

at a glance



REIPPPP focus on Eastern Cape

Provincial Report Volume 2

June | 2018

The IPPPP partnership between



energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA



national treasury

Department:
National Treasury
REPUBLIC OF SOUTH AFRICA



DBSA

Development Bank
of Southern Africa

Overview of the Provincial Report

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

The programme's primary mandate is to secure electrical energy from the private sector, drawing from both renewable and non-renewable energy sources. Energy policy and supply are not only about electrons, fuel and carbon technologies. In reality, it is rather a matter of socio-energy system design, as energy systems are deeply embedded in the broader patterns of socio-economic factors, political life and organisation. Consequently, the IPPPP has not only been designed to procure energy, but also to contribute to the broader national development objectives of job creation, social upliftment and the broadening of economic ownership.

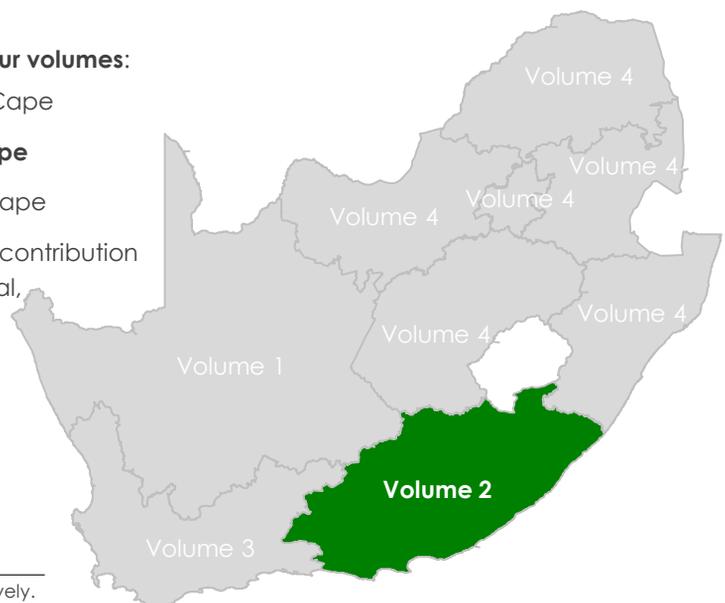
The purpose of the Provincial Report is to provide a high level, "at a glance" overview of the Independent Power Producers Procurement Programme (IPPPP) activities per province. Due to the advanced implementation status of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) relative to other energy source-based programmes, it is largely focused on the REIPPPP.

The REIPPPP projects of the first seven bid windows (BW1, BW2, BW3, BW3.5, BW4, 1S2¹ and 2S2¹) were distributed across all nine provinces of South Africa. By nature, the distribution of IPPs depends on the location where renewable energy resources offer the most potential for any particular technology. As such, the geographic spread of various IPPs varies throughout the country according to the resource potential – e.g. the Eastern Cape offers some of the best wind conditions in the world for onshore wind-to-electricity generation, and likewise the Northern Cape for solar electricity generation. Overall, most renewable power plants are located in the rural areas of the Northern, Eastern and Western Cape.

Project distribution and numbers informed the development of four Provincial Report components. Individual report components are available for the Northern, Eastern and Western Cape provinces, where most projects are concentrated. The combined contribution across the remaining six provinces is incorporated into a single volume.

The **Provincial Report** is, therefore, available in **four volumes**:

- **Volume 1:** REIPPPP focus on the Northern Cape
- **Volume 2:** REIPPPP focus on the Eastern Cape
- **Volume 3:** REIPPPP focus on the Western Cape
- **Volume 4:** REIPPPP focus on the collective contribution from the Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga and North West Province.



Note 1. 1S2 & 2S2 refers to Smalls BW1 and Smalls BW2 respectively.

Purpose and outline of this report

The purpose of this report is to provide a high level “at a glance” overview of the IPPPP activities in the **Eastern Cape** province, with the focus on the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) as the most advanced component of the IPPPP.

The IPPPP is anchored within the overall South African policy framework, notably the:

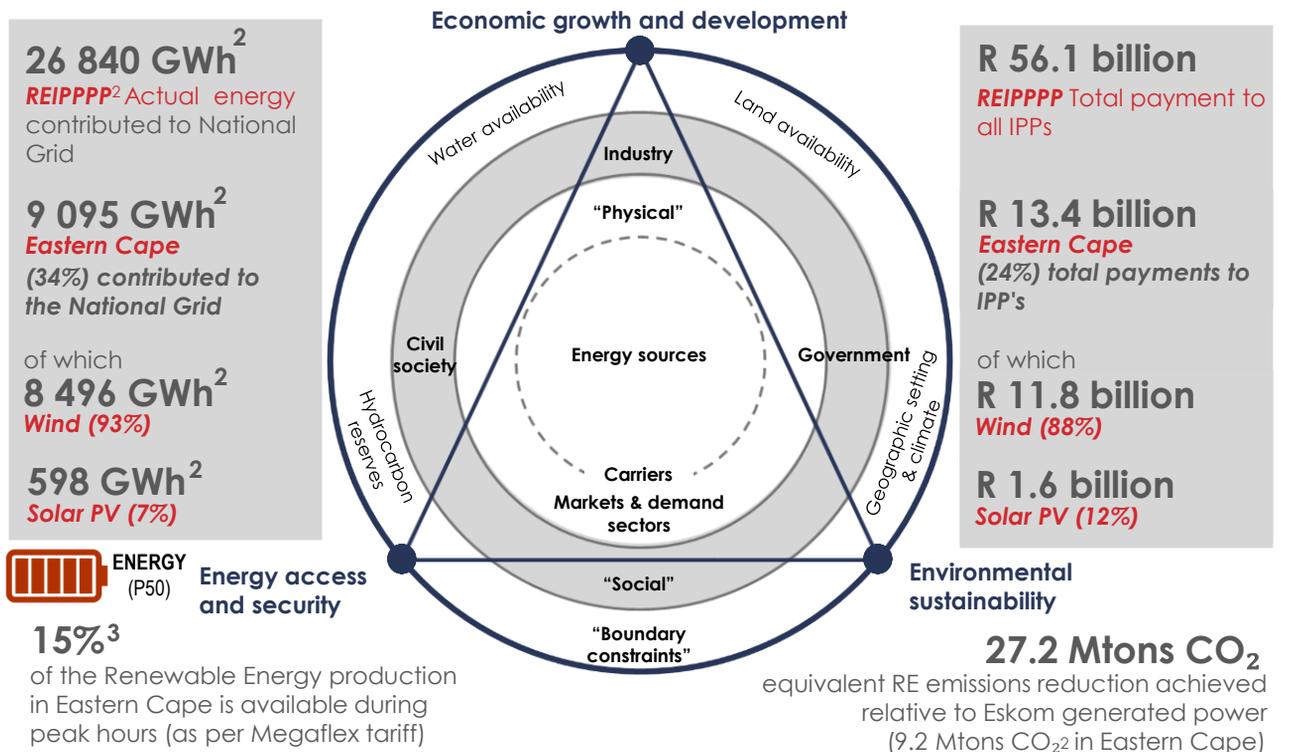
- Respective White Papers on Energy Policy (1998) and Renewable Energy (2003);
- The Electricity Regulation Act (2006) and National Environmental Management Act (1998);
- The South African National Development Plan (NDP);
- The Integrated Energy Plan (IEP); and
- The Integrated Resource Plan (IRP) 2010 for Electricity.

