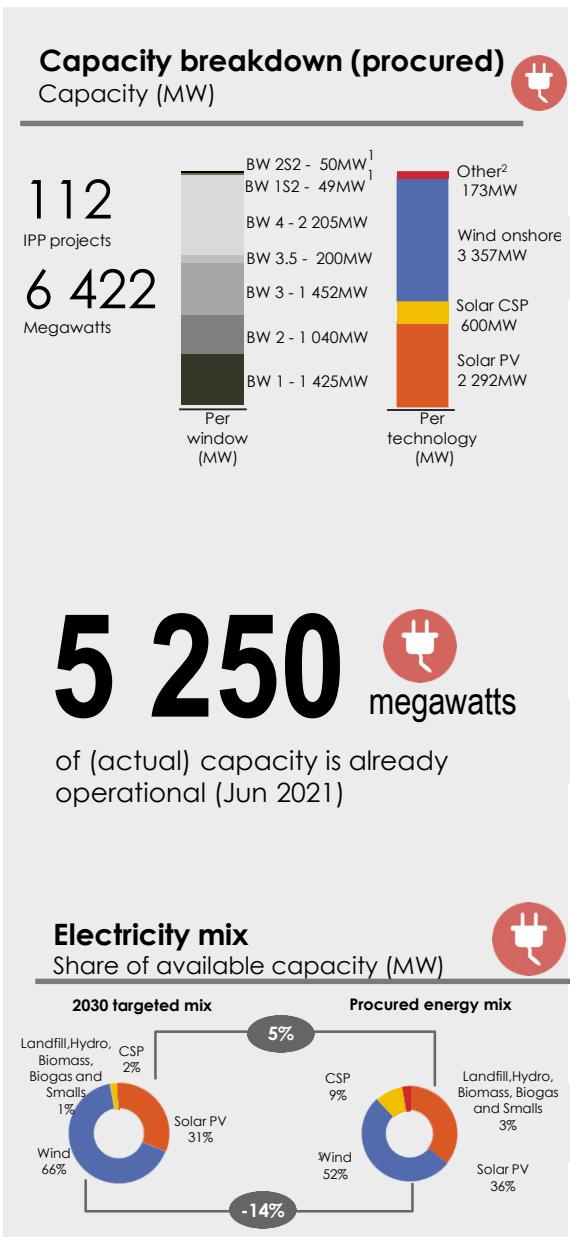
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The REIPPPP contribution:

Energy supply
capacity impact

The procured portfolio of RE capacity



The REIPPPP procurement mandate

The IRP 2019 proposes the energy mix with which to meet the country's electricity needs to 2030. The IRP put forward that 14 400 MW (45.7% of total new capacity by 2030) be procured from Wind, and 6 000 MW (19.1% of total new capacity by 2030) from Solar photovoltaic (PV).

Ministerial determinations give effect to the procurement process and implementation of the relevant capacity allocations of the IRP³.

Before the promulgation of the new determinations, the REIPPPP has successfully procured 6.4 GW from 112 IPPs in BW1 to BW4, 1S2¹ and 2S2¹. Of this, 6.3 GW (from BW1, BW2, BW3⁴, BW3.5 and BW4) are at various stages of construction or have commenced with commercial operation.

By end June 2021, 5 276 MW of the procured capacity started operations and delivered 5 250 MW of actual capacity (i.e. 81 IPPs delivering 26 MW short of procured capacity).

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 solar is higher than planned, with the wind share 14% lower in the current mix. The slight divergence from the IRP 2019 is informed by technology, price and system requirements.



Note 1. 1S2 & 2S2 refers to Smalls BW1 and Smalls BW2 respectively. The DMRE is currently following due governance processes to recommend the cancellation of the programme. **Note 2.** The 173 MW Actual (Procured) for landfill gas, hydro, biomass and biogas includes small projects of 99MW. **Note 3.** The second determination under the IRP 2019, as promulgated in September 2020, makes provision for the procurement of 6 800 MW of new generation capacity from wind and solar IPPs. **Note 4.** 16 of 17 BW3 have reached financial close. The remaining project has become unviable due to complications with the fuel supply. The DMRE is currently following due process to give effect to the withdrawal of the project from the procurement process.

REIPPPP estimated¹ price trends

Energy weighted average (R/kWh)



Note: REIPPPP prices expressed in April 2021 terms

Average technology tariffs²

R/kWh for large RE projects



Average

Per bid window

N8



1.21

-50%

1.88 1.47 1.08 0.94



3.18

-7%

4.41 4.12 2.40 2.23

Ave of base rate only



2.27

-75%

4.52 2.70 1.45 1.14



1.66

-8%

1.69 1.55



2.02

-2%

2.05 2.01



1.37

1.37

Average technology tariffs²

R/kWh for small RE projects



Per technology



1.73



1.43



1.52



2.05

1.25

Cost effectiveness of the REIPPPP (Actual bid prices)

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

Energy procured by the REIPPPP is progressively more cost effective with the **estimated**, average portfolio¹ cost for all technologies under the REIPPPP dropping consistently in every bid period to a combined average of R1.03/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 R0.94/kWh, while Solar PV has dropped with 75% to R1.14/kWh between BW1 and BW4.

CSP rates in BW3 and BW3.5 were differentiated with a base and peaking rate component and are therefore indicated separately in the diagram to the left. The average rate of CSP decreased by 7% to R4.12/kWh between BW1 and BW2 and by 8% to R2.23/kWh from BW3 to BW3.5 (average base rate)³.

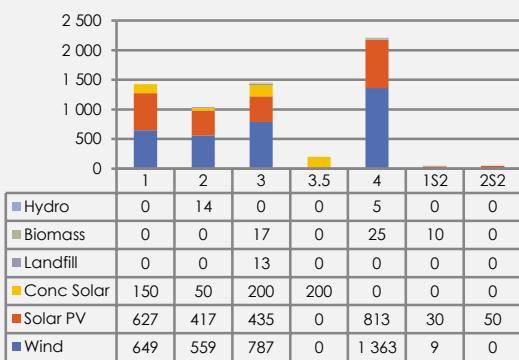
The average rate per technology type for the small projects are shown at the bottom to the left. The first small scale renewable energy bid window has been procured at an average price of R1.73/kWh (in April 2021 terms). As anticipated, the cost of small scale projects are higher than that of large projects. The second small scale renewable bid window has been procured at an average price of R1.25/kWh for solar PV projects. As anticipated, this is significantly lower than the first small bid window, and a similar downward price trend, as with the large projects, has been realised.

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

Note 1. Contracted (at which power is sold to Eskom) price (in 2021 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 2. Fully indexed price, inflation adjusted (2021). Note 3. The peaking rate is 270% of the base rate (i.e. an average of R5.82/kWh for BW3 and 3.5).

Technology capacity procured

Per technology per bid window (MW)



Procured vs operational

Capacity Per technology (MW)

Procured:

3 357 MW

Of which **75%** is operational

Procured 3 357 MW Operational 2 513 MW

600 MW

Of which **83%** is operational

Procured 600 MW Operational 500 MW

2 292 MW

Of which **97%** is operational

Procured 2 292 MW Operational 2 212 MW

74 MW

Of which **35%** is operational

Procured 74 MW Operational 26 MW

99 MW

Of which **0%** is operational

Procured 99 MW Operational 0 MW

Technology contributions

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

New capacity is consistently being added to the network, from the respective technologies.

To date, 82% (i.e. 5 250 MW) of the total procured capacity of 6 422 MW (including 99 MW for Small projects) has been added to the network.

At the end of June 2021, 3 357 MW of wind capacity has been procured, of which 2 513 MW (75%) is operational.

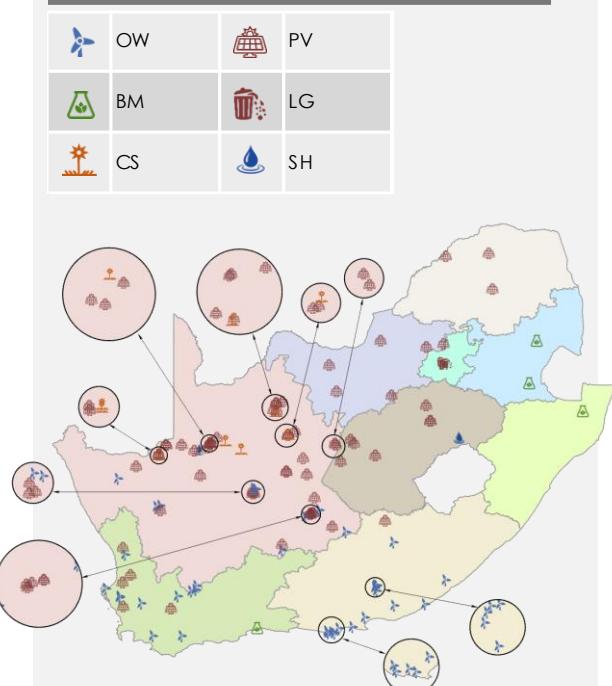
A total of 600 MW of capacity for CSP has been procured, with 500 MW (83%) already online.

Capacity online from solar PV (2 212 MW) has reached 97% of the 2 292 MW procured.

Only 35% (26 MW) of the 74 MW procured from small hydro, landfill gas, and biomass have started operations to date.

For small scale renewable energy projects 99 MW have been procured under the two bid windows for small projects. The 99 MW include 80 MW from solar PV, 9 MW from wind power and 10 MW from biomass. These projects have not yet reached financial close. The DMRE is currently following due governance processes to recommend the cancellation of the programme after the Eskom board decided not to sign PPAs with the projects.

Project Distribution



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 projects¹. Solar projects are concentrated in the Northern Cape where the radiation intensity in the country is the highest. As a result, the Northern Cape has received the bulk of the projects (59 of 112 in BW1, BW2, BW3, BW3.5, BW4, 1S2 and 2S2) and should see the benefit from the significant associated investments and the socio-economic commitments that have been secured for local communities through the procurement process.

Refer

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for detailed provincial distribution information

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 Natal². Mpumalanga's first project was awarded in BW4.

Refer

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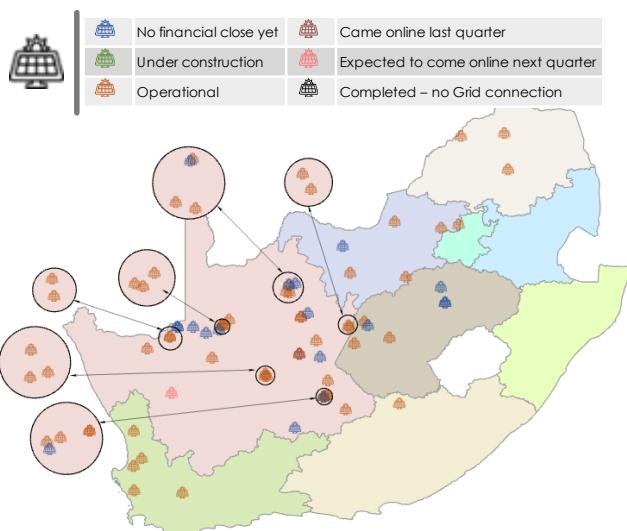
for details on technology capacity factors

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.

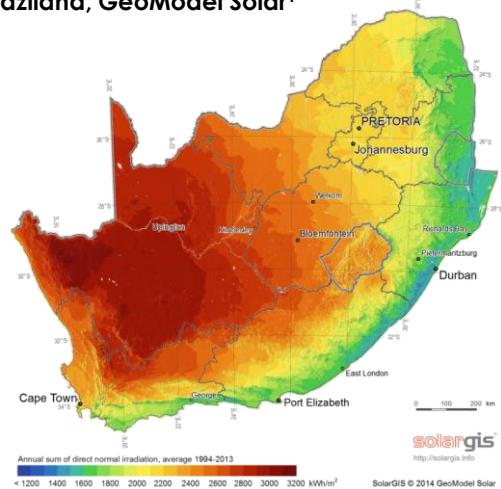
Note 1. 20 of the 112 projects were procured under the Smalls programme, which could possibly be cancelled. **Note 2.** The BW3 project in KwaZulu-Natal has become unviable due to complications with the fuel supply. The DMRE is currently following due process to give effect to the withdrawal of the project from the procurement process.

Technology distribution

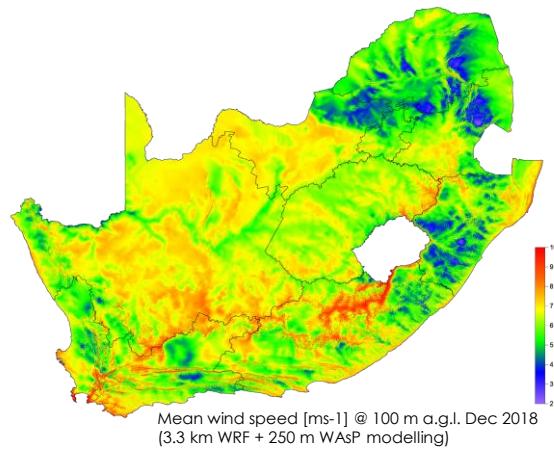
The geographical distribution of projects is largely based on favourable resource conditions, in particular solar radiation and wind flows throughout the year, as illustrated below.



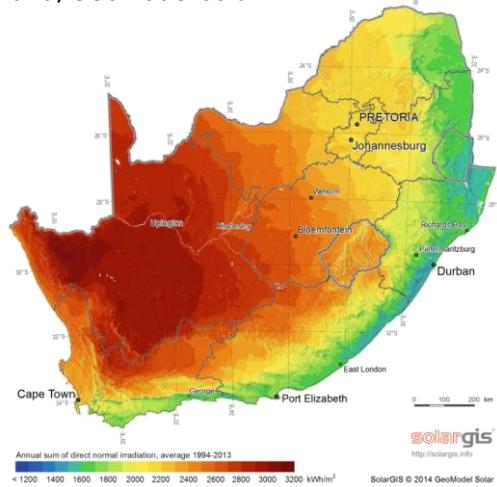
Solar maps for South Africa, Lesotho and Swaziland, GeoModel Solar¹



Wind Atlas of South Africa (WASA), Large Scale High Resolution Wind Resource map, Dec 2018



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 30 June 2021)

The status of the combined portfolio of the 112 IPP projects procured in BW1 - BW4, 1S2¹ and 2S2¹ is:

- There are **91 active² projects** of which **81 projects** are **in operation** and have added **5 250 MW generation capacity** to the national grid. Since the first plant became operational **62 949 GWh of renewable energy has been generated**.
- All **28 projects** in BW1 and **19 projects** in BW2 have **reached COD**.
- Of the **17 projects** from BW3, **16** have reached COD and have a total generation capacity of **1 428 MW**. The **remaining project** has become unviable due to complications with the fuel supply, and the withdrawal of the project from the procurement process is being considered.
- Of the **2 projects** in **BW3.5**, **1** is in **operation** while **1** started **construction** this quarter. The scheduled commercial operation date (SCOD) for the project has been extended.
- **Seventeen (17) projects** in **BW4** is in **operation**. The remaining **9 projects** are still **in, or entering, construction**.
- The **Small projects - BW1 (1S2) (10 projects)** and **BW2 (2S2) (10 projects)** are **on hold**. The Eskom Board decided not to sign power purchase agreements with the projects due to various reasons. The DMRE is reviewing the outcome of the Eskom board meeting and following due governance processes to recommend the cancellation of the programme.

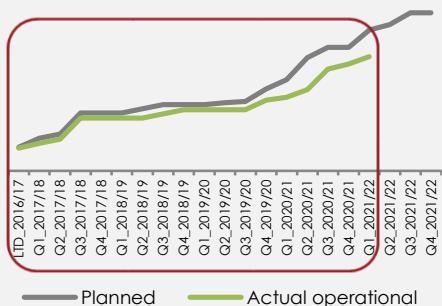


REIPPPP operational capacity

Capacity



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



Operational capacity



Of the **91 active² projects**, **81** have successfully completed construction. The average construction lead time for operational projects has been 730 days (~2.0 years).

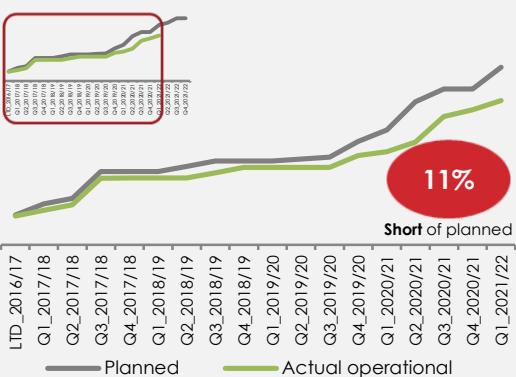
Based on scheduled commissioning dates and progress to date, it is projected that all projects in BW4 will be operational by 29 October 2021. The SCOD for the remaining BW3.5 project has been amended to 31 October 2023.

5 889 MW (from 88 projects) was originally scheduled to be operational by end of June 2021, with 5 250 MW realised (from 81 projects). 89% of the scheduled capacity has been achieved, with a 639 MW shortfall from the capacity originally scheduled, by the end of this period³.