The REIPPPP incorporates the different technologies identified in the IRP 2010, including onshore wind, solar photovoltaic (PV), concentrated solar power (CSP), biomass, biogas, landfill gas and small hydro.

This report provides highlights of the IPP project portfolio procured to date under the REIPPPP's Bid Windows (BW) 1, 2, 3, 3.5⁴, 4, 1S2 and 2S2 in the Eastern Cape.

The **first section** of the report highlights IPP commitments and contributions that are already being realised in the Eastern Cape province (as at June 2018). The **second section** gives a brief overview of the economic status and socio-economic features of the Eastern Cape, and contextualises the energy capacity and the economic contribution of the REIPPPP in the province relative to the total national programme. The **third section** gives more information on the REIPPPP at the municipal level where projects are located. The **Appendix** contains relevant notes and observations, definitions and an index of icons.

Key REIPPPP Energy Triangle¹ Facts: Eastern Cape (for period 11/2013 – 06/2018)

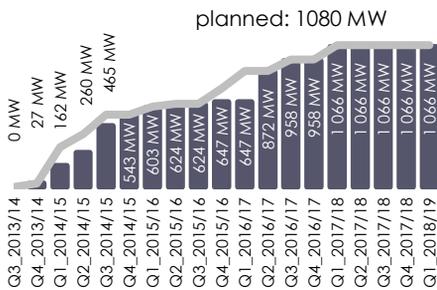


Note 1. Source: World Economic Forum – Global Energy Architecture Performance Index Report (2013). **Note 2.** Energy (and carbon emissions) figures understated. Latest quarterly figures not received from some IPPs. **Note 3.** Percentage figure correct as at end June 2018 as updated figures not available. **Note 4.** No projects in the Eastern Cape; all BW3.5 projects are located in the Northern Cape.

Highlights for the EC

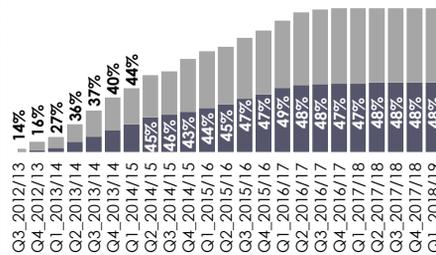
Key statistics | major achievements of the REIPPPP in the EC as at June 2018

megawatts operational (MW)



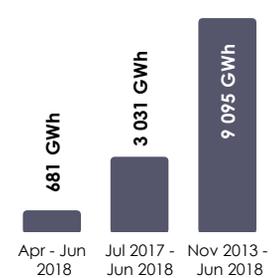
REIPPs in the EC have consistently contributed new capacity to the network since the beginning of 2014. As at end June 2018, **100%** of the IPPs scheduled¹ to be operational have started commercial operations. The average lead time to complete these 13 projects has been 2.2 years.

local content achieved in construction



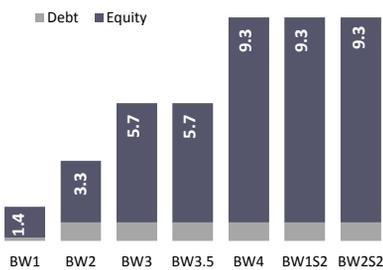
Local content is reported as a percentage of Total Project Value² achieved during construction. Local content achieved in the EC up until this quarter was 48% of Total Project Value.

clean energy generated^{3,6} (GWh)



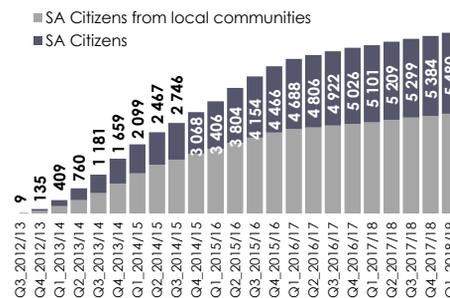
Although production is only ramping up as IPPs become operational, 9 095 GWh⁶ have already been generated by the renewable energy portfolio in the EC from inception to date - thereby offsetting 9.2 Mton CO₂ emissions^{4,5}. In this quarter alone, the projects generated 681 GWh⁶.

investment attracted (cumulative R billion)



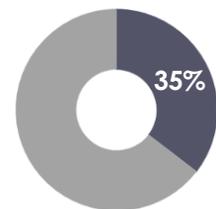
The total foreign equity and financing invested in REIPPs (BW1 - BW4, 1S2 & 2S2) in EC reached R9.3 billion. This is 19% of total investment attracted into SA by the REIPPPP.

employment creation³ (job years)⁵



Employment for South African citizens including people from communities local to the IPP operations in the EC were 5 480 job years as at end June 2018.

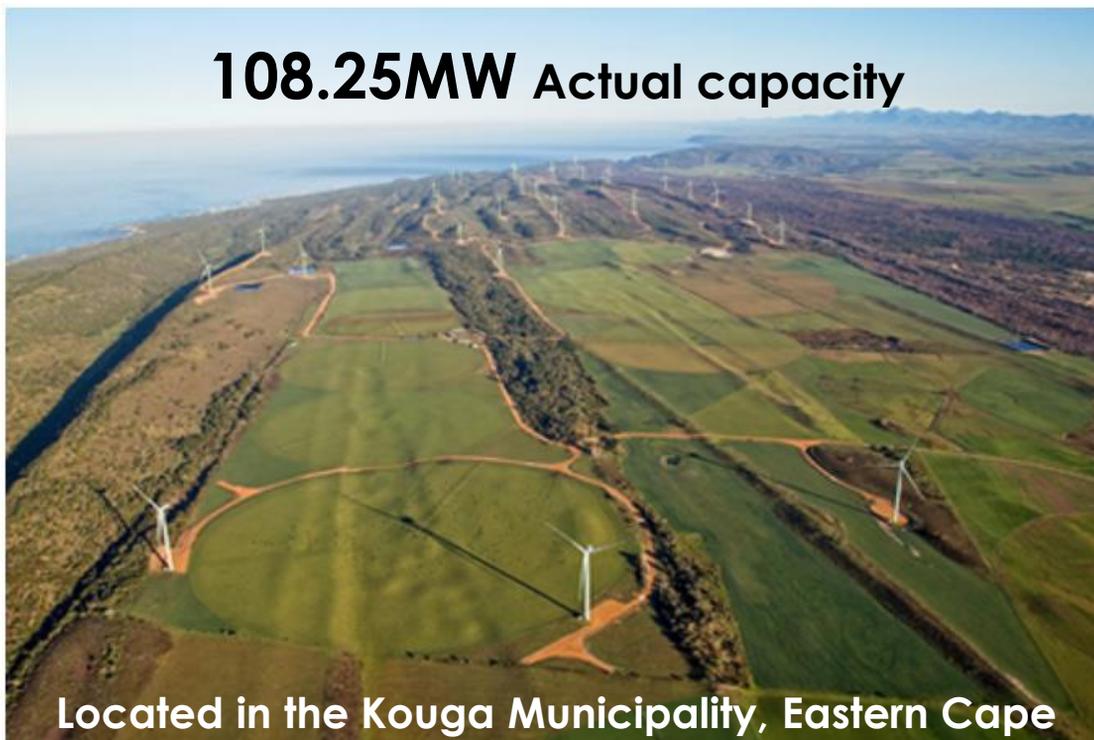
equitable shareholding (%)³



Black South Africans hold 35% of the shares across the complete supply chain (for the 13 projects in BW1, BW2 and BW3). Local communities hold 18% equity in the IPPs of BW1, BW2 and BW3.

Note 1. 13 IPPs (out of 13 that were originally planned) have reached commercial operation date (COD) in the province by end December 2017. **Note 2.** Refer Appendix A for applicable definitions and terminology. **Note 3.** For actual achievements only data for Active projects are reported - referring to all projects that have commenced construction i.e. currently BW1, BW2, BW3 (13 of 17 projects) and BW3.5 (1 of 2 projects; no projects in EC). BW4, 1S2 and 2S2 have not completed financial close. **Note 4.** Carbon emission reductions reflect all energy generated in EC from inception to date. **Note 5.** Employment / Job creation measured in job years (equivalent of a full time employment opportunity for one person for one year). **Note 6.** Energy (and carbon emissions) figure understated. Latest quarterly figures not received from some IPPs.

The Eastern Cape's newest operational Wind Farm



Red Cap Gibson Bay

Started commercial operations on 28 April 2017



27
months
Time to construct



566 jobs¹

Created for SA citizens during construction and operations⁴



464 GWh

Wind power generated by project to date²



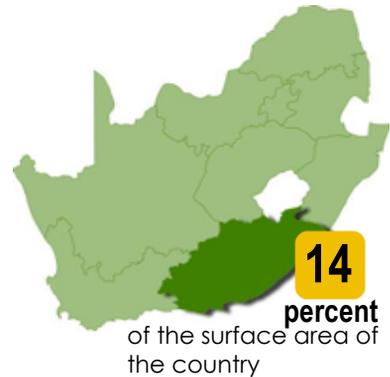
139 867 households³



Note 1. Employment / job creation measured in job years (equivalent to a full time employment opportunity for one person for one year). **Note 2.** Energy generated by project from 7 February 2017 (when early operations started) until 30 June 2018. **Note 3.** Average households powered to date is based on energy produced from 7 February 2017 to 30 June 2018 (using -3319 kWh/a/hh).