Note 1. 1S2 and 2S2 refers to Smalls BW1 and BW2 respectively. The DMRE is currently following due governance processes to recommend the cancellation of the programme. **Note 2.** Projects which have reached financial close. **Note 3.** The 7 projects that have not started operations as originally scheduled are contributing 615 MW to this shortfall, while only 24 MW is attributed to under delivery against contracted capacity as at financial close.

REIPPPP operational capacity

Capacity

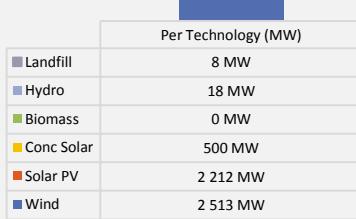


The **delayed BW3 project (16.5 MW) has become unviable** and due process is being followed to give effect to the withdrawal of the project from the procurement process.



Operational capacity

Per technology (MW)



For most of the preceding quarters since the first IPP started operation, **actual** commercial operation dates tracked the planned or scheduled dates rather closely (refer to extract of the tracking graph on the left).

At the end of June 2021, 81 projects (92%) out of 88 originally scheduled to be operational had reached COD. The IPPs in operations delivering below their contracted capacity are resulting in a shortfall of 26 MW¹.

The average time delay between actual and scheduled COD for IPPs **in operation** was 81 days i.e. ~2.6 months. BW1 and BW2 projects were, on average, 89 and 79 days delayed, respectively, as a result of delays in grid connections and the extended **industrial action** in the metals and mining industries early in 2014. The average time delay between the actual and scheduled COD, for the 16 BW3 projects were 7 days, 130 days for the BW3.5 project that reached financial close in July 2019, and 135 days on average for the 17 operational BW4 projects. The delays for BW3.5 and BW4 projects are partly ascribed to delays in concluding PPAs of the projects with Eskom, between the time of procurement and April 2018 and also the construction delays as a result of COVID-19.

There are 10 IPPs still in, or entering, construction. At the end of the reporting quarter, 5 of these projects (482 MW) were delayed based on their latest SCOD (this excludes the delayed BW3 project, that have not yet reached financial close).

Most projects were on course to reach COD on their scheduled date without delays.

Two BW4 projects started operations this quarter. The remaining 9 projects that have reached financial close should be completed by 29 October 2021, while the BW3.5 project that commenced construction this quarter is now scheduled to reach COD on 31 October 2023.

Operational capacity (5 250 MW) is contributed by Solar PV (2 212 MW), Onshore Wind (2 513 MW), CSP (500 MW), Hydro (18 MW) and Landfill gas (8 MW) technology.

Note 1. Contracted capacity at grid connection, for the 28 BW1 projects, was 1 415 MW against contracted capacity at financial close of 1 425 MW. For the 19 BW2 projects, contracted capacity at grid connection was 1 033 MW against 1 040 MW at financial close. The 16 BW3 projects' contracted capacity at grid connection was 1 428 MW against a contracted capacity of 1 435 MW at financial close (the landfill project with only 3 of 5 sites scheduled to be operational, is contributing 5 MW to this shortfall). The construction of the remaining two sites (2 MW) was terminated, following an exemption granted by the Department in December 2019. The contracted capacity for the 17 BW4 projects in operation was 1 276 MW at grid connection, against contracted capacity at financial close of 1 275 MW.

Average delivery lead time

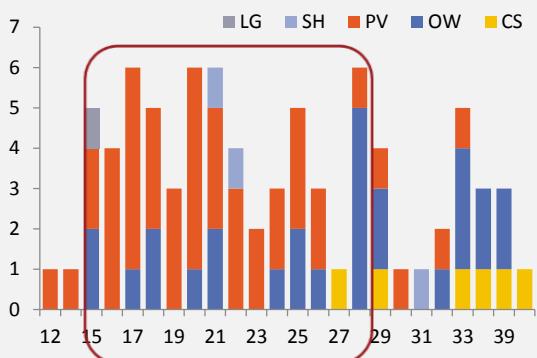
Years

2.0
years

average lead time for
delivering 5250 MW
operational capacity

Distribution of lead times

Construction (in months) for completed
projects



Energy supplied to grid

Energy generated (GWh)²



Percentage of energy generated

Percentage

86
percent

of projected (P50)
annual generation
achieved from the 81
operational plants

Construction duration

As indicated previously, despite delays, the average construction lead time for the current portfolio is 730 days i.e. 5 250 MW generation capacity was delivered within 2.0 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 (59 of 81) took between 15 and 28 months to be constructed. The cluster of projects that were completed in the 15 – 28 month timeframe, delivered 3 572 MW, representing 68% of the 5 250 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 their shortest lead time being 27 months. Otherwise, as expected, this analysis confirms that significant renewable capacity can be brought online within a short timeframe.

Energy supplied

The first IPP reached COD, supplying power to the grid, in November 2013. Since inception¹, 62 949 GWh of energy has been generated, by renewable energy sources, from the 81 projects that are operational. Of this energy, 3 180 GWh was generated during this reporting quarter, which is 11% less than the 3 531 GWh generated in the previous quarter.

The energy generated over the last 12 months (July 2020 – June 2021), from operations by the 81 projects that have reached COD, was 13 488 GWh.

- This 13 488 GWh represents 86%² of the annual projected energy production by all the operational IPPs (P50³ for the 81 operational IPPs is 15 743 GWh).
- The average operational period of the current portfolio of the 79 IPPs is 1 762 days (approximately 57.8 months).
- All the 47 BW1 and BW2 projects are in operation and have generated 6 478 GWh over the last 12 months. This equates to 94% of their combined annual projected energy production (P50³) of 6 878 GWh.

Note 1. Total renewable energy generated by the IPPs since the first project became operational. **Note 2.** Not all plants were operational for a year hence the figure is understated. **Note 3.** Refer to explanatory notes at end of this report for the definition.

Percentage of energy generated

Percentage

102 percent of projected (P50) annual generation achieved from **solar PV** plants operational for **more than 12 months**

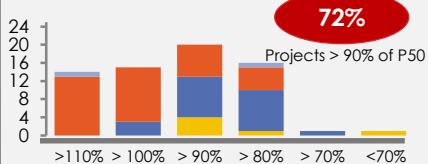
Achievement of P50¹ projections

No. of projects

Projects in COD > 1 year



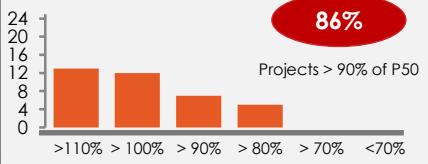
68



72%



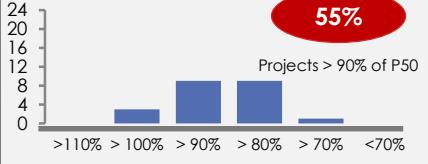
37



86%



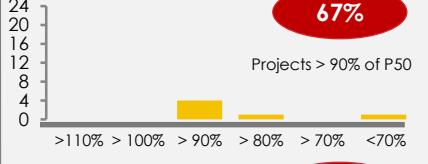
22



55%



6



67%



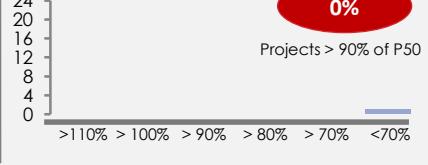
2



50%



1



0%

Of the 81 projects that have started operations, 68 projects have been operational for longer than one year. The energy generated over the past 12 month period for these 68 projects is 11 957 GWh, which is 94% of their P50¹ projections of 12 690 GWh over a 12 month delivery period.

Twenty-nine (29) of 68 projects (43%) have individually exceeded their P50¹ projections, while 72% of the projects achieved greater than 90% of P50. These are for solar PV, onshore wind, CSP, and small hydro projects².

- Solar PV: The majority of operational IPPs are solar PV plants. Thirty seven (37) projects, with this technology, have been operational for more than 1 year, and have generated 4 071 GWh over the past 12 month period, which exceeds their P50¹ projections of 4 002 GWh by 2%. Individually, 25 of these 37 PV projects (68%) have exceeded their P50¹ projections, while 32 (86%) of the IPPs achieved greater than 90% of their P50¹ projection. Thirteen (13) projects have exceeded 110% of their target. Five (5) projects fell short of achieving greater than 90% of their P50¹ projections.
- Onshore wind: 22 projects using onshore wind technology have been operational for more than 1 year, and these IPPs have generated 6 111 GWh over the past 12 month period, which falls short of their total P50¹ projections, of 6 660 GWh, by 8%. Individually, while 3 of these 22 wind projects (14%) have exceeded their P50¹ projections, 55% of the IPPs achieved greater than 90% of their P50¹ projections. Ten (10) projects fell short of achieving greater than 90% of their P50¹ projections.
- CSP: Six (6) projects have been in operation for more than 12 months, of which 67% have generated over 90% of their P50 projections. These projects generated 1 662 GWh (89%) against a P50¹ projection of 1 861 GWh over the past 12 month period.
- Small Hydro: Two (2) projects have reached COD, and have been operational for more than 12 months. One of the SH projects exceeded 110% of its target.

The landfill gas project have been operational for more than 12 months, but is falling short of achieving greater than 90% of its P50¹ projections³.

Note 1. Refer to explanatory notes at end of this report for the definition. **Note 2.** It should be noted that performance of projects are dependent on the availability of the power source, e.g. in the case of the underperforming Small Hydro project, energy generation could be impacted by the drought experienced in the Northern Cape Province where the project is located. **Note 3.** Only 3 of the 5 sites of the landfill project is operational. The construction of the remaining two sites (2 MW) was terminated, following an exemption granted by the Department in December 2019.



Of the 81 projects that have reached COD, 64 projects have been operational for longer than 24 months. When comparing the 64 projects over the two 12 month periods, the following is noted:

- For Year 1 (July 2019 – June 2020) 11 079 GWh (93%) of the 11 882 GWh P50¹ projection was achieved.
- For Year 2 (July 2020 – June 2021) 11 121 GWh (94%) was achieved against the same P50¹.
- For the 64 projects, individually 49 IPPs (77%) achieved greater than 90% of their P50¹ projection in the first year of operation, and 45 (70%) accomplished this in the second year of operation.

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

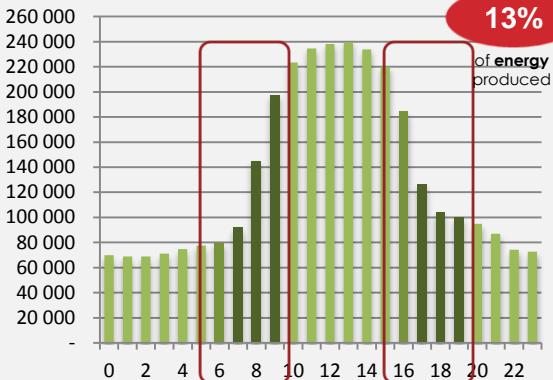
- Solar PV:** Of the 64 projects that have been operational for more than a two year period, 33 are Solar PV. For the time periods, Year 1 and Year 2, these 33 projects generated 3 263 GWh (102%) and 3 235 GWh (101%) respectively against their targeted P50¹ projection of 3 194 GWh. Individually 22 projects (67%) have exceeded their P50¹ projections in Year 1 and in Year 2. In both Year 1 and 2, 28 projects (85%) achieved more than 90% of their P50¹. When comparing the energy generation achieved year on year per project, there has been little variation. Only 2 of the 33 projects showed greater than a 5% difference (increase or decrease year on year).
- Onshore wind:** Of the 64 projects that have been operational for more than a two year period, 22 are Onshore wind. In Year 1 and Year 2 respectively, these 22 projects generated 6 162 GWh (93%) and 6 111 GWh (92%) against their targeted P50¹ projection of 6 660 GWh. Individually, 2 projects in Year 1 and 3 projects in Year 2 exceeded their P50¹ projections, while 18 projects (82%) in Year 1 and 12 projects (55%) in Year 2 achieved more than 90% of their P50¹.

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

Note 1. Refer to explanatory notes at end of this report for the definition.

Hourly energy profile

Q1_2021/22 energy generated (MWh)



Reserve margin¹ contribution

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 (1 April to 30 June 2021) a 13% contribution was made during the morning and evening system **peak periods²** (and 15% since inception up to June 2021).

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

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.** As defined by the Megaflex tariff: 07:00 – 10:00, 18:00 – 20:00 excluding weekends, public holidays.



The REIPPPP contribution:

Investment,
economic, social and
environmental
footprint

Attracting significant investment into the South African economy

Committed investments

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



209.7

Rand billion

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

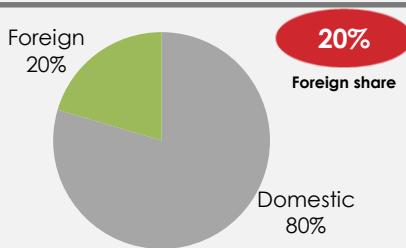
of which

R41.8 billion

from foreign investors and financiers

Foreign equity and financing share

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



Investment attracted

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

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

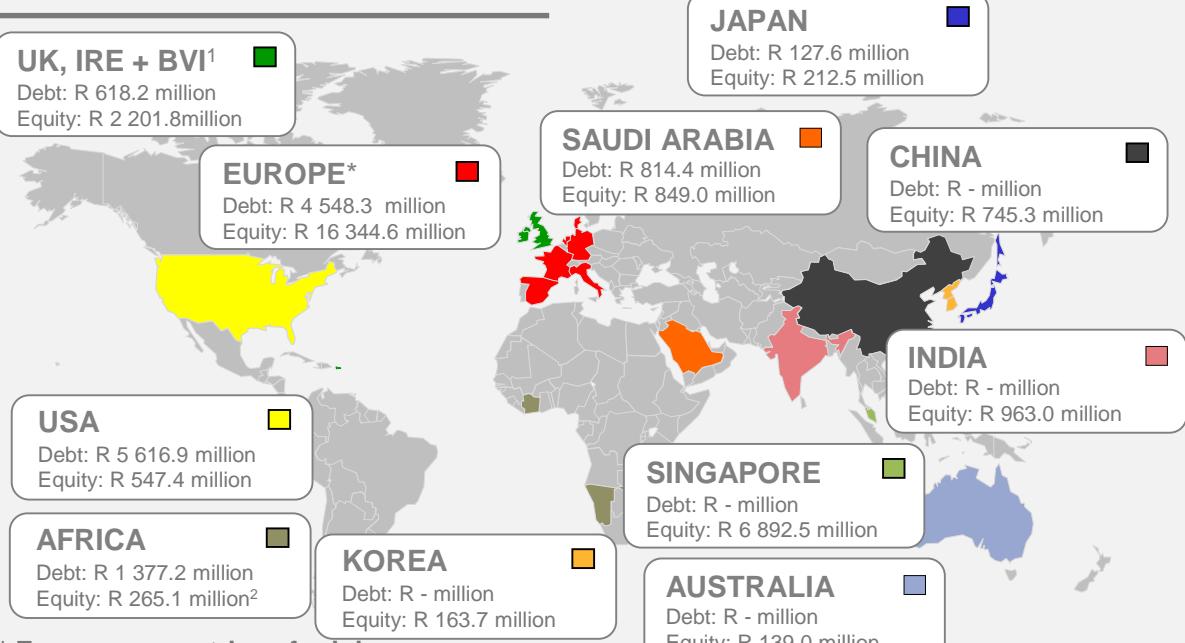
The REIPPPP has attracted R41.8 billion in foreign investment and financing in the seven bid windows (BW1 – BW4, 1S2 and 2S2).

Whilst retaining shareholding for South Africans is a priority, the associated influx of foreign investment and funding is also of significance to the economy as it reflects investors confidence to invest in South Africa instead of another country. Foreign direct investment in South Africa in recent years remained at relatively low levels compared to other emerging market countries. The REIPPPP is one of the only programmes that not only bring foreign expertise to develop renewable energy projects, but also improves the country's balance of payments (international reserves) by offering a fair and transparent mechanism for investors.

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 means the total capital expenditure to be incurred up to the commercial operations date in the design, construction, development, installation and/or commissioning of a project, which is equal to the total debt and equity related to a project as reported at commercial close. **Note 2.** This analysis is based on Financial Close for BW1, BW2, BW3, BW3.5 and BW4, and RFP for 1S2 and 2S2. Note this may result in minor discrepancies with reported numbers elsewhere in the report.

Sources of foreign equity and debt



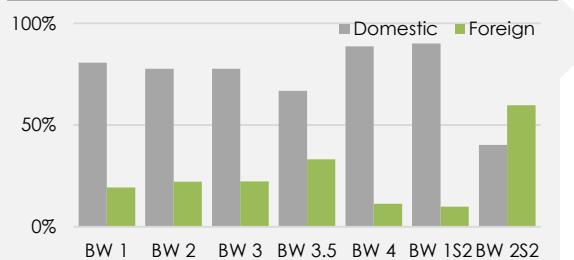
* European countries of origin

Germany | Debt: R 1 717.2 million | Equity: R 652.0 million France | Debt: R 1 250.0 million | Equity: R 286.2 million
 Italy | Debt: R 259.0 million | Equity: R 8 239.1 million Luxembourg | Debt: R 560.0 million | Equity: R 897.9 million
 Netherlands | Debt: R 762.0 million | Equity: R 4 052.7 million Norway | Debt: n/a | Equity: R 734.5 million
 Spain | Debt: n/a | Equity: R 1 482.1 million

[Approximately R 7 051.9 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)



The FDI analysis identified at least 23 different countries, including two from Africa, that have participated in providing financing and/or equity to IPPs.