Eastern Cape

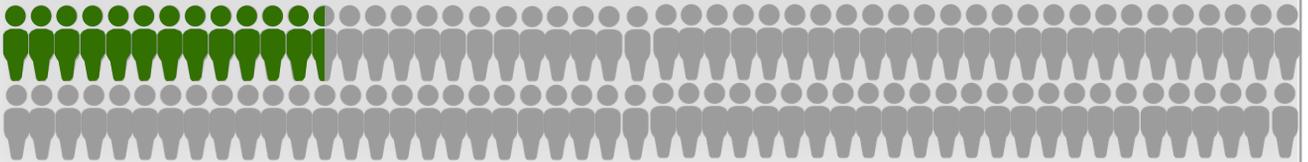
Harnessing wind energy for sustainability



Key provincial attributes

The Eastern Cape has the second largest **geographic footprint** of all provinces in South Africa, covering 14% of the country's surface area. The province is home to 7 million people or 12.6% of the total South African **population** of 55.7 million. This translates into an average **population density** of 41 people per km² in the province, which is only slightly below the national average of 46 people per km².

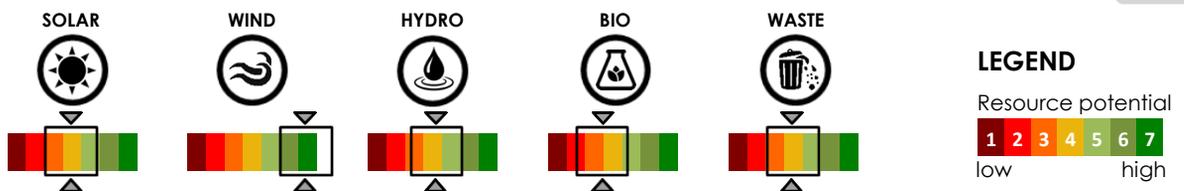
12.6 of every 100 South Africans live in the Eastern Cape | 41 people per km² vs national average 46 people per km²



The province offers remarkable biodiversity with 7 of the 8 biomes in South Africa found here. This wealth of natural resources has given rise to strong growth in tourism in the region over the last two decades. In recognition of this ecological advantage, the province has appropriately included sustainability and the development of a 'green economy' into the provincial strategies and development plans. In its Sustainable Energy Strategy¹ the province articulated the vision to provide the most enabling environment for sustainable energy investment and implementation in South Africa through encouraging sustainable, affordable and environmentally friendly energy production and efficient use and by creating an enabling environment for sustainable technology, skills and industry development.

In addition to a favourable enabling environment, the availability of land and renewable energy resources makes the province particularly suited for **electrical power generated from renewable energy**, especially from wind. Besides its excellent wind potential, the province has also identified potential for bio-fuels production and electrical power generation from small hydro, solar, biomass and possibly tidal or wave energy².

N1³



All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2016 Estimates. **Note 1.** Adopted by the Eastern Cape Provincial Government in 2012. **Note 2.** With consideration of wind and solar resource maps (refer Appendix to this report), scales indicative only, based on the Eastern Cape Sustainable Energy Strategy. **Note 3.** Notation indicates additional notes and observations available in the Appendix (Reference Component) to this report.

Key economic attributes¹

The Eastern Cape province contributes 7.8% to national GDP, which is below potential considering its geographic footprint, natural resource endowments and population size.

While government services is the dominant sector in the province's economy, financial services and trade and manufacturing also contribute significantly to total provincial output. The province has a relatively diverse economy, but economic activity is largely concentrated around the urban centers of Nelson Mandela Bay and Buffalo City. However, the province is exploring opportunities for economic development in the remainder of the province. In addition to this, electrical power generation presents an excellent opportunity to enhance economic activities in rural areas.

The province has two large airports, two prominent seaports and a relatively good road network along the coastal strip, but the condition of the road network in rural areas and the high voltage transmission network in the former Transkei remains poor. As a result, the accessibility of the interior is problematic and may impede the development of new power infrastructure under the IPPPP in rural areas. Transportation and regional development growth corridors have been identified, as well as plans to strengthen the transmission grid, but prioritised delivery on these plans will be critical to fully capture the opportunities offered by the REIPPPP.



Employment¹

The province has a comparatively high official unemployment rate at 29.1% relative to the overall official unemployment rate for South Africa of 25.5%, but has decreased slightly from 29.4% in 2015. Nonetheless, approximately 4 out of 5 people in the province's economically active population are employed.



4

out of
fiveeconomically active persons (EAPs)
in the Province are **employed**

During 2016 the largest employer in the province was the community and social services sector which accounts for 30.2% of the labour market in the province. Thereafter, most employment opportunities were offered within the trade sector (20.6%), finance (20.0%), private households (29.6%), manufacturing (12.0%), agriculture (2.0%), construction (4.3%), transport (9.1%), electricity (2.1%) and mining (0.2%).

Job creation and skills development is one of the six main goals identified by the Sustainable Energy Strategy for the province. While the proportionate share of people employed in the utilities sector is low, investment in the electrical energy industry in the province as a result of the IPPPP **contributes direct and indirect employment** during construction and operation. The Strategy also recognised employment opportunities in manufacturing and supporting industries associated with the electrical energy industry and the development of new electricity generation capacity. The province is therefore proactively promoting renewable energy manufacturing and technology development opportunities and positioning the Coega industrial development zone (IDZ) as the 'green' technology hub in South Africa in this regard.

Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2016 Estimates.

IPPPP in the Eastern Cape

Building energy supply capacity

ENERGY
(P50)



5 133
gigawatt hours / a

5.2 CO₂
M ton/a

CAPACITY



1 509
megawatts

24 of total capacity procured
percent

8

The Eastern Cape has attracted almost a fifth of the IPPPP projects to date. The electrical energy that will become available from the investments in bid windows 1, 2, 3, 3.5, 4, 1S2 and 2S2 will equate to almost 60% of the Eastern Cape's own needs.

Capacity contribution

The Eastern Cape consumed **9 217 GWh electricity in 2017** or 4.1% of the national total (224 804 GWh)¹. With the newly developed IPP capacity (procured in BW1 to BW4, 1S2 and 2S2), the province will produce approximately 56% of its own electrical power needs from renewable energy sources (although in practice this energy will be fed into the national grid).

The IRP 2010 contains a target of 17.8 GW of renewable energy capacity by 2030, of which 7 GW needs to be operational by 2020 (5 GW by 2019 and a further 2 GW by 2020)⁴. At the national level, 6 422 MW has been procured from 112 IPPs under the REIPPPP to date. Of these, 62 IPPs are operational which have established 3 776 MW of capacity (against a contracted capacity 3 799 MW) and generated 26 840 GWh⁷ of electricity since inception. The Eastern Cape accounts for 1 509 MW (24%) of procured capacity, of which 1 066 MW (28% of national total) electrical energy capacity is operational, with 9 095 GWh⁷ (34%) electricity generated by the total provincial portfolio since inception.

Eastern Cape renewable energy projects in BW1 to BW4, 1S2 and 2S2 will save a gross Eskom grid equivalent of 9.2 million tonnes CO₂ emissions² per annum.

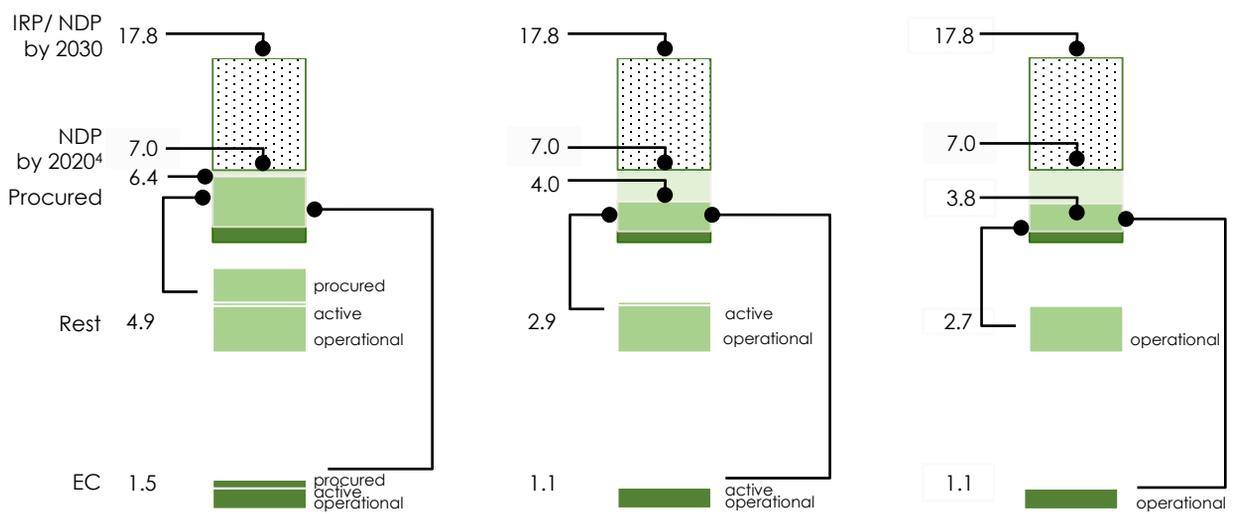
Procured⁵
Capacity (GW)³



Active (have reached FC)⁶
Capacity (GW)³



Operational
Capacity (GW)³



17 of the 112 projects procured in bid windows 1 to 4, 1S2 and 2S2 are in the EC

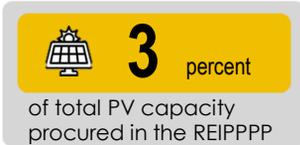
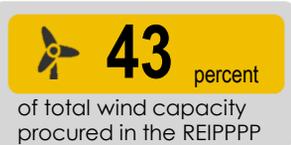
13 of the 64 active projects are in the EC

13 of the 62 operational projects are in the EC

Note 1. Stats SA P4141: Electricity generated and available for distribution (201806). **Note 2.** Calculated based on average Eskom equivalent emission factor of 1.015 kg CO₂-equivalent per kWh, expressed as Million tons per annum (Energy Research Centre, UCT). **Note 3.** Cumulative capacity towards IPPPPP and IRP targets. **Note 4.** Breakdown of targets set out in Appendix notes. **Note 5.** Projects for BW1, 2, 3, 3.5, 4, 1S2 and 2S2. **Note 6.** Projects in BW3 and BW3.5 (1 project each), BW4, 1S2 and 2S2 have not yet reached financial close. **Note 7.** Energy (and carbon emissions) figure understated. Latest quarterly figures not received from some IPPs.

IPPPP in the Eastern Cape

Building energy supply capacity



LEGEND

- █ Province
- █ Rest of programme
- Not operational yet at time of reporting
- Operational

The Eastern Cape has attracted 43% of the total wind capacity procured in BW1 to BW4, 1S2 and 2S2 under the REIPPPP in South Africa, contributing 1 440 MW of the national total 3 366 MW wind power. Of the 17 renewable energy IPPs in the province, wind has the dominant share with 16 wind IPPs or 95% of total IPP capacity, with only one sizable solar PV project of 70 MW.

Technology contribution

Procured (BW 1 to 2S2)



of which:

Active²



of which:

Operational³



of which:

Procured (BW 1 to 2S2)			Active ²			Operational ³		
no. projects	% share ¹ rest EC 100 -	megawatts	no. projects	% share ¹ rest EC 100 -	megawatts	no. projects	% share ¹ rest EC 100 -	megawatts
0		0	0		0	0		0
1	97 3 	70	1	95 5 	70	1	95 5 	70
16	57 43 	1 440	12	49 51 	1 010	12	50 50 	997
0	100 - 	0	0	100 - 	0	0	100 - 	0
0	100 - 	0	0	100 - 	0	0	100 - 	0
0	100 - 	0	0	100 - 	0	0	100 - 	0

Note 1. EC share (green bar/fill) vs. remainder of programme (other 8 provinces). **Note 2.** IPPs that have reached financial close.