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

South African citizen shareholding

The importance of retaining shareholding in IPPs for South Africans was recognised and incorporated into the procurement conditions³, requiring that at least 40% of each project should be owned by South African entities with level 5 contributor status.

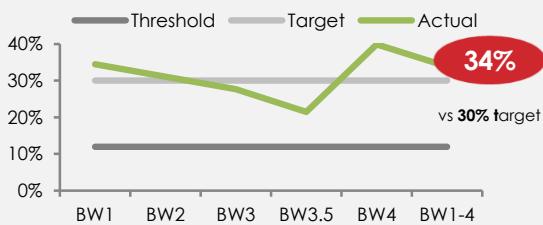
The South African (local) equity shareholding across BW1 to BW4, 1S2 and 2S2 equates to 52% (R31.5 billion) of total equity (R61.0 billion), which is substantially more than the 40% requirement. Foreign equity amounts to R29.5 billion and contributes 48% of total equity.

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

Ownership

Actual % vs target (active projects)¹

Shareholding (Black people total)



Shareholding (Black people in local communities)



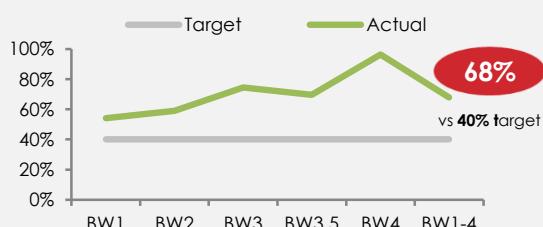
Black shareholding in EPC contractor



Black shareholding in operating company²



Black Top Management



South African debt across BW1 to BW4, 1S2 and 2S2 equates to 91.7% (or R136.4 billion, which includes total debt of R135.8 billion and early revenue and VAT facility of R0.5 billion) of total debt (R148.7 billion). Foreign debt accounts for 8.3% (R12.4 billion) of total debt. Several factors may contribute to local dominance, such as low currency exposure (international lenders may be reluctant to lend to projects that earn revenue in Rands). However, whether firms borrow locally or internationally, IPPs still provide all the funds for the construction and operation of the power plants, bears all the risks of the project, and only start recovering its investment when the power plant starts generating power based on the actual performance of the plant. Lower than anticipated performance will lead to lower than anticipated returns and ability to serve the debt raised (locally or internationally).

The REIPPPP contributes to Broad Based Black Economic Empowerment and the creation of black industrialists. Black South Africans own, on average, 34% of projects that have reached financial close (i.e. projects in BW1 – BW4¹), which is 4% higher than the 30% target. This includes black people in local communities that have ownership in the IPP projects that operate in or nearby their vicinities, and represents the majority share of total South African Entity Participation.

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

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

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

Furthermore, shareholding by black people in operating companies of IPPs has averaged 28% (against the targeted 20%) for the 81 projects in operation (i.e. in BW1 – 4).

The target for black people in top management has been set at 40%, with an average 68% achieved to date.

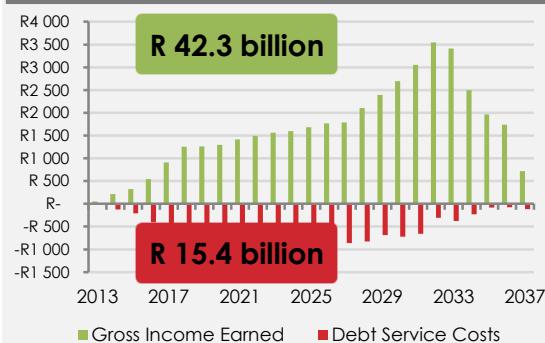
Refer
Page
A8 & A9

for detail of
the targets
and
thresholds
across bid
windows.

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

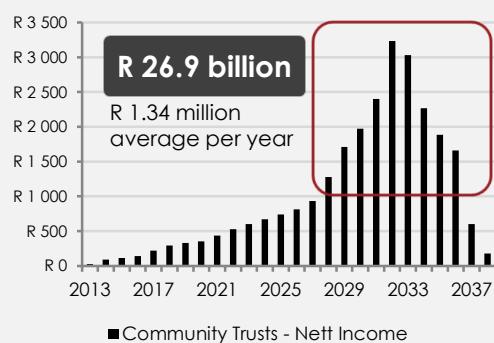
Community trusts | Income and costs^{1,2,3}

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 has been structured through the establishment of community trusts. For projects in BW1 to BW4, 1S2 and 2S2, qualifying communities will receive R26.9 billion net income over the life of the projects (20 years). While some local communities have started to receive dividends, the bulk of the money will start flowing into the communities from 2028 due to debt 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 R1.34 billion per year.

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

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

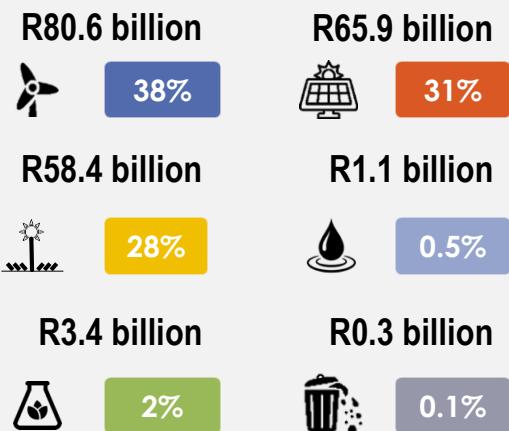
N3

Income to all shareholders only starts with operations. Revenue generated⁴ to date by the 81 IPPs that are operational amounts to R133.5 billion.

Note 1. Income and costs expressed in nominal terms. Net income in real terms equates to R11.5 billion (as opposed to R26.9 billion in nominal terms) under assumption of constant inflation rate of 5.7%. **Note 2.** For BW1 – BW4, 1S2 and 2S2. The DMRE is following due governance processes to recommend the cancellation of the Smalls programme. **Note 3.** Over the operational project life of 20 years. **Note 4.** Revenue generated resembles invoices billed to Eskom for payment.

Technology share of investment

Total Project Costs (Rand billion)



Average investment per MW for each technology group¹

Average investment cost (Rand million/MW)



Investment by technology type

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

By comparison, CSP project costs per MW are higher given the relatively small number of megawatts (600 MW) procured for the R58.4 billion spent (versus 3 366 MW of wind capacity procured for R80.6 billion and 2 372 MW of solar PV capacity for R65.9 billion). However, it should be noted that CSP technology offers inherent thermal energy storage capability, allowing electricity from solar 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 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 2019 included an indicative R/kW overnight² capital cost per technology type (in 2017 Rand terms). The average portfolio project costs and project value³ per MW for each technology type procured under the REIPPPP have been significantly below the 2017 costs as published in the technical report prepared by the Electric Power Research Institute (EPRI)⁴ as an input to the IRP 2019. Note this is not a direct comparison (refer to the 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.

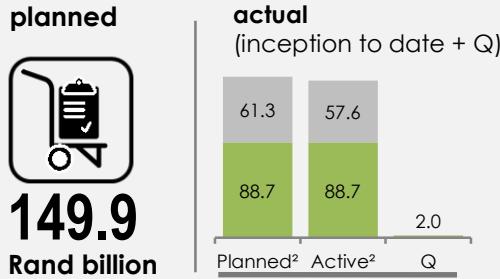
Technology	IRP 2019 (EPRI 2017) ⁴ overnight capital cost Rm/MW	REIPPPP Rm/MW (Project Value) ⁵	REIPPPP Rm/MW (Total project costs) ⁵
Wind	31	18	24
Solar PV	47	21	28
Wind capacity	114	65	97

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.** Refer IA definitions in Appendix A. **Note 4.** Average of different overnight total project costs ranges used for specific intra-technology and project sizes as published in Department of Energy. 2017. Power Generation Technology Data for Integrated Resource Plan of South Africa: Technical Update, April 2017, prepared by the Electric Power Research Institute (EPRI). **Note 5.** REIPPPP Rm/MW is as at Financial Close for BW1, BW2, 16 of 17 BW3 projects, 1 of 2 BW3.5 projects and BW4 projects. All other projects data used is as at Bid submission.

Broader economic and socio economic impacts

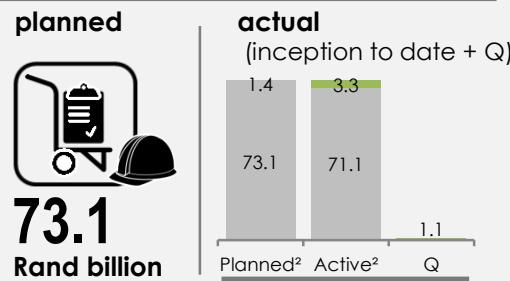
Total procurement spend¹

(Rand billion)



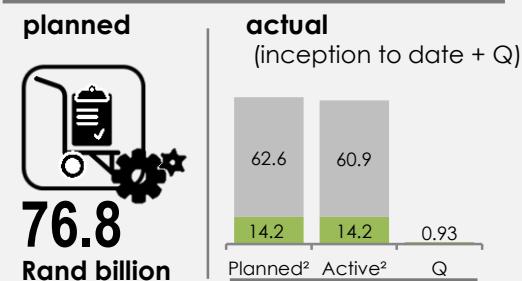
Of which construction spend¹

(Rand billion)



Of which operations spend

(Rand billion)



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.

NOTE:

Planned



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

Active



Refers to all projects that have reached financial close i.e. currently BW1, BW2, 16 of 17 projects in BW3, BW3.5 and BW4

Procurement spend

Procurement spend constitutes a significant share of the total project costs for the portfolio of IPPs. The total projected procurement spend for BW1 to BW4, 1S2 and 2S2 during the construction phase is R73.1 billion, while the projected operations procurement spend over the 20 years operational life is estimated at R76.8 billion. The combined (construction and operations) procurement value is projected as R149.9 billion, of which R88.7 billion has been spent to date. For construction, of the R74.4 billion already spent to date, R67.9 billion is from the 81 projects which have already been completed. These 81 projects had planned to spend R61.5 billion. The actual procurement construction costs have therefore exceeded the planned costs by 10% for completed projects.

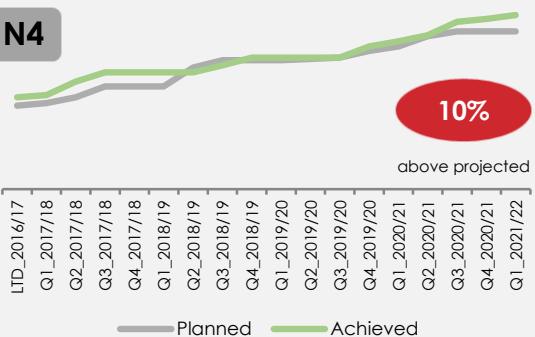
Construction procurement spend has grown steadily over time as the construction of the IPP portfolio advances.

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 reached financial close i.e. currently BW1, BW2, (16 of 17 projects) BW3, BW3.5 and BW4.

Construction spend¹

Actual vs projected (operational projects)

N4



BBBEE spend¹

(Rand billion)

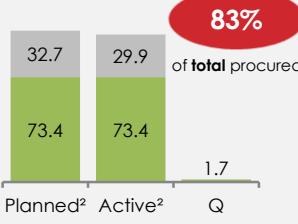
planned



106.1
Rand billion

actual

(inception to date + Q)



BBBEE share of spend

Actual vs target (active projects)³

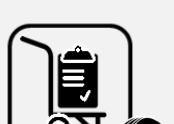


BBBEE spend¹

Construction only (Rand billion)



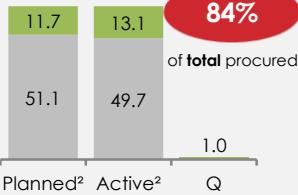
planned



51.1
Rand billion

actual

(inception to date + Q)



Whereas in earlier quarters actual procurement spend lagged the projected spend, the reverse is true for the last few 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 83%, which is significantly higher than the target of 60%, but also the 71% that had been committed by IPPs. BBBEE as a share of procurement spend for projects in construction is reported as 84%, and 75% during operations.

N5

Refer

Page A8 & A9

for detail of the targets and thresholds across bid windows.

While this appears to be a positive response, the reported procurement numbers do not represent the final procurement spend. The data is subject to verification by the IPP Office.

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 R74.4 billion spent on procurement during construction, R62.8 billion has reportedly been procured from BBBEE suppliers. Actual BBBEE spend during construction for BW1 and BW2 alone was R25.5 billion, 81% more than the R14.1 billion planned by the IPPs. The R62.8 billion spent on BBBEE during construction is 23% more than the R51.1 billion that had originally been anticipated by all IPPs procured.

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 reached financial close i.e. currently BW1, BW2, (16 of 17 projects) BW3, BW3.5 and BW4. **Note 3.** Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, BW3.5 and BW4, and projects in operations i.e. BW1 – BW4.

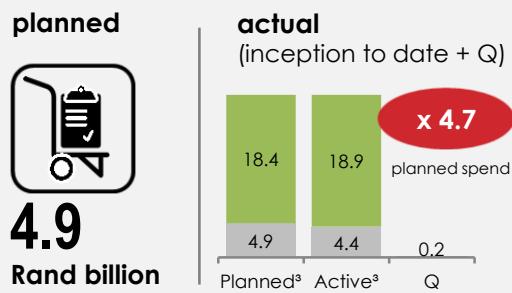
QSE & EME share of spend

Actual vs target (active projects)¹



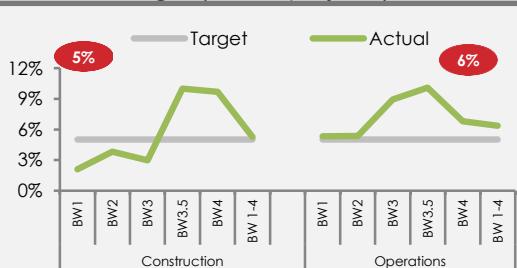
QSE and EME spend²

Construction only (Rand billion)



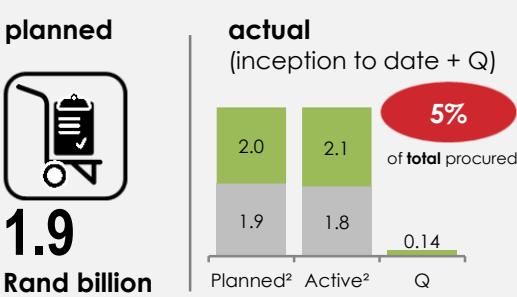
Woman owned share of spend

Actual vs target (active projects)¹



Women owned spend¹

Construction only (Rand billion)



Total procurement spend by IPPs from QSE and EMEs has amounted to R27.1 billion (construction and operations) to date, which exceeds planned spend by 115%, and is 31% of total procurement spend to date (while the required target is 10%).

QSE and EME's procurement spend for construction is achieving 31% of total procurement to date and operations is at 26%, thereby exceeding the 10% target.

QSE and EME share of **construction procurement** spend totals R23.4 billion, which is 4.7 times the planned spend for construction of R4.9 billion during this procurement phase.

Procurement from women-owned vendors of 5% of total procurement spend has been achieved against a 4% commitment and 5% target. To date, 5% of total construction procurement spend has been from woman-owned vendors (against a targeted 5%), and 6% of operational procurement spend has been realised from woman-owned vendors to date, thereby exceeding the targeted 5%.

Refer
Page
A8 & A9

for detail of
the targets
and
thresholds
across bid
windows.

When considering only construction spend of women-owned vendors, R3.9 billion has been spent, which is more than the R1.9 billion expected to be spent during construction on projects that have reached financial close.

10 IPPs are still in, or entering, 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.



Key learning

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

Note 1. Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, BW3.5 and BW4, and projects in operations i.e. BW1 - BW4. **Note 2.** 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 3.** Planned referring to all projects procured i.e. currently BW1 – BW4, 1S2 & 2S2 and Active referring to all projects that have reached financial close i.e. currently BW1, BW2, (16 of 17 projects) BW3, BW3.5 and BW4.

Local content¹

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

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

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

Actual local content spend reported for IPPs that have started construction amounts to R61.9 billion against a corresponding project value (as realised to date) of R123.5 billion. This means 50% 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, the R61.9 billion local content spend reported by active IPPs is already 94% of the R66 billion local content expected. This is with 10 projects still in construction, and 81 of the 91 active projects having reached COD (i.e. 89% of the active portfolio complete).

For the 81 projects that have reached COD, local content spend has been R55.6 billion against a committed R55.5 billion, which is 0.04% more than the planned local content spend.