Note 3. Operational capacity achieved has fallen 14 MW short of contracted capacity (1 080 MW).



Investment share of the IPPPP attracted into the Province



33.8
Rand billion

Invested (programme total: R 201.8 billion)

7.4
Rand billion

Community net income

The Eastern Cape has attracted 16.7% of the total IPPPP investments to date and has secured a substantial share of the equity for local communities with benefits materialising over the project life¹.

Investment share

The province attracted 16.8% of the total IPP investments in bid windows 1, 2, 3, 3.5, 4, 1S2 and 2S2. The combined IPP investment share of the province, across BW1 to BW4, 1S2 and 2S2, would be equivalent to 10% of the Eastern Cape's annual gross domestic production (R339 billion).

By June 2018, the **project value**⁴ that had been realised in the EC totaled R14.3 billion.

Procured (BW1 to 2S2)²



Active

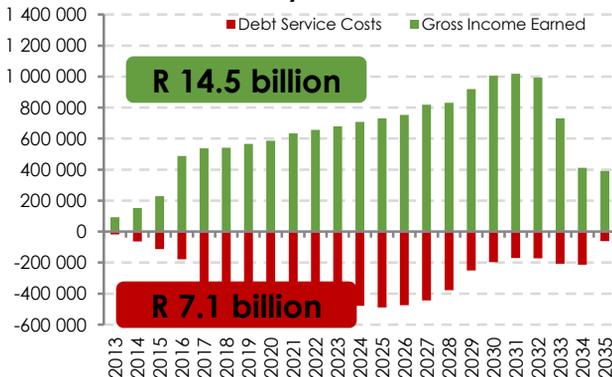


Achieved

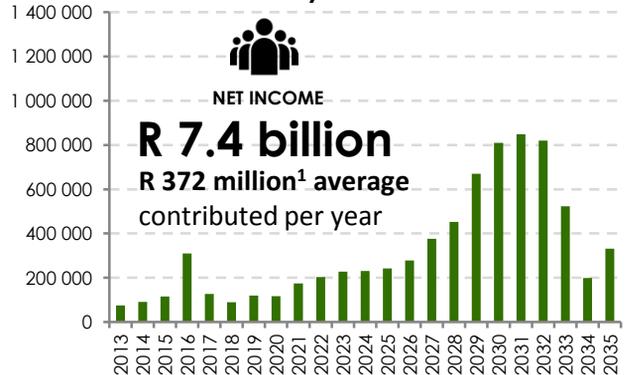


A substantial portion of these investments have been structured and secured as local equity. Individual communities' dividends earned will depend on the terms of each transaction corresponding with the relevant equity share. The aggregate impact of BW1 to 4, 1S2 and 2S2 investments and earnings projected for local communities associated with the projects in the province (accrued over 20 years) present a net income of R7.4 billion.

ZAR Million Community Trusts - Income & Costs



ZAR Million Community Trusts - Net Income



Note 1. Note that all financial values are reported for the **full expected project lifespan of 20 years**. The bulk of the money will only start flowing into the communities from 2028 due to debt repayment obligations in the preceding years. **Note 2.** Projects for BW3 and BW3.5 (one project each), BW4, 1S2 and 2S2 have not yet reached financial close. **Note 3.** Eastern Cape share (green bar/fill) vs. remainder of programme (other 8 provinces). **Note 4.** Project value indicative of progress against committed investment; refer definitions in Appendix A for Total Project Value and Total Project Costs.



Project cost



Community trust (local equity)

Economic development resulting from the IPPPP and the sizable wind component in particular



25.1 Procurement spend (programme total: **R 147.6 billion**)
Rand billion

10.8 Locally procured (programme total: **R 67.1 billion**)
Rand billion

Clean energy production supported by the procurement strategy of the REIPPPP is contributing directly to the Eastern Cape's provincial objective of building sustainable energy, stimulating a 'green' economy and achieving sustainable economic growth and development.

Procurement spend

The committed procurement spend in the Eastern Cape, during both construction and operation, amounts to R 25.1 billion or 17% of the total committed procurement spend of the programme. Of this, R8.4 billion (34%) has already been spent.

Committed (BW 1 to 2S2)²

25.1

Rand billion
Procurement spend



Achieved against committed

Planned



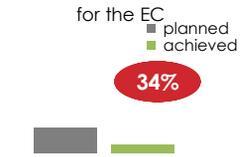
Active



Achieved



Achieved vs planned



Localisation share

41% of the total project value¹ in the Eastern Cape has been allocated for local procurement, with the intent of stimulating the development of localised industries and the 'green' economy. By this reporting quarter, 64% of the committed local spend had already been realised.

10.8

Rand billion
Localisation spend



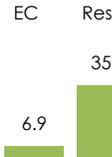
Planned



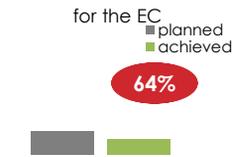
Active



Achieved



Achieved vs planned



Enterprise development

The development of local enterprises will further be directly supported with an allocation earmarked for enterprise development over the projected portfolio development and operations horizon. The commitments made towards **local** enterprise development in the province for BW1 to BW4, 1S2 and 2S2 is R1.2 billion. This contribution will accrue over the operational life of the projects which has only started. As a result, only a small percentage has been realised at this early stage of the 20-year portfolio operational life.

1.2

Rand billion
Enterprise development commitment (local)



Planned



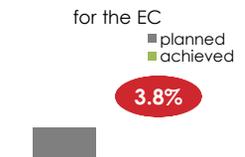
Active



Achieved



Achieved vs planned



Note 1. Refer Total Project Value definition in Appendix (Definitions). **Note 2.** Projects for BW3 and BW3.5 (one project each), BW4, 1S2 and 2S2 have not yet reached financial close. **Note 3.** Eastern Cape share (green bar/fill) vs. remainder of programme (other 8 provinces).