Local content spend¹

(Rand billion)

45%

local content planned

planned



67.6

Rand billion

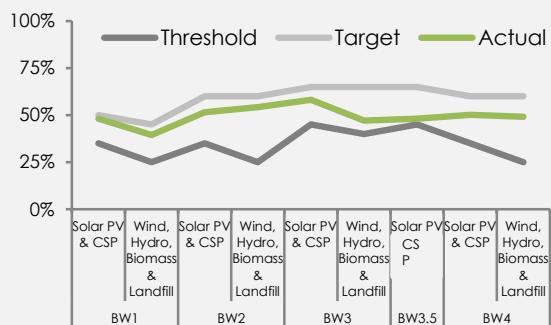
actual

(inception to date + Q)



Local content tracking

Actual % vs target (active projects)³



61.9



50%

local content achieved

(actual) spend to date on **local content**

Local content

Actual vs planned (operational projects)



0.04%

More than planned

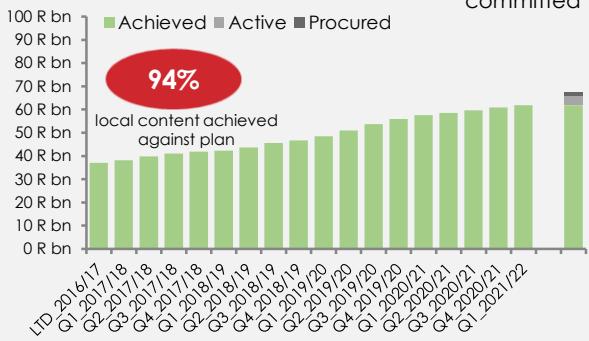
Note 1. Local content is expressed as % of total project value and not procurement or total project costs. See Appendix B for definitions for both terms. **Note 2.** Planned referring to all projects procured i.e. currently BW1 – BW4, 1S2 & 2S2 and Active referring to all projects that have reached financial close i.e. currently BW1, BW2, (16 of 17 projects) BW3, BW3.5 and BW4. **Note 3.** Only 16 of 17 projects in BW3 have reached financial close and started construction. The remaining project has become unviable due to complications with the fuel supply. The DMRE is currently following due process to give effect to the withdrawal of the project from the procurement process. **Note 4.** Thresholds and targets are bid window specific and technology dependent.

Local content

Actual **cumulative¹** (Rand billion)



committed



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 94% 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.

Leveraging employment opportunities

N6

Numerous employment opportunities are being created by the REIPPPP. To date, a total of 60 517 job years² have been created for South African citizens, of which 47 212 were in construction and 13 305 in operations.

Employment opportunities across all the five active bid windows are 140% of the planned numbers for active projects during the construction phase (i.e. 33 707 job years), with 10 projects still in, or entering, construction and employing people. The number of employment opportunities should therefore continue to grow beyond original expectations.

By end June 2021, 81 projects had successfully completed construction and moved into operation. These 81 IPPs had planned to deliver 29 082 job years during the construction phase, but achieved 41 398. This is 42% more than planned.

Construction vs operations

Employment split (job years)



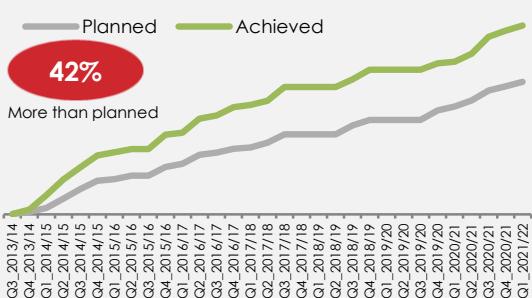
Construction employment

Actual **cumulative¹** (Job years)



Construction employment

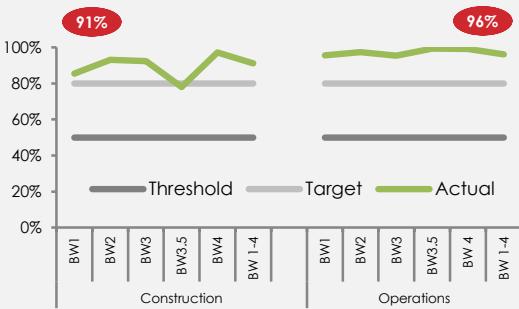
Actual vs planned (operational projects)



Note 1. Actuals tracked against Procured (all projects i.e. currently BW1 – BW4, 1S2 & 2S2) and Active (projects that have reached financial close i.e. currently BW1, BW2, (16 of 17 projects) BW3, BW3.5 and BW4). **Note 2.** The equivalent of a full time employment opportunity for one person for one year.

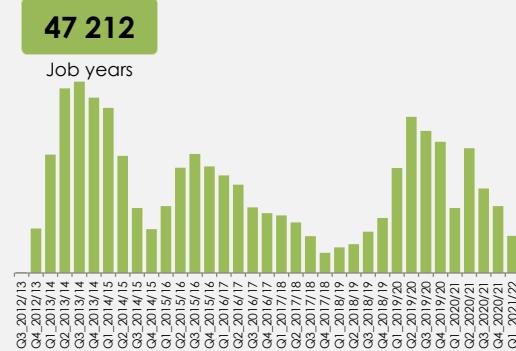
Local citizen employment

Actual vs target (active projects)¹



Employment opportunities

Actual (Job years) (active projects)²



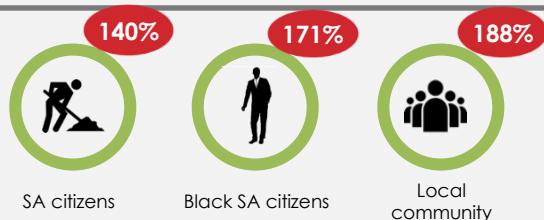
Operations employment

Actual (Job years) (operational projects)



Employment equity

Construction job years vs planned (active projects)²



Employment thresholds and targets were exceeded consistently across the entire portfolio. The average share of South African citizens of total South Africa based employees for BW1 – BW4¹ was 91% during construction (against a target of 80%), while it was 96% during operations for BW1 – BW4 (against a target of 80%).

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

Labour utilisation during construction typically shows a peak, and then decreases as construction activities finish up. This expected trend is visible in the reported numbers per quarter. Employment numbers during construction peaked in Q3 2013/14 and thereafter tapered off as more IPPs concluded construction. Construction followed the same trend from Q1 2015/16, as BW3 projects started construction, and in Q4 2018/19 when BW4 projects started construction.

To date, 81 IPPs have started operations, with an average operating duration of approximately 58 months.

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

To date, 47 212 job years for SA citizens were achieved during construction, which is 40% above the planned 33 707 job years for active projects. These job years are expected to rise further since 10 projects are still in, or entering, construction.

Significantly more people from local communities were employed during construction than was initially planned. For active projects, the expectation for local community participation was 13 284 job years. To date 24 974 job years have been realised (i.e. 88% more than initially planned), with 10 projects still in, or entering, construction.

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

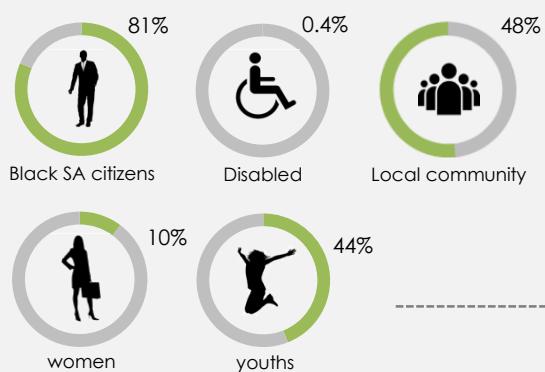
Refer
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A8 & A9

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, BW3.5 and BW4, and projects in operations i.e. BW1 - BW4. **Note 2.** Actuals for projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, BW3.5 and BW4.

Employment equity share of persons employed in construction

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



Employment equity share of persons employed

Actual % vs target (active projects)²



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

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

During the construction phases, black South African citizens, youths and rural or local communities have been the major beneficiaries as they respectively represent 81%, 44% and 48% of total job opportunities created by IPPs to date. However, women and disabled people could still be significantly empowered as they represent a mere 10% and 0.4% 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 A8 & A9

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 creation, equity and the drive towards more equal societies.

The share of black citizens employed during construction (81%) and the early stages of operations (85%) 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 (71%) and operations (82%) is exceeding the 30% target and the minimum threshold of 18%.

The share of local community members as a share of SA-based employees was 48% and 69% for construction and operations respectively – exceeding the minimum threshold of 12% and the target of 20%.

Note 1. Actuals for projects that have commenced construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, BW3.5 and BW4. **Note 2.** Actuals for projects in construction i.e. currently BW1, BW2, (16 of 17 projects) BW3, BW3.5 and BW4 and projects in operations i.e. BW1 – BW4.

Socio-economic development (Rand billion)

(Rand billion)

Committed

2.0%

of revenue

R 23.1 billion

Realised (ITD + Q)

R 23.1 billion

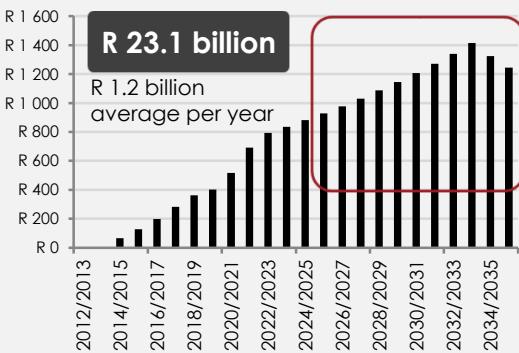
5%

In reporting Q



SED future contribution forecast (Rand million)

(Rand million)



SED in local communities (Rand billion)

(Rand billion)



R 18.8 billion

committed to local communities

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 lifetime and are being used for housing and infrastructure as well as healthcare, education and skills development, and other community development initiatives.

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% or 101% more than the minimum compliance threshold**.

Across the seven bid windows, a total contribution of R23.1 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R1.2 billion.

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

As a percentage of revenue, **SED obligations become effective only when operations commence and revenue is generated**. Of the 91 IPPs that have reached financial close (BW1 – BW4¹), 81 are operational.

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

SED contributions amount to R1.6 billion to date. Of this, R76.7 million or 5% was spent in this reporting quarter.

Note 1. There is still one project in BW3 that is yet to reach financial close (however, the project has become unviable due to complications with the fuel supply, and the DMRE is currently following due process to give effect to the withdrawal of the project from the procurement process).

1.6 Rand billion



1.3%
of revenue

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

Activity spread for ED and SED

Projects spend reported to date (% of total)



education

40.8%



social welfare

21.9%



health care

4.5%



general administration

9.4%



enterprise development

23.5%

437.5 Rand million



provided as support to **1 388 education institutions**¹ from 2015 to end of June 2021²

210.8 Rand million



awarded for **1 276 bursaries** from 2015 until the end of June 2021²

For the 81 projects that are operational, the actual SED contribution of R1.6 billion to date represents approximately 1.3% of total revenue generated to date, which is equivalent to the commitment of these projects over the 20 year project operational life.

SED contribution categories

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

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

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

N5

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

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

IPPs have supported 1 388 education institutions¹ with a total of R437.5 million in contributions, from 2015 to the end of June 2021².

A total of 1 276 bursaries, amounting to R210.8 million, have been awarded by 67 IPPs from 2015 until the end of June 2021². The largest portion of the bursaries were awarded to African and Coloured students (97.4%), with women and girls receiving 56.3% of total bursaries. The Northern Cape province benefitted most from the bursaries awarded, with 57.2%, followed by the Eastern Cape (20.2%) and the Western Cape (14.1%).

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

Note 1. Institutions include Early childhood development centres (474), Primary (619) and Secondary Schools (295). **Note 2.** This information is received from IPPs once a year, and updated annually in Quarter 1.

The IPP Office recognises the need to continue enhancing the impact of community development initiatives and SED contributions made by IPPs. The following challenges have been noted regarding the current SED framework in the REIPPPP:

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

As a result, the IPP 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.

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.

Enterprise development contributions

Enterprise development

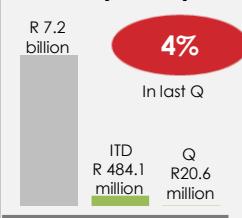
(Rand billion)

Committed



R 7.2 billion

Realised (ITD + Q)



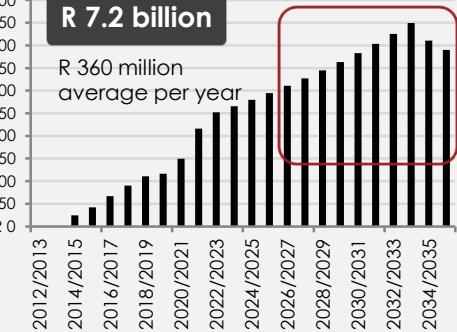
ED future contribution forecast

(Rand million)



R 7.2 billion

R 360 million average per year



Enterprise development in local communities

(Rand billion)

R 5.6 billion

committed to local communities

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

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

Until the end of this reporting period, a total of R484.1 million has been contributed to enterprise development by the 81 operating IPPs. Of the R484.1 million, R20.6 million was contributed in this quarter alone.

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

Of the total commitment, R5.6 billion is specifically committed directly within the local communities where the IPPs operate, contributing significantly to local enterprise development. A total contribution of R451.5 million has already been made to the local communities (i.e. 93% of the total R484.1 million enterprise development contributions made to date).

N6

Contributing to cleaner energy

Carbon emissions targets

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

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

The REIPPPP contributes constructively to economic stability, energy security and environmental sustainability.

Emissions factor

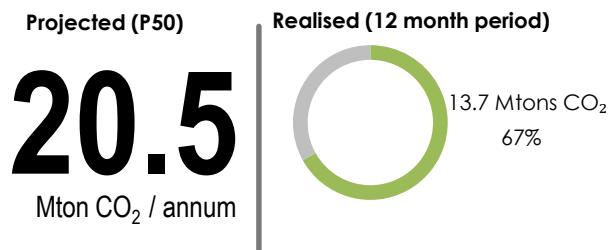
Carbon emissions reduction is calculated based on a displacement of power from largely coal-based to more environmentally friendly electrical energy generation using a gross Eskom equivalent emissions factor of 1.015¹ tons CO₂/MWh. A more comprehensive approach with regards to emission factors of specific technologies is to be done in consultation with the DEA.

Emission reductions achieved

Using this approach, the emission reductions for the programme during the preceding 12 months is calculated as 13.7 million tonnes CO₂ (Mton CO₂) based on the 13 488 GWh energy that has been generated and supplied to the grid over this period. This represents 67% of the total projected² annual emission reductions (20.5 Mton CO₂) achieved with only partial operations. A total of 63.9 Mton CO₂ equivalent reduction has been realised from programme inception to date.

Carbon emission reductions

Projected using P50 (Mton CO₂)



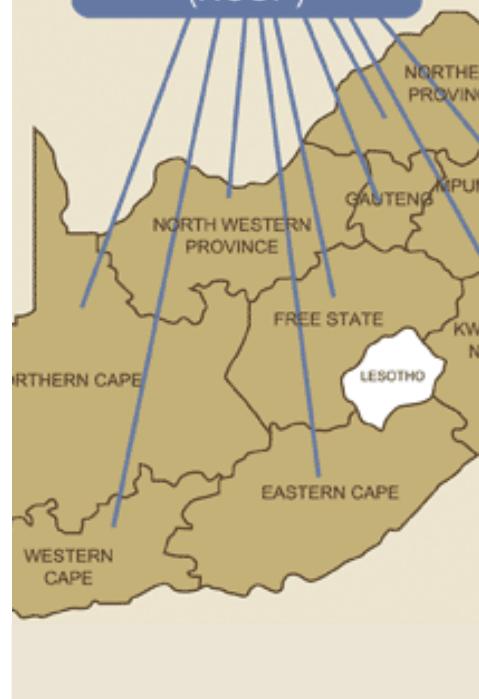
Note 1. Carbon accounting for South Africa, UCT, Energy Research Centre (ND). **Note 2.** Emission reductions associated with the projected, annual energy production (P50) for the total portfolio.

National Government



NATIONAL ASSEMBLY

NATIONAL COUNCIL
OF PROVINCES
(NCOP)



The REIPPPP contribution:

Provincial analysis

Provincial contribution

Capacity development at a glance

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

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

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

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.

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.

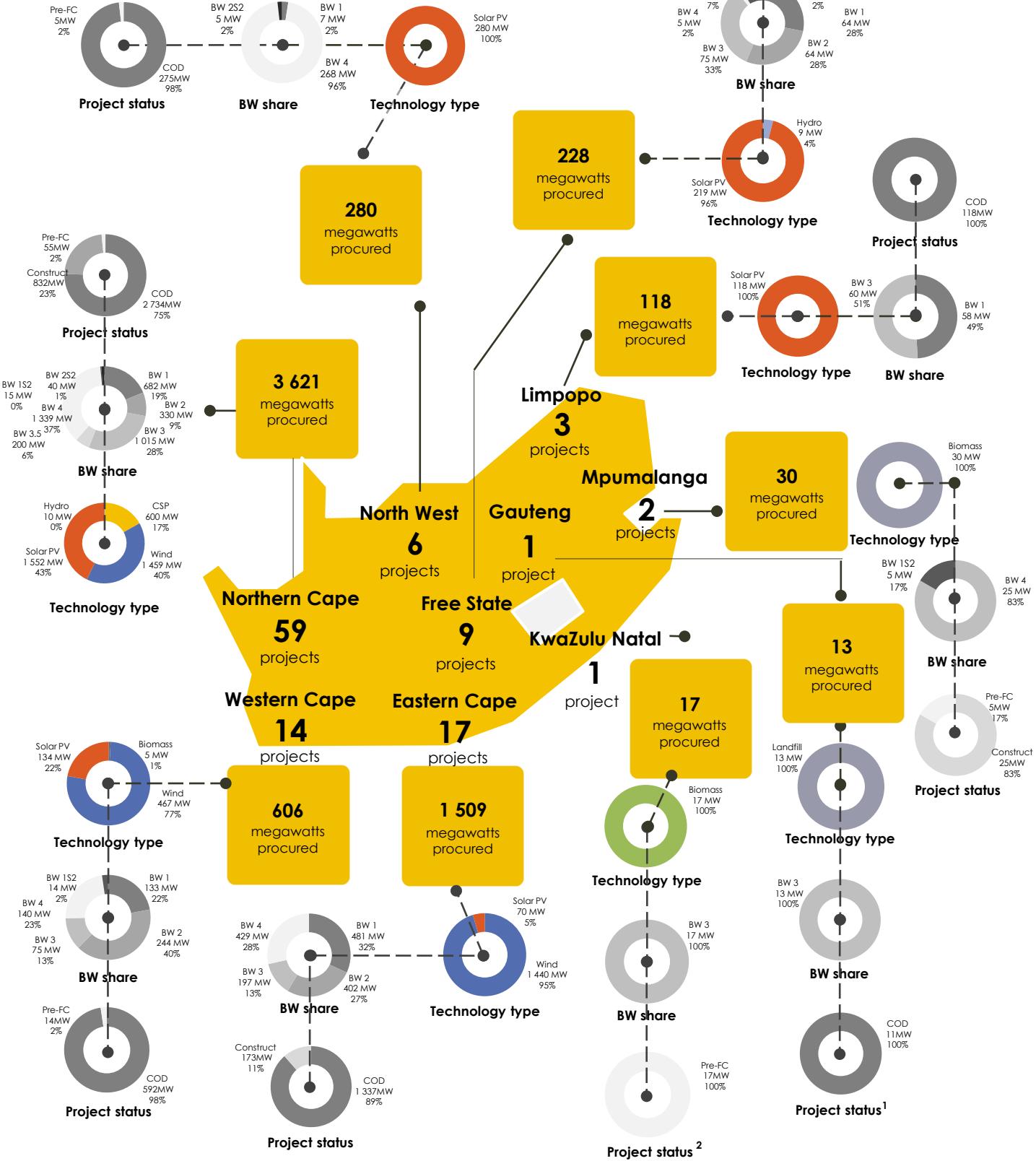
Provincial capacity at a glance

38

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 26 MW in the actual operational capacity delivered to the grid on completion. The actual operational capacity achieved is shown in the detail on each province.

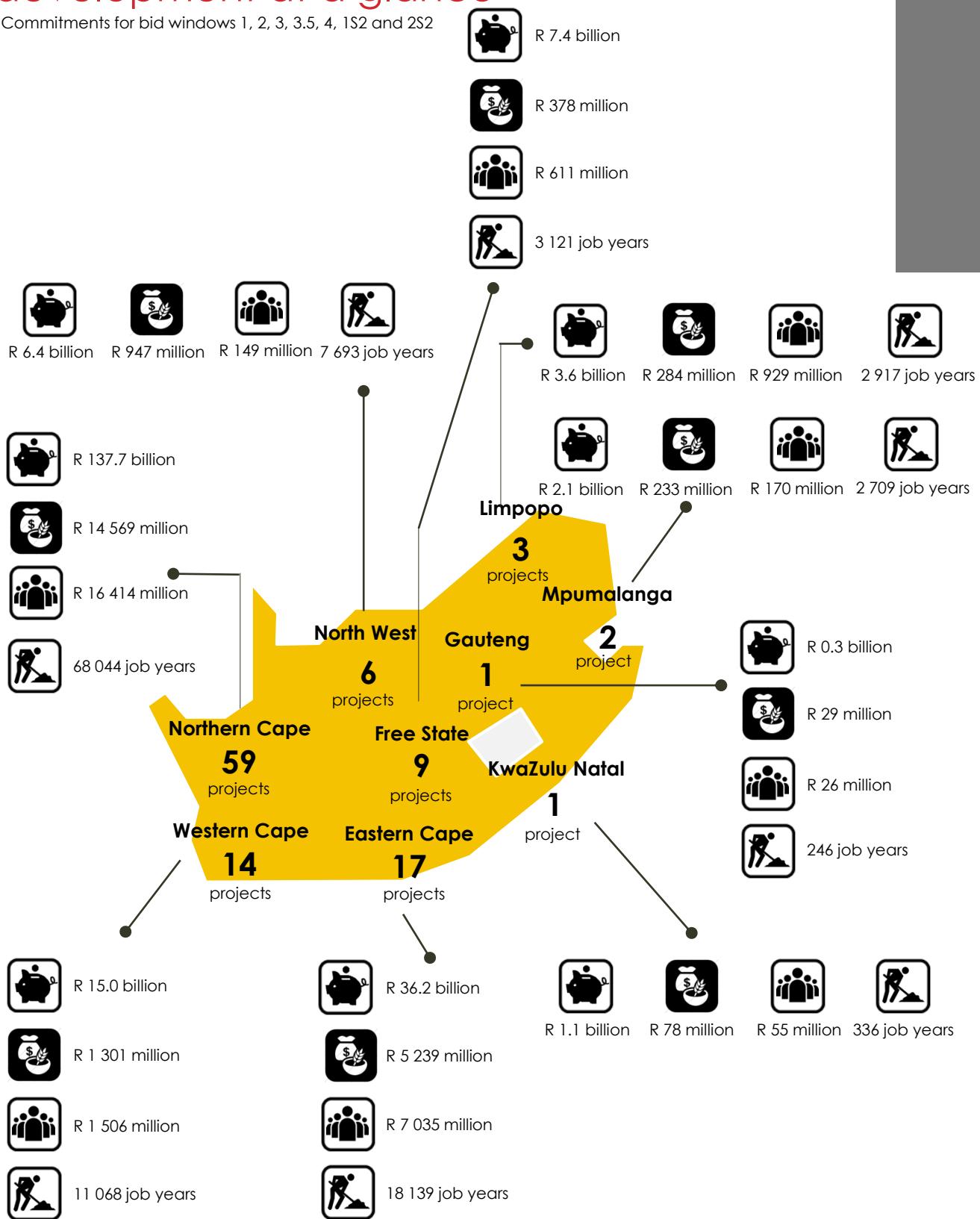


Note 1. Three (3) sites with Contracted Capacity of 5 MW, 3 MW and 3 MW reached COD, while the construction of the remaining 2 sites with 1 MW and 1 MW contracted capacity was terminated, following an exemption granted by the Department in December 2019. **Note 2.** Financial close of the project is unlikely as the project has become unviable due to complications with the fuel supply. The DMRE is currently following due process to give effect to the withdrawal of the project from the procurement process.

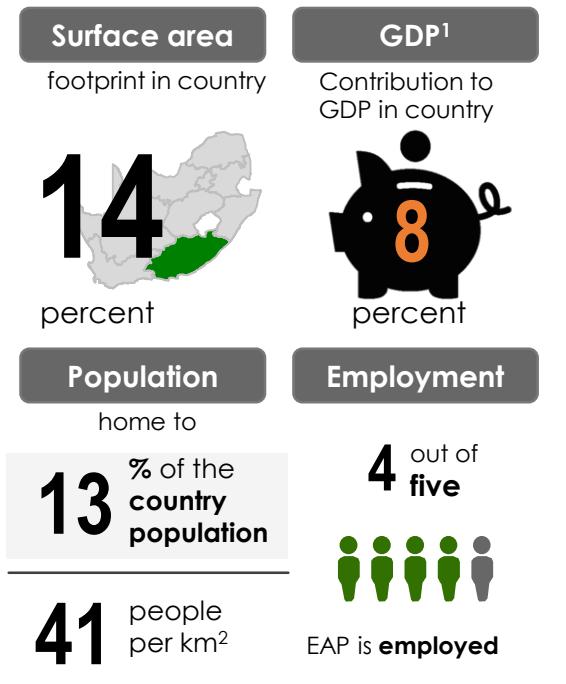
Provincial economic and socio economic development at a glance

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

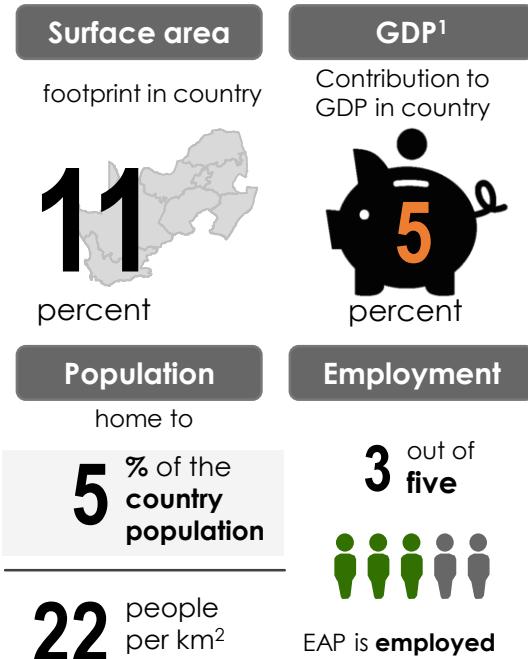
39



Province • Eastern Cape

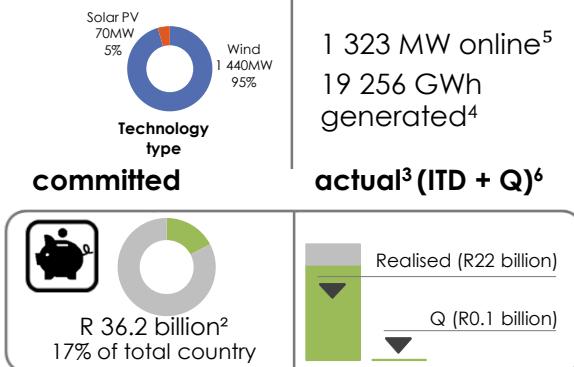


Province • Free State

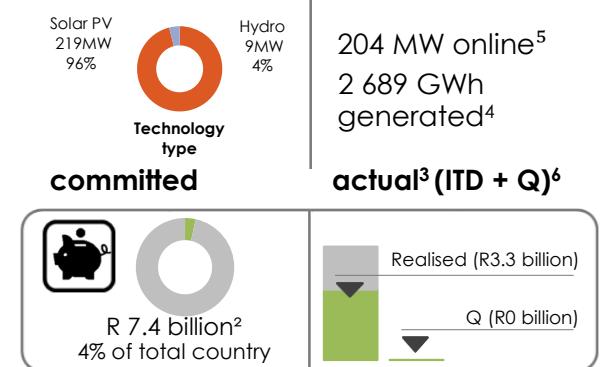


40

17 projects | 1 509 MW 



9 projects | 228 MW 



Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2016 Estimates. **Note 2.** IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years). **Note 3.** Actuals Inception to Date (ITD) shown against total committed (BW1, 2, 3, 3.5, 4, 1S2 and 2S2) and progress is monitored against total project value, not total project cost.

Note 4. Cumulative energy. **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

Surface area

footprint in country

GDP¹

Contribution to GDP in country



Population

home to

739 people per km²

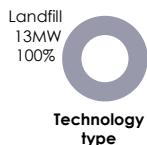
Employment

4 out of five



EAP is employed

1 project

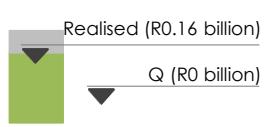
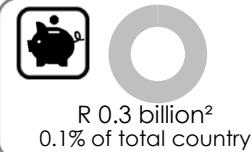


committed

13 MW



8 MW online⁵
124 GWh generated⁴

actual³ (ITD + Q)⁶

Province • KwaZulu-Natal

Surface area

footprint in country

GDP¹

Contribution to GDP in country



Population

home to

117 people per km²

Employment

4 out of five

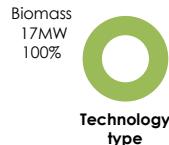


EAP is employed

1 project

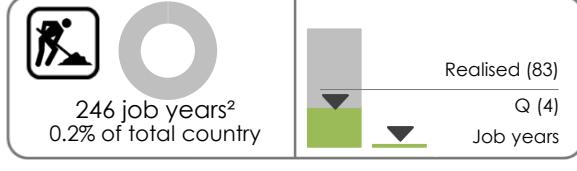
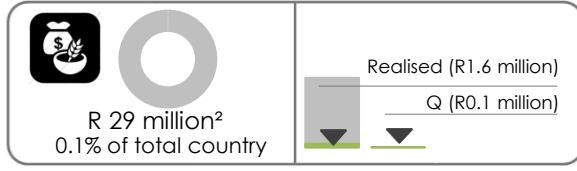
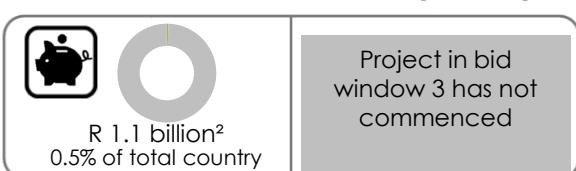
1 project