Procurement



Localisation



Economic Development



Local community

Employment creation in the Eastern Cape by the IPPPP



9 516



job years¹

out of a programme total of 60 847 job years within **local communities**

12

The Eastern Cape benefits from the employment opportunities created during the construction and operation of IPPs. The province also captures a high share of the total employment created under the REIPPPP as a result of the large number of IPP projects that are located within the province.

Employment creation

As for the rest of the country, employment creation remains a top priority in the Eastern Cape. IPP investments in BW1 to BW4, 1S2 and 2S2 within the province alone have contributed new employment opportunities for **South African citizens**² estimated to 18 137 job years over the construction and projected operational life of the plants.

Approximately 16% of the total jobs created for SA citizens under the overall REIPPPP, in BW1 to BW4, 1S2 and 2S2 (114 266 job years), will therefore be created by IPP projects located in the Eastern Cape province.

N4

Committed (BW 1 to 2S2)⁴

4 849

Construction job years of total 18 137 job years

rest | EC³

86 | 14



Achieved cumulative against planned (Job years)

Construction employment



94%

of planned job opportunities in the EC realised

Notably, 2 059 or 42% of these new employment opportunities have been retained within **local communities** (in the province) associated with the respective IPP plants. To date, the opportunities for people from local communities have significantly exceeded expectations, achieving **117% of what is planned across all 7 BWs**.

2 059

Job years



rest | EC³

85 | 15



Local construction employment



117%

of planned job opportunities in the EC realised

During the construction phase (2 – 4 years) the number of people employed on site typically spikes and then tapers off to a lower and more steady employment number over the extended 20 year operational life of a project. Although lower in numbers, these opportunities are both sustainable and in environmentally friendly firms, thereby contributing to the national objective of creating 'green' jobs, and will accrue over 20 years. At this early stage, already 915 job years have been created by the IPPs that started operation.

13 287

Operations job years of total 18 137 job years

rest | EC³

83 | 17



Operations employment



6.9%

of planned job opportunities in the EC realised

Note 1. Job year = equivalent of a full time employment opportunity for one person for one year. **Note 2.** Employment numbers for South African citizens residing in the Eastern Cape shown. **Note 3.** Eastern Cape share (green bar/fill) vs. remainder of programme (other 8 provinces). **Note 4.** Projects for BW3 and BW3.5 (one project each), BW4, 1S2 and 2S2 have not yet reached financial close.



Employment



Local community

Socio-economic benefits resulting from the IPPPP



4.5
Rand billion⁴

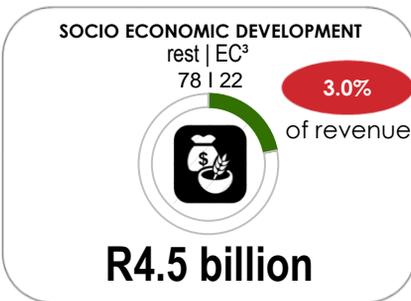
committed
SED in the
local
community

Approximately 22% of the total **socio-economic development (SED) contribution** leveraged by the IPPPP commitments in BW1 to BW4, 1S2 and 2S2 have been in the Eastern Cape province.

Development share

The IPP projects in the Eastern Cape that have been procured in BW1 to BW4, 1S2 and 2S2 have made a combined socio-economic development commitment¹ of R4.5 billion over the 20 year planned project operational life. This represents 22% of total SED commitments under the overall REIPPPP. Of this SED contribution, R3.9 billion has been committed to **local communities** located within the vicinity of the IPP projects in the Eastern Cape.

Committed (BW 1 to 2S2)²

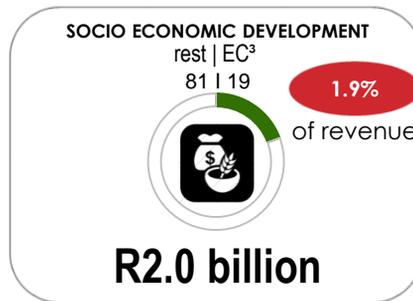


of which local:



R3.9 billion

Committed by active IPPs

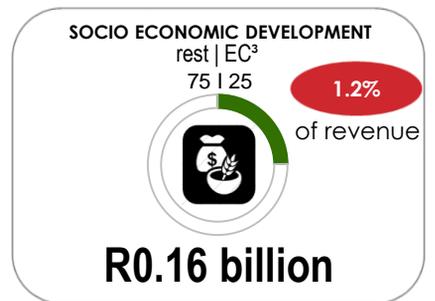


of which local:



R1.4 billion

Achieved / realised



of which local:



R0.14 billion

In the Eastern Cape, the expenditure on SED and ED initiatives to date under the IPPPP have been focused on five categories, namely; education and skills development, social welfare, healthcare, general administration, and enterprise development:



The prioritisation of education align well with the challenges faced by the Eastern Cape province. The targeted SED focus areas are therefore generally aligned with the provincial priorities, however alignment can further be improved and directed in subsequent bid rounds.

Note 1. SED commitments are made as a percentage of annual revenue. **Note 2.** Projects for BW3 and BW3.5 (one project each), BW4, 1S2 and 2S2 have not yet reached financial close. **Note 3.** Eastern Cape share (green bar/fill) vs. remainder of programme (other 8 provinces).