17 MW



committed

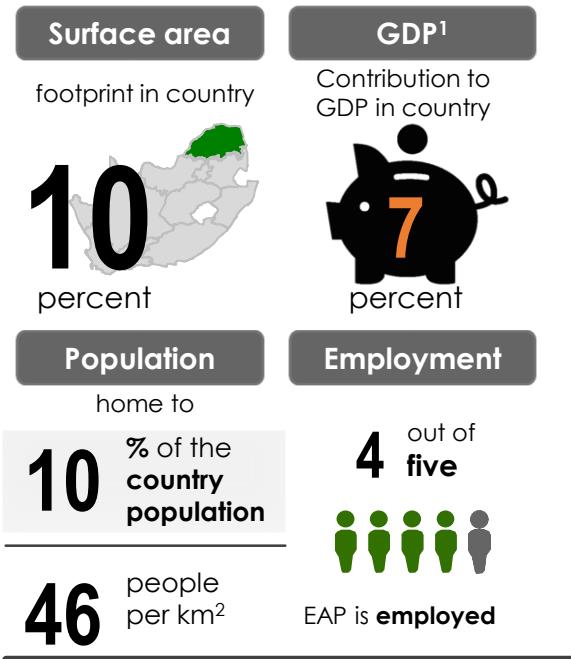
0 MW online⁵
0 GWh generated⁴

actual³ (ITD + Q)⁶

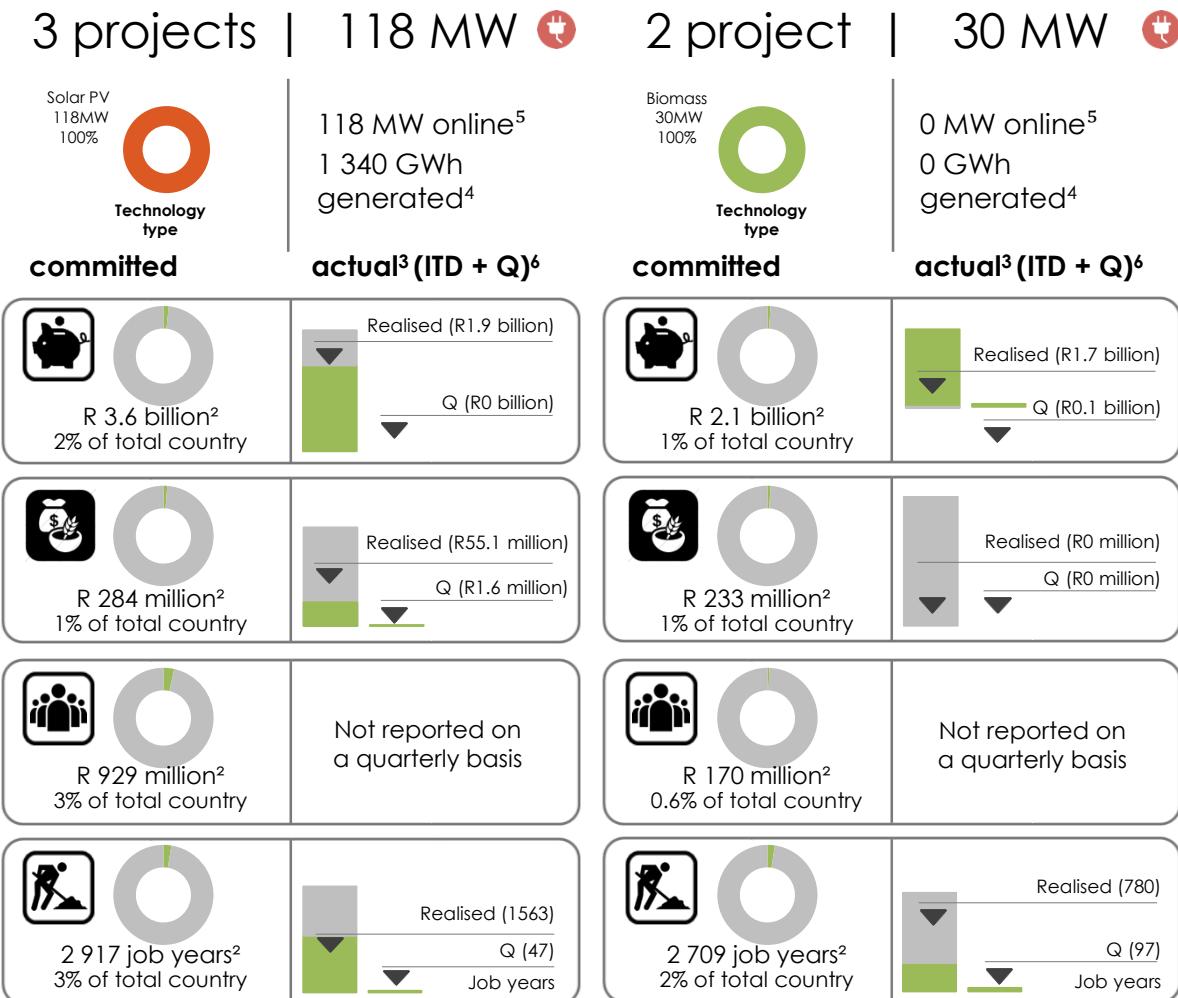
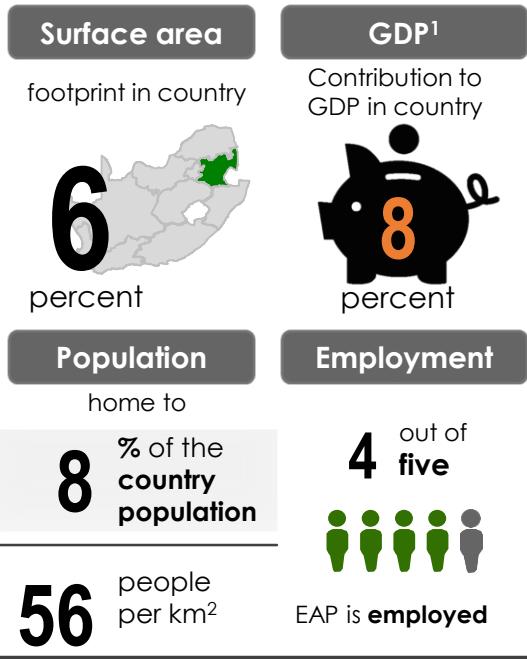
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Note 4. Cumulative energy. **Note 5.** Online refers to capacity of projects that have reached COD and excludes projects in Early Operations Period (EOP). **Note 6.** ITD – realised inception to date; Q – realised during reporting quarter.

Province • Limpopo



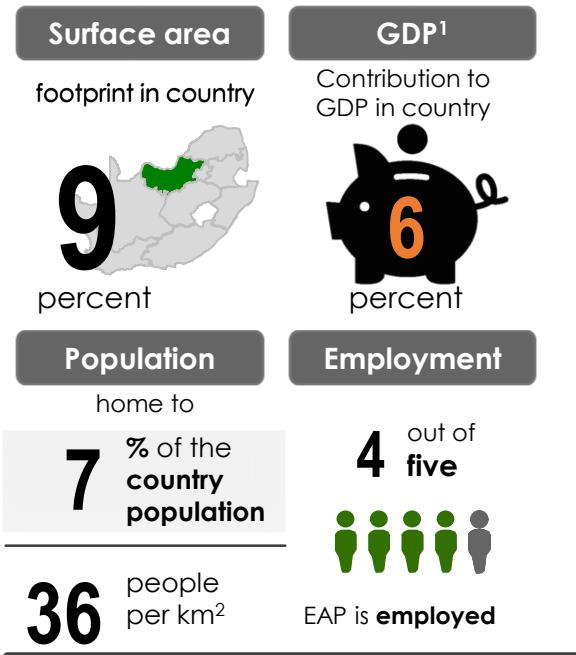
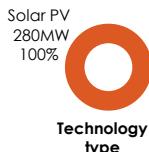
Province • Mpumalanga



Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2016 Estimates. **Note 2.** IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years). **Note 3.** Actuals Inception to Date (ITD) shown against total committed (BW1, 2, 3, 3.5, 4, 1S2 and 2S2) and progress is monitored against total project value, not total project cost.

Note 4. Cumulative energy. **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

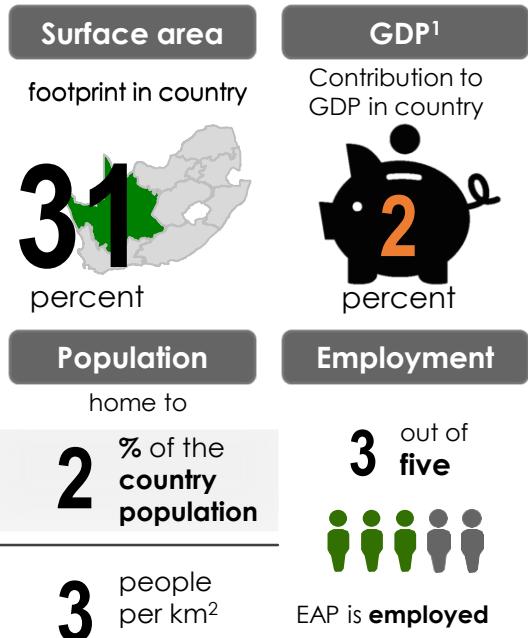
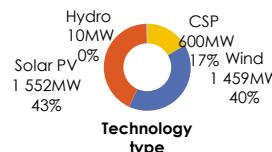
6 projects | 280 MW **committed**

275 MW online⁵
451 GWh generated⁴

actual³ (ITD + Q)⁶

R 6.4 billion²
3% of total country

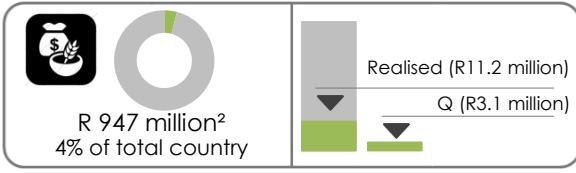
Province • Northern Cape

59 projects | 3 621 MW **committed**

2 731 MW online⁵
31 615 GWh generated⁴

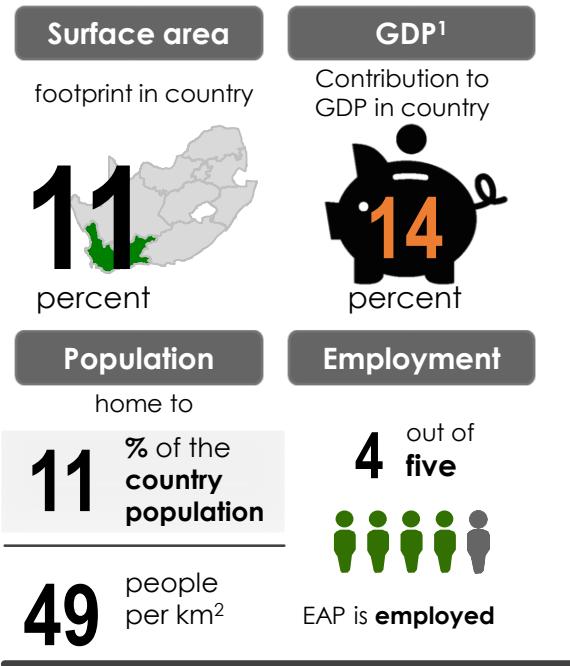
actual³ (ITD + Q)⁶

R 137.7 billion²
66% of total country

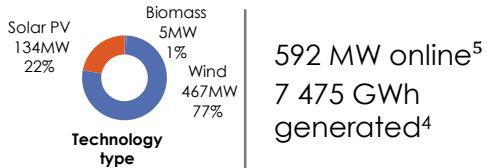


Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2016 Estimates. **Note 2.** IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years). **Note 3.** Actuals Inception to Date (ITD) shown against total committed (BW1, 2, 3, 3.5, 4, 1S2 and 2S2) and progress is monitored against total project value, not total project cost.

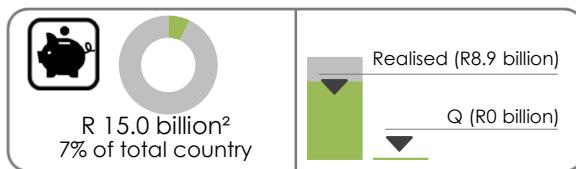
Note 4. Cumulative energy. **Note 5.** Online refers to capacity of projects that have reached COD and excludes projects in Early Operations Period (EOP). **Note 6.** ITD – realised inception to date; Q – realised during reporting quarter.



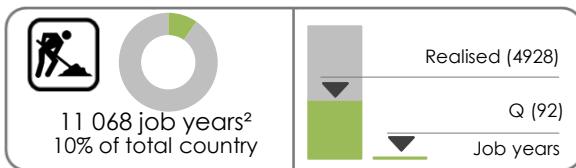
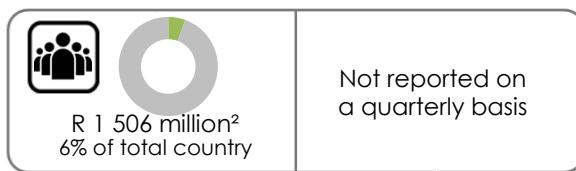
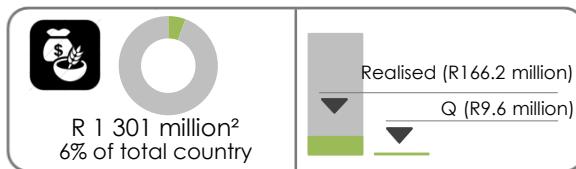
14 projects | 606 MW



committed



actual³ (ITD + Q)⁶



Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2016 Estimates. **Note 2.** IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years). **Note 3.** Actuals Inception to Date (ITD) shown against total committed (BW1, 2, 3, 3.5, 4, 1S2 and 2S2) and progress is monitored against total project value, not total project cost.

Note 4. Cumulative energy. **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

IPPPP context and background

Introduction

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, social and environmental goals. Energy infrastructure is a critical component that underpins economic activity and growth across the country, and it needs to be robust, extensive and affordable enough to meet industrial, commercial and household needs.

In formulating its vision for the energy sector, the NDP took as a point of departure the Integrated Resource Plan for electricity (IRP) 2010 to 2030 as promulgated in March 2011¹. This was subsequently updated and the promulgated IRP 2019 replaced the IRP 2010 in October 2019 as the country's official electricity infrastructure plan to 2030².

As with the IRP 2010, the IRP 2019 proposes a diverse energy mix with which to meet the country's electricity needs to 2030. Specifically, the **IRP 2019 identifies 39 696 MW to be added to the national grid between 2019 and 2030**.

This accounts for all **committed and new additional capacity** of 37 696 MW between 2019 and 2030, as well as a **short-term capacity gap** of at least 2 000 MW that needs to be filled between 2019 and 2022. The IRP 2019 also anticipates 4 000 MW from own-use **distributed and/or embedded generation** technologies between 2023 and 2030, as well as coal-fired capacity of 11 017 MW that has to be decommissioned to 2030. These allocations will effectively raise overall new electrical capacity additions to 43 696 MW by 2030 to result in a total installed electricity base of 84 783 MW⁷, from around 52 104 MW in 2018³.

In line with the NDP's vision and commitment for a **just transition to a more environmentally sustainable and low-carbon economy**, the IRP 2019 projects that the contribution of coal to total installed electrical generation capacity would decline gradually. In that regard, the share of coal-fired generation is set to decline from 72% in 2018 to less than 43% in 2030, whilst that of renewable energy and complementary technologies continue to grow.

Of the IRP 2019's 39 696 MW to be installed to 2030, 8 208 MW⁶ (20.7%) reflects capacity that has already been committed or contracted under IRP 2010 for grid connection between 2019 and 2022, while **31 488 MW (79.3%) represents new additional capacity that has to be added between 2019 and 2030**^{4,5}.

The technological composition of additional new capacity⁴ to be added between 2019 and 2030 is as follows:

- **Wind:** 14 400 MW (45.7%);
- **Solar photovoltaic (PV):** 6 000 MW (19.1%);
- **Gas and/or diesel:** 3 000 MW (9.5%);
- **Hydroelectricity:** 2 500 MW (7.9%);
- **Energy storage:** 2 088 MW (6.6%);
- **Coal:** 1 500 MW (4.8%); and
- **Range of energy technologies to fill the short-term capacity gap:** 2 000 MW (6.4%).

Section 34 of the Electricity Regulation Act No.4 of 2006, pertaining to Electricity Regulations on New Generation Capacity, enable the Minister of Mineral Resources and Energy to determine new electrical energy generation capacity requirements in consultation with the National Energy Regulator of South Africa (NERSA) for its concurrence.

Note 1. Published in Government Gazette No. 34263 vol. 551 of 6 May 2011. **Note 2.** Published in Government Gazette No. 42784 vol. 652 of 18 October 2019. **Note 3.** Koeberg nuclear power plant's lifetime extension in 2024 is not considered additional new capacity since it is already included in the total installed electricity production base. **Note 4.** 29 488 MW new additional capacity from 2022 to 2030 and 2 000 MW short-term capacity gap in 2019 to 2022. Excluding distributed generation allocation. **Note 5.** NERSA concurred with two Ministerial determinations to date. The first determination is for the procurement of a range of energy technologies to close an immediate 2 000 MW gap between 2019 and 2022 as identified in the IRP 2019, and the second determination is for the procurement of 13 813 MW from coal (1 500 MW), gas (3 000 MW), wind and solar (6 800 MW) and energy storage (513 MW). **Note 6.** Committed / contracted under IRP 2010 for Coal (5 732 MW), Solar PV (814 MW), Wind (1 362 MW) and CSP (300 MW). **Note 7.** Total installed capacity including installed capacity to date, committed and / or contracted capacity, capacity decommissioned and new additional (i.e. 33 364 MW for coal, 1 860 MW for nuclear, 8 288 MW for PV, 17 742 MW for wind, 600 MW for CSP, 4 600 MW for hydro, 6 830 MW for gas, 5 000 MW for energy storage, 4 499 MW for distributed generation, cogeneration, and biomass and 2 000 MW for the short-term capacity gap).

Once NERSA has concurred with **Ministerial determinations, they give effect to the procurement process and implementation of the relevant capacity allocations of the IRP**. The determinations further specify whether the new generation capacity shall be established by Eskom, another organ of state or an independent power producer (IPP).

Prior to the release of the promulgated IRP 2019, the procurement of electrical energy from IPPs was informed by Ministerial determinations made in alignment with the IRP 2010. However, all Ministerial determinations made within the ambit of the IRP 2010 for electrical capacity, that has not already been contracted before the promulgation of the IRP 2019, has expired. New Ministerial determinations are therefore required, with the concurrence of NERSA, to give effect to the capacity allocations stipulated in the IRP 2019.

In that regard, the **Minister of Mineral Resources and Energy issued determinations to NERSA in February 2020 for 13 813 MW** of new generation capacity to be procured from IPPs in alignment with the respective capacity allocations in the IRP 2019.

To date, two Ministerial determinations has been promulgated, following concurrence by NERSA. A total of **13 813 MW** has been determined, which **represents 43.9% of the total 31 488 MW target¹** for new additional capacity that has to be added by 2030 as stipulated in the IRP 2019.

The first determination, promulgated in July 2020, calls for the procurement of 2 000 MW from a range of technologies, to fill the short-term capacity gap.

A second determination, which was promulgated in September 2020, allows for procurement from the following technologies, for the short and medium term:

- **Solar PV and Wind:**
6 800 MW between 2022 and 2024;
- **Energy storage:**
513 MW in 2022;
- **Gas:**
3 000 MW between 2024 and 2027; and
- **Coal:**
1 500 MW between 2023 and 2027.

Opening the market for IPPs

A significant share of South Africa's new electrical energy capacity requirements will be developed and produced by IPPs. The introduction of private sector generation offers multiple benefits, for example:

- Reducing reliance on constrained fiscal resources;
- Contributing to the diversification of energy supply and nature of its production;
- Improving energy security and modernity;
- Attracting much-needed new investment, skills, technologies and competition into the industry;
- Stimulating local industry development and job creation; and
- Enabling benchmarking of performance and pricing.

	New ministerial determinations (MW)	Technology share of total determinations	Respective IRP 2019 target by 2030 (MW)	Determination share of respective IRP 2019 target by 2030	IRP 2019 capacity allocation reference years
Short term capacity gap	2 000	14.5%	2 000	100.0%	2019 to 2022
Coal	1 500	10.9%	1 500	100.0%	2023 to 2027
Energy storage	513	3.7%	2 088	24.6%	2022
Solar PV and Wind	6 800	49.2%	20 400	33.3%	2022 to 2024
Gas & diesel	3 000	21.7%	3 000	100.0%	2024 to 2027

Note 1. 29 488 MW new additional capacity from 2022 to 2030 and 2 000 MW short-term capacity gap in 2019 to 2022. Excluding distributed generation allocation.