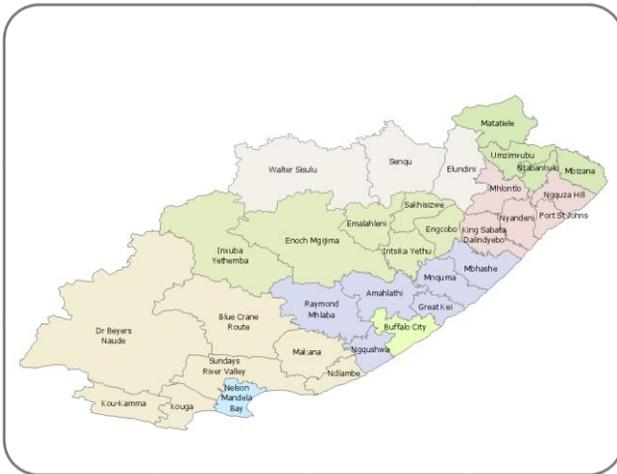


Socio economic
development

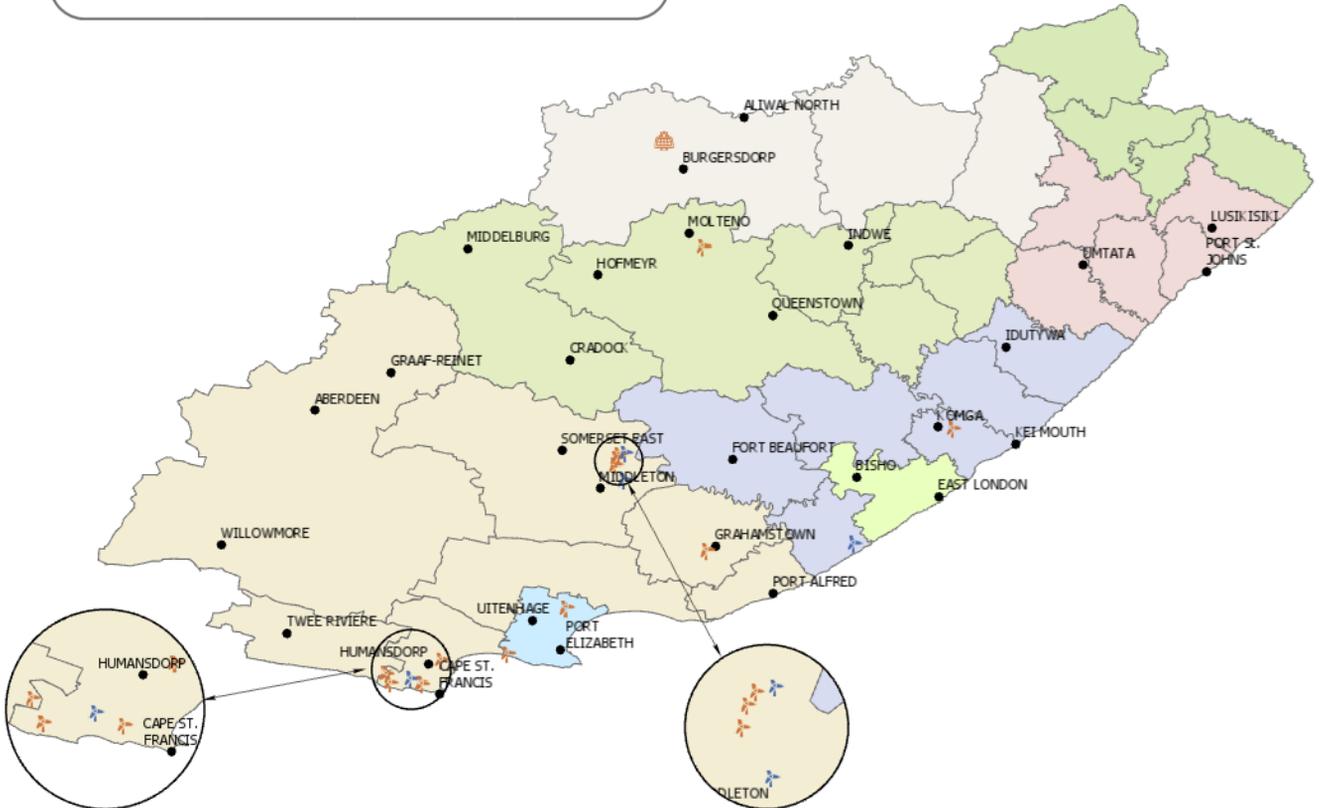


Local community

The impact on local municipalities



IPP Project status	OW	PV	CSP	SH	LG	BM
No financial close yet						
Under construction						
Operational						
Came online last quarter						
Expected to come online next quarter						
Completed – no Grid connection						



OW – Onshore wind; PV – Solar photovoltaic; CSP – Concentrated solar power; SH - Small hydro; LG – Landfill gas; BM - Biomass



District • **Amathole**
Local municipality • **Great Kei**

District • **Amathole**
Local municipality • **Ngqushwa**

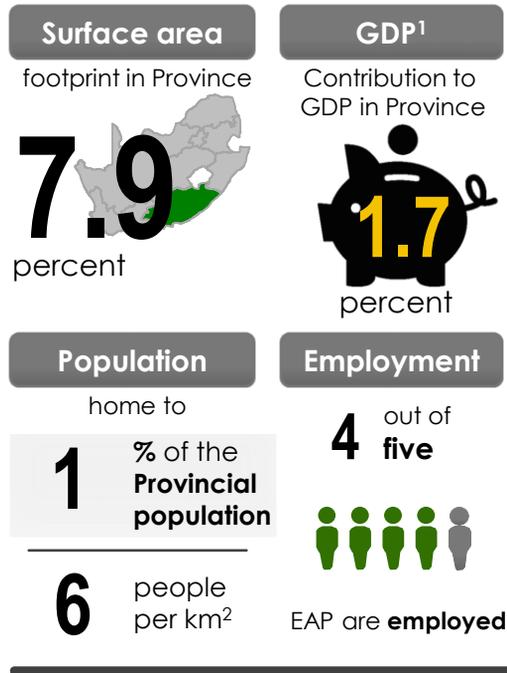