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 electrical generation capacity. These guidelines include:

- compliance with the IRP;
- 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

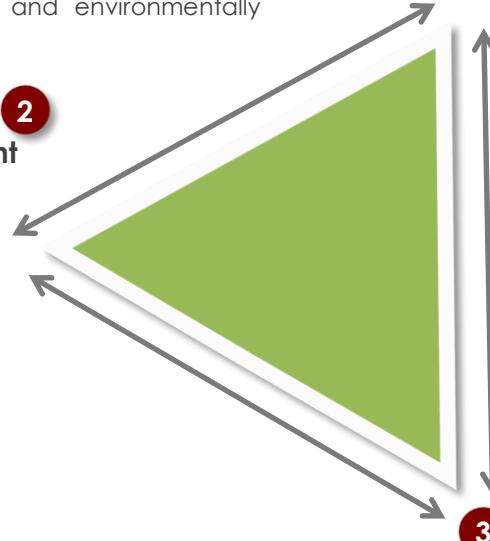
The Department of Mineral Resources and Energy (DMRE), National Treasury (NT) and the Development Bank of Southern Africa (DBSA) established the IPP Office for the specific purpose of delivering on the IPP procurement programme objectives.

In November 2010 the DMRE and NT entered into a Memorandum of Agreement (MoA) with the DBSA to provide the necessary support to implement the IPPPP and establish the IPP Office. A new MoA was agreed upon by all parties in May 2016 for an additional 3-year period, then again in April 2019 for another year, and in March 2020 it was extended for an additional 3-year period to 2023.

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.

Non Renewable Energy Procurement

- Coal
- Cogeneration
- Gas



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 to the establishment of broader regional linkages and partnerships. Active engagement and collaboration has occurred with, amongst others, the South African Development Community (SADC), African Union (AU) and South African Power Pool (SAPP). Bilateral relations 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 and non-renewable generation capacity from the private sector in accordance with the electrical capacity allocations in the IRP; ministerial determinations and DMRE support service requirements.

The IPP Office provides the following services:

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

Renewable Energy Procurement

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

Advisory services

- Gas Policy Framework
- Energy Solutions for the future
- Grid Development and Grid Code Enhancement
- Solar Water Heaters Repair and Replace
- Regulatory and legislative aspects impacting on the IPPPP
- Regional co-operation

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 IPP 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, implementation and financing focused on creating an enabling and stable market environment for IPPs;
- It is directly and indirectly **contributing to broader national social and economic development objectives**.

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

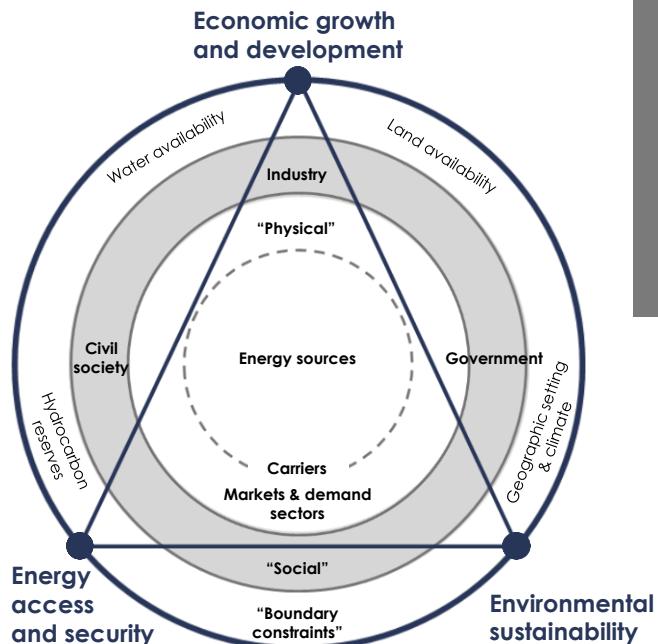
Energy triangle²

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 renewables, gas and energy storage.

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.

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, developmentally progressive and clean energy bid programme, the IPPPP is successfully meeting the challenges of the energy triangle through the respective procurement programmes.

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 to table on 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.**

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 DMRE. The procurement and support services of the IPP Office, as IPP Procurement Office for the DMRE, 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

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, as well as SIP 20: Energy.

Note 1. By setting compliance thresholds and directing socio-economic development (SED) contributions from IPPs. **Note 2.** A selection of relevant indicators only. **Note 3.** It is recognised that NDP targets is based on the IRP 2010 and will be amended to reflect the IRP 2019, which was promulgated in October 2019 and replaced the IRP 2010 as the country's official electricity infrastructure plan.

Out-come	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 ³
1	Adequate electricity generation capacity commissioned	44 000 MW (Eskom)	10 000 MW (added)
2	Electricity generation reserve margin increased	1%	19%

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

Refer to

Page A10

for more detail on SIPs

Apart from contributing to outcome 6, key to the design of the IPPPP is supporting the DMRE's commitment to contribute to the achievement of outcomes 2, 4, 7, 8 and 10 and so stimulate a virtuous cycle of development growth associated with the renewable and non-renewable energy programmes.

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

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

- **Job creation**, with the emphasis on jobs for South African citizens, South African citizens who are black people and South African citizens from local communities;
- **Local content**, with the view that a certain percentage of the project value would be spent in South Africa;
- **Ownership**, with the aims to advance ownership by black people and local communities;
- **Management Control**, with the aim to achieve the involvement of black people in management positions and responsibilities;
- **Preferential Procurement**, with focus on sub-contracting to empowered enterprises, black enterprises and enterprises owned by women;
- **Enterprise Development**, with the aim of development of emerging enterprises, and those emerging enterprises located in local communities; and
- **Socio-economic Development**, which attempts to address the socio-economic needs of local communities.

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

Outcome 2 – Improved health facility planning and infrastructure delivery.

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

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

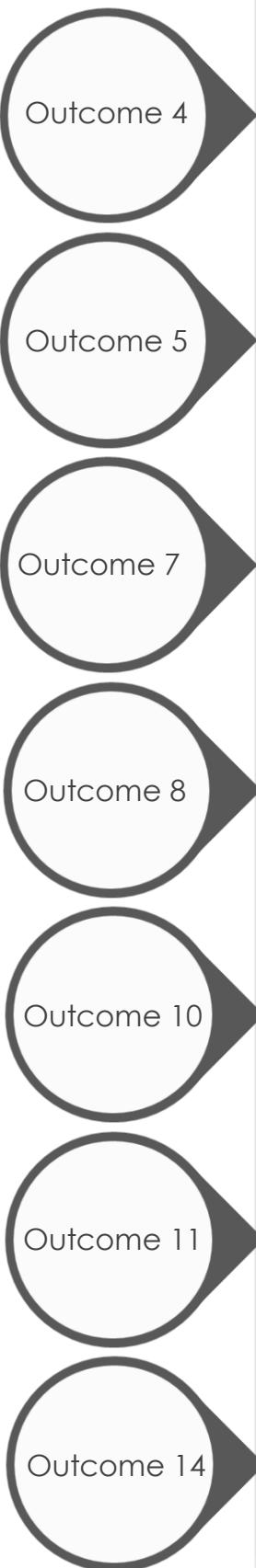
A contribution towards this outcome is made through community projects that include infrastructure development such as development of roads or electrification of local communities.

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



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

Alignment of development objectives and bid obligations



Outcomes Relevant focus	Bid category	A7
<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. 	Job creation Enterprise development Ownership Preferential procurement Local content	
<p>Outcome 5 – A skilled and capable workforce to support inclusive growth.</p>	Job creation Management control	
<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. 	Job creation Socio-economic development Ownership Enterprise development	
<p>Outcome 8 – Sustainable human settlements and improved quality of household life.</p>	Socio-economic development	
<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. 	Resulting from power generation from 'clean' energy sources (a consequence of Outcome 6)	
<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). 	Ownership	
<p>Outcome 14 – Nation building and social cohesion</p> <ul style="list-style-type: none"> • Disability and gender equality, • Equal opportunities and redress inequality. 	Preferential procurement Job creation Ownership	

Alignment of thresholds and targets across bid windows

A8

Bid obligation category	BW1		BW2		BW3, 3.5 & 4		BW1S2 & 2S2	
	Min	Target	Min	Target	Min	Target	Min	Target
Job creation								
4 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%



As % of
Project
Value

Key learnings incorporated

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



	Min	Target	Min	Target	Min	Target	Min	Target
Ownership								
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.

Alignment of thresholds and targets across bid windows

A9

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

	Min	Target	Min	Target	Min	Target	Min	Target
	Min	Target	Min	Target	Min	Target	Min	Target
Preferential procurement								
4 BBBEE Procurement spend	-	60%	-	60%	-	60%	-	70%
14 SME and QME (QSE and EME) Procurement	-	10%	-	10%	-	10%	-	20%
Women owned vendor procurement	-	5%	-	5%	-	5%	-	10%



	Min	Target	Min	Target	Min	Target	Min	Target
	Min	Target	Min	Target	Min	Target	Min	Target
Enterprise development²								
4 Enterprise development contributions	-	0.6%	-	0.6%	-	0.6%	-	1% As % of Revenue
7 Adjusted enterprise development contributions	-	0.6%	-	0.6%	-	0.6%	-	1%



	Min	Target	Min	Target	Min	Target	Min	Target
	Min	Target	Min	Target	Min	Target	Min	Target
Socio-economic development								
7 Socio-economic development contributions	1.0%	1.5%	1.0%	1.5%	1.0%	1.5%	-	3% As % of Revenue
8 Adjusted socio-economic development contributions	1.0%	1.5%	1.0%	1.5%	1.0%	1.5%	-	3%



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 renewable energy infrastructure imperative.

On 24 July 2020, an additional 6 SIPs were designated to support the implementation of South Africa's Infrastructure Investment Plan. The projects are divided into the following categories: Water and Sanitation, Energy, Transport, Digital Infrastructure, Agriculture and Agro-processing, and Human settlements.

The SIP 20 (Energy) is relevant for the IPPPP as it includes the Risk Mitigation Power Purchase Procurement Programme and the Small IPPPP.

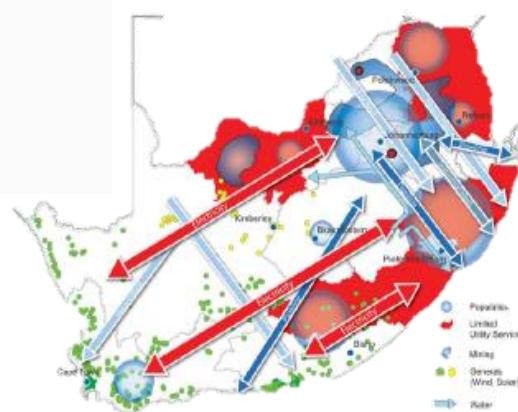
Item	Strategic Infrastructure Project	Engage	Report + align
1	<p>SIP 1: Unlocking the northern mineral belt with Waterberg as the catalyst Co-ordinating institution: Eskom Description: Unlock mineral resources as well as infrastructure such as rail, water pipelines, energy generation and transmission 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	

Item	Strategic Infrastructure Project		Engage	Report + align	Item	Strategic Infrastructure Project		Engage	Report + align
4	SIP 8: Green energy in support of the South African economy Co-ordinating institution: IDC (Industrial Development Corporation) Description: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP2010) ¹ . Support bio-fuel production facilities.	X	X		8	SIP 17: Regional integration for African cooperation and development Co-ordinating institution: To be determined Description: Participate in mutually beneficial infrastructure projects to unlock long-term socio-economic benefits by partnering with fast-growing African economies with projected growth ranging between 3% and 10%.	X		
5	SIP 9: Electricity generation to support socio-economic development Co-ordinating institution: Eskom Description: Accelerate the construction of new electricity generation capacity in accordance with the IRP2010 ¹ to meet the needs of the economy and address historical imbalances. Monitor implementation of major projects such as new power stations: Medupi, Kusile and Ingula.	X	X		9	SIP 18: Water and sanitation infrastructure Co-ordinating institution: TCTA (Trans-Caledon Tunnel Authority) Description: A 10-year plan to address the estimated backlog of adequate water to supply 1.4 m households and 2.1 m households to basic sanitation. The project will involve provision of sustainable supply of water to meet social needs and support economic growth.	X		
6	SIP 10: Electricity transmission and distribution for all Co-ordinating institution: Eskom Description: Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10 year transmission plan, the services backlog, the national broadband rollout and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity.	X	X		10	SIP 19: Water and Sanitation SIP 19: SUB-PROJECTS a. Vaal River System including Phase 2 of the Lesotho Highlands Water Project: Gauteng b. Phase 2A of the Mokolo Crocodile River (West) Augmentation Project: Limpopo c. uMkhomazi Water Project: KwaZulu Natal d. Olifants River Water Resource Development Project - Phase 2: Limpopo e. Vaal-Gamagara: Northern Cape f. Mzimvubu Water Project: Eastern Cape g. Rehabilitation of the Vaalharts-Taung Irrigation Scheme: Northern Cape & North West h. Groot Letaba River Water Development Project - Nwamitwa Dam: Limpopo i. Berg River Voëlvlei Augmentation Scheme: Western Cape j. Rustfontein Water Treatment Works: Free State k. Orange-Riet Canal Increase of Bulk Raw Water Supply: Free State	X		
7	SIP 16: SKA & Meerkat Co-ordinating institution: SKA (Square Kilometre Array) Description: SKA is a global mega-science project, building an advanced radio-telescope facility linked to research infrastructure and high-speed ICT capacity and provides an opportunity for Africa and South Africa to contribute towards global advanced science projects.	X							

Note 1. The IRP 2019 was promulgated in October 2019 and replaced the IRP 2010 as the country's official electricity infrastructure plan.

Item	Strategic Infrastructure Project	Engage	Report + align	Item	Strategic Infrastructure Project	Engage	Report + align
11	SIP 20: Energy SIP 20: SUB-PROJECTS a. Emergency/Risk Mitigation Power Purchase Procurement Programme (2000MW): National b. Small IPP Power Purchase Procurement Programme (100MW): National c. Embedded Generation Investment Programme (EGIP)-400MW: National	X	X	15	SIP 24: Human Settlements Description: SIP 24: SUB-PROJECTS a. Greater Cornubia: KwaZulu-Natal b. Vista Park II & III: Free State c. Lufhereng: Gauteng d. Malibongwe Ridge: Gauteng e. N2 Nodal Development: Eastern Cape f. Matlosana N12 West: North West g. Green Creek: Gauteng h. Mooikloof Mega Residential City: Gauteng i. Fochville Extension 11: Gauteng j. Germiston Ext 4 Social Housing Project: Gauteng k. Newcastle Hospital Street Social Housing Project: KwaZulu Natal l. Hull Street Social Housing Project Phase 1: Northern Cape m. Kwandokuhle Social Housing Project: Mpumalanga n. Phola Heights - Tembisa Social Housing Project: Gauteng o. Sondela Phase 2: Gauteng p. Willow Creek Estate: Mpumalanga q. Joe's Place Social Housing: Gauteng r. Jeppestown Social Housing Project (Unity House): Gauteng	X	
12	SIP 21: Transport SIP 21: SUB-PROJECTS a. N1 Windburg Interchange to Windburg Station: Free State b. N1 Musina Ring Road: Limpopo c. N1 Polokwane Eastern Ring Rd Phase 2: Limpopo d. N1 Ventersburg to Kroonstad: Free State (2 projects in One) e. N2 Mtunzini Toll Plaza to Empangeni T-Junction: KwaZulu Natal f. N3 Cato Ridge to Dardanelles: KwaZulu Natal g. N3 Dardenelles to Lynnfield Park: KwaZulu Natal h. N3 Paradise Valley to Mariannhill Toll Plaza: KwaZulu Natal i. N2 Edwin Swales to South of EB Cloete Interchange: KwaZulu Natal j. N3 Ashburton Interchange to Murray Road: KwaZulu Natal k. N3 Mariannhill Toll Plaza to Key Ridge: KwaZulu Natal l. N2 EB Cloete Interchange: KwaZulu Natal m. Small Harbours Development: National n. N3 New alignment via De Beers Pass: Free State o. Boegoebaai Port and Rail Infrastructure Project: Northern Cape	X					
13	SIP 22: Digital Infrastructure SIP 22: SUB-PROJECT a. National Spatial Infrastructure Hub	X					
14	SIP 23: Agriculture and Agro-processing SIP 23: SUB-PROJECTS a. Marine Tilapia Industry: Eastern Cape b. Natural Dehydrated Foods: Mpumalanga	X					

The DMRE is conducting the monitoring and progress with regard to the implementation of the IPP projects through its IPP Office. The DMRE retains the responsibility to report on programme achievements of SIP 1, SIP 8, SIP 9 and SIP 20 to the PICC structures.

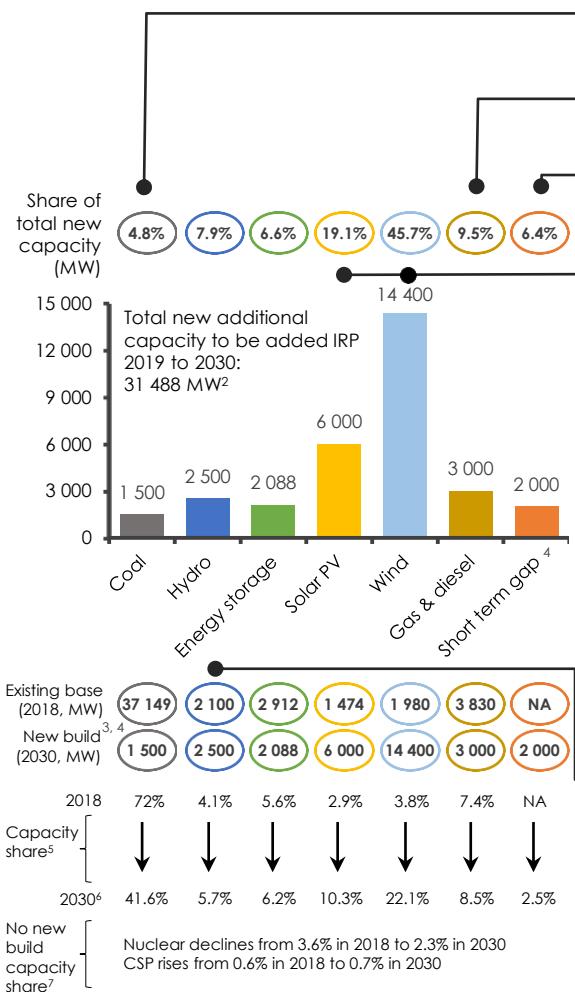


SIPS: Addressing spatial imbalances through targeted infrastructure investment, Source: Presidential Infrastructure Coordinating Commission

IPPPP Overview

Giving effect to the IRP 2019 diversified energy mix, delivery on the NDP Outcome 6 targets and IPP build mandate¹

● Denotes active programmes



Procurement and Contract management

Procurement and Contract management focus

- Coal (base load)
 - Cogeneration
- Gas
- RMIPPP

● REIPPPP (onshore wind, solar PV, CSP, small hydro, biomass, biogas, landfill gas)

Small REIPPPPs

- Cross border (hydro, coal, gas, etc.)

Contract management only focus

- Monitoring of IPPs and DMRE Peaking Plants

Advisory

Planning and strategy development inputs in support of DMRE and / or IPPPP future procurement objective:

- Gas Policy Framework
- Energy Solutions for the future including energy storage, energy impact analysis, energy financing
- Grid Development and Grid Code Enhancement
- Solar Water Heaters Repair and Replace
- Regulatory and legislative aspects impacting on the IPPPP
- Regional Co-operation

Note 1. Ministerial determinations made under IRP 2010 for capacity that has not already been contracted before the promulgation of the IRP 2019 has expired. New Ministerial determinations will give effect to the capacity allocations in the IRP 2019. Two new Ministerial determinations have been promulgated to date. In May 2020, NERSA concurred with a new ministerial determination for the procurement of 2 000 MW from 2019 to 2022 to fill the short term gap. In September 2020, NERSA concurred with the second determination for 13 813 MW of new IPP generation capacity to be procured under IRP 2019 from coal (1 500 MW), gas (3 000 MW), wind and solar (6 800 MW) and battery storage (513 MW). **Note 2.** 29 488 MW new additional capacity from 2022 to 2030 and 2 000 MW short-term capacity gap in 2019 to 2022 as identified in IRP 2019. **Note 3.** New builds includes all committed or already contracted capacity and additional new capacity as identified in IRP 2019. **Note 4.** Short term gap represents a range of energy technologies to close an immediate 2 000 MW gap between 2019 and 2022 as identified in the IRP 2019. **Note 5.** Energy share 2030 takes into consideration decommissioned coal units of 11 017 MW and previously committed or already contracted capacity of 8 208 MW. **Note 6.** Share of total installed capacity by 2030, including the 2 000 MW short term capacity gap that needs to be filled. **Note 7.** Koeberg nuclear power plant's lifetime extension in 2024 is not considered additional new capacity since it (1 860 MW) is already included in the total installed capacity base in 2018. CSP share of total installed capacity rises marginally due to being committed or already contracted capacity (300 MW in 2019) prior to the promulgation of IRP 2019.

Appendix B

Reference component

Interpretation notes

These notes document the reporting conventions and terms as defined and practiced by the IPP 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.

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

Note 1. National targets

N1. National targets for renewable energy have been set in the Integrated Resource Plan (2019) as:

- Total renewable energy capacity developed by 2030: 26 804 MW²
- Total renewable energy procured by 2024: 13 204 MW.

Ministerial determinations give effect to the capacity allocations stipulated in the IRP. All Ministerial determinations made within the ambit of the IRP 2010 for electrical capacity, that has not already been contracted before the promulgation of the IRP 2019, has been nullified.

The second determination made under the IRP 2019 includes the procurement of 6 800 MW from solar and wind.

The combined capacity procured in BW1, 2, 3, 3.5, 4, 1S2 and 2S2 (i.e. 6 422 MW) represents approximately 49% of the 2024 target for renewable energy procured and 24% of the 2030 target for renewable energy capacity developed.

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 IPP 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.
- **Bid windows** represent rolling rounds in which IPPs are procured according to a specified technology mix and capacity targets / limits.

Note 1. Notation indicates additional notes and observations available in Appendix. **Note 2.** 8 288 MW solar, 17 742 MW wind, 600 MW CSP and 174 MW from other technologies such as landfill gas, small hydro and biomass, already contracted / installed.

- **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 IPP Office.

Note 5. Unaudited data

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

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

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

Note 6. Construction vs operations period and spend patterns

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

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

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

Note 6. (continued)

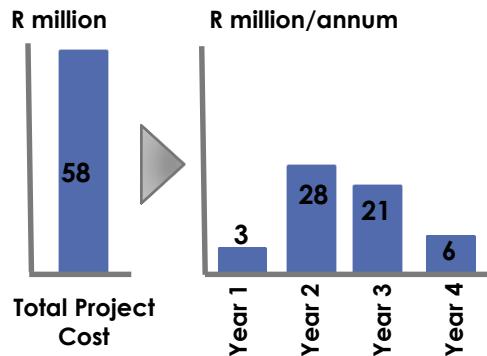
Two important examples are highlighted for clarification:

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

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

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

Typical construction spend profile



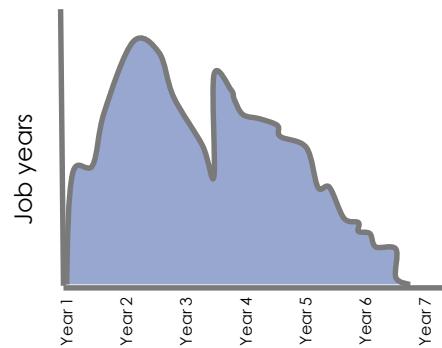
The spend (and labour) requirements of the **operations period** are expected to have a more steady pattern related to production and maintenance of the plant, sustained over 20 years.

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 IPP Office is currently done in **job years** i.e. the equivalent of one person full time (i.e. defined in the IA as 174 hours per month for BW1 and BW2 and 160 hours per month for BW3, BW3.5, BW4, 1S2 and 2S2)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 IPP 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 consists of a base rate and a peak rate component. The BW3 rate has therefore been adjusted to incorporate an estimated share of energy generated during contracted peak when the base rate applies.

The calculations above remain **only an estimate** as:

1. Projections of annual energy production are subject to a range of variables and are by nature uncertain.
2. The technology price average is a simple average, without consideration of the respective IPP's energy contribution.
3. The relative share of base vs peak energy that will be supplied by the CSP IPPs (share to which peak rate will apply) is an estimate.

Note 9. Quarter convention

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

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

Where reference is made to a calendar quarter, such exceptions will be indicated as such.

B4

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.

$$\text{If a } 1 \text{ MW}_p \text{ wind turbine runs for 1 hour} \quad \text{it produces a total of } 1 \text{ MWh of energy}$$

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

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

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

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

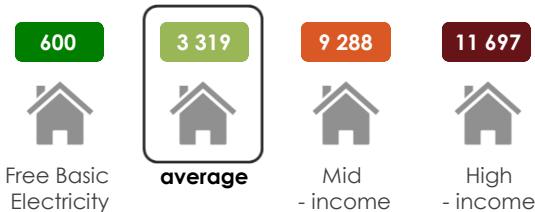
Similarly, on the consumer side, the energy consumption differs amongst households.

B5

$$\text{If a } 1 \text{ kW appliance runs for 1 hour} \quad \text{it uses a total of } 1 \text{ kWh of energy}$$

The more appliances a household has and uses, the higher its energy consumption is likely to be. High energy use is therefore typically associated with higher 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.

Then **1 GWh** will provide power to approximately



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:

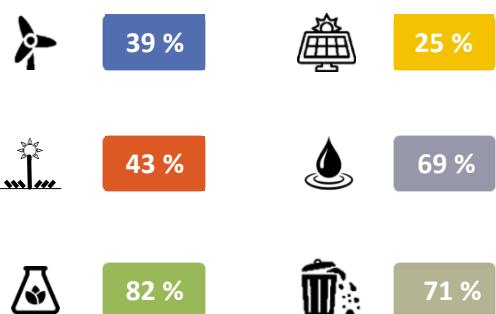
Number of households per technology type (1 MW unit) (thousand)

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
	3.9	6.5	1.2	0.4	0.3
	2.3	3.8	0.7	0.2	0.2
	6.4	10.7	1.9	0.7	0.5
	5.6	9.3	1.7	0.6	0.5
	5.5	9.1	1.7	0.6	0.5

For the portfolio of REIPPPs in BW1 – 2S2 the average capacity factors, as contracted, per technology type, vary from 25% - 82%.

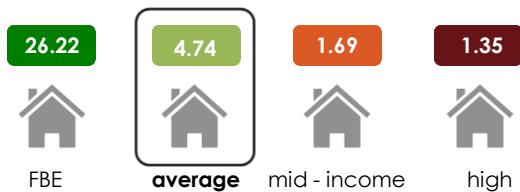
Average capacity factors¹

Percentage per technology type



Energy that will be generated **over a full year of operation²** by those IPPs that are already operational is projected to be 15 732 GWh. This power, that is already available to the system, would be adequate to supply:

Total projected number of households million



This represents 4.74 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 GWh	number of homes '000				
		FBE	average	mid - income	high	
	2 513	7 871	13 118	2 371	847	673
	2 216	5 101	8 502	1 537	549	436
	500	1 662	2 770	501	179	142
	14	86	144	26	9	7
	8	27	44	8	3	2

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

Note 1. Capacity factors provided by projects at bid submission / financial close were used to determine an 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 26 MW below contracted capacity (2 MW of this shortfall relates to two sites of a landfill project that was terminated, following an exemption granted by the Department in December 2019).

Note 12. The REIPPPP competitive bidding procurement process

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

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.

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 DMRE and the Lenders (or their agent) in relation to the PPA and the Implementation Agreement.
- **“FTE”** means Full Time Equivalent Employment Created. It refers to one person-year of employment. In this report the EPWP definition is used where one person year is equivalent to 230 person days of work. The 230 days are effective days of work after subtracting provision for non-productive days in a year (e.g. leave, holidays, etc.).

Definitions and terminology

B9

- “**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.
- “**Implementation Agreement**” means the implementation agreement to be entered into between the Seller and the DMRE.
- “**Local Content**” means the portion of the Total Project Value that is in respect of South African Products.
- “**NERSA**” – refers to the National Energy Regulator of South Africa, established pursuant to Section 3 of the National Energy Regulator Act, 40 of 2004.
- “**Operating Expenditure**” means any expenditure treated as operating expenditure under GAAP.
- “**Operating Period**” means the period from the later of the Commercial Operation Date and the Scheduled COD to the Termination Date.
- “**Overnight Cost**” refers to the cost of a construction project if no interest was incurred during construction, as if the project was completed “overnight” (see also Total Project Cost, definition B).
- “**PPA**” means the power purchase agreement to be entered into between a Project Company, as the Seller, and the Buyer pursuant to the IPP Procurement Programme.
- “**P50 / P90**” – refers to probabilities for annual energy production which are expressed as P values. A P50 figure is the level of generation that is forecasted to be exceeded in 50% of years over a 10 year (or sometimes 20 year) period. Similarly, a P90 figure is the level of generation that is forecasted to be exceeded in 90% of years over a 10 year period – in other words, the risk that an annual energy production of P90 is not reached is 10%.
- “**Procurement spend**” – refer to “Total Amount of Procurement Spend”.
- “**Total Amount of Procurement Spend**” means the monetary spend on the procurement of goods and services for purposes of undertaking the Project Activities (without double counting), excluding costs of imported goods and services, taxation, salaries and wages.
- “**Total Project Cost**” means:
 - (a) for the purposes of calculating the Development Fee, an amount equal to the aggregate of the total Debt and Equity which is, as at the Signature Date, forecast in the Financial Model to be contributed up to the Commercial Operation Date; and
 - (b) for all other purposes, the total capital expenditure to be incurred up to the commercial operations date in the design, construction, development, installation and/or commissioning of a project, which is equal to the total debt and equity related to a project as reported at commercial close.
- “**Total Project Value**” means the total project cost that involves the capital costs and costs of services procured for the construction of a project, but excludes finance charges, land costs, mobilisation fees to the operations contractor and the costs payable to the distributor, national transmission company and/or a contractor for the distribution or transmission connection works.

Other definitions and terminology used in this report

- **Job years.** Employment / Job creation is reported in job years (i.e. the equivalent of a full time employment opportunity for one person for one year; i.e. defined in the IA as 174 hours per month for BW1 and BW2 and 160 hours per month for BW3, BW3.5, BW4, 1S2 and 2S2).
- Employment numbers are expressed as a percentage of the sum of StatsSA reported employed and unemployed numbers.

Glossary of icons

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



Gross Domestic Product (percentage indicating the contribution share)

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



Agriculture



Mining



Manufacturing



Electricity



Construction



Trade and



Transport



Finance



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]

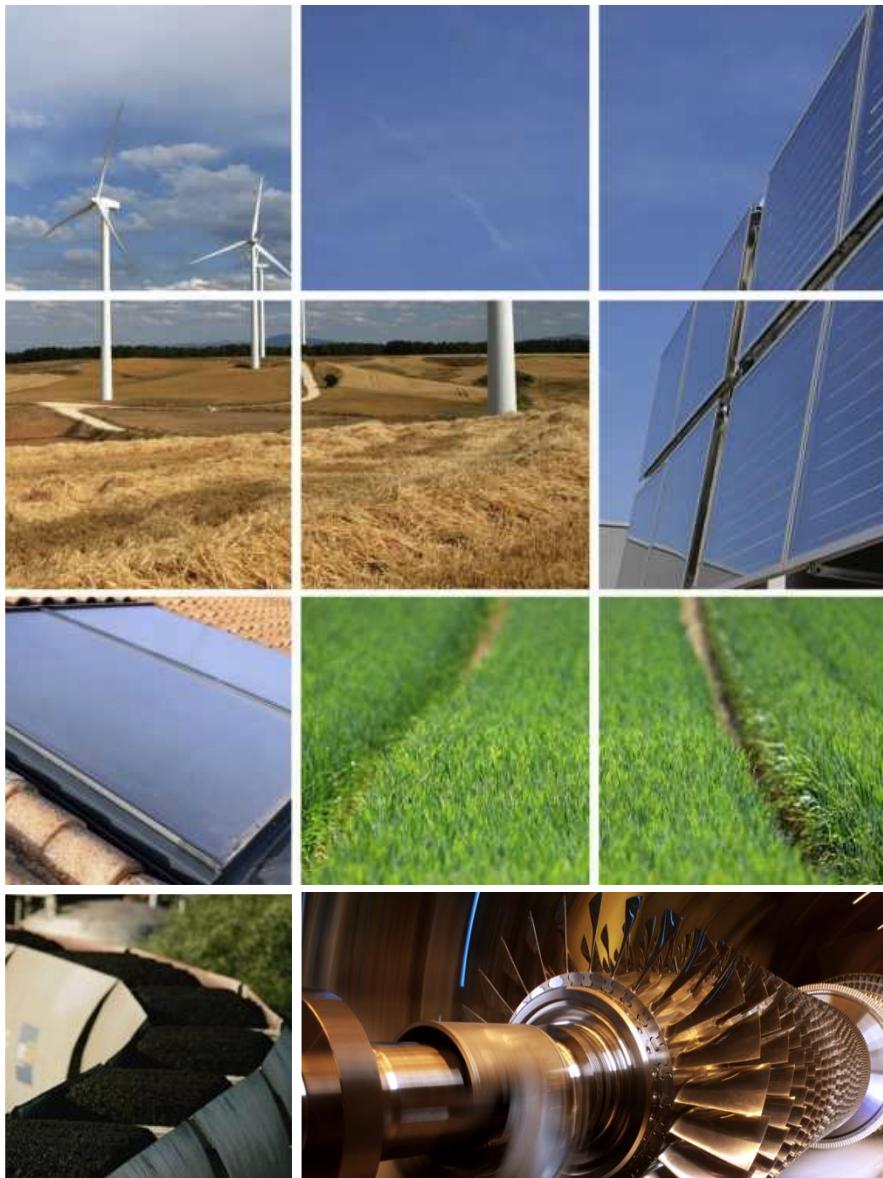
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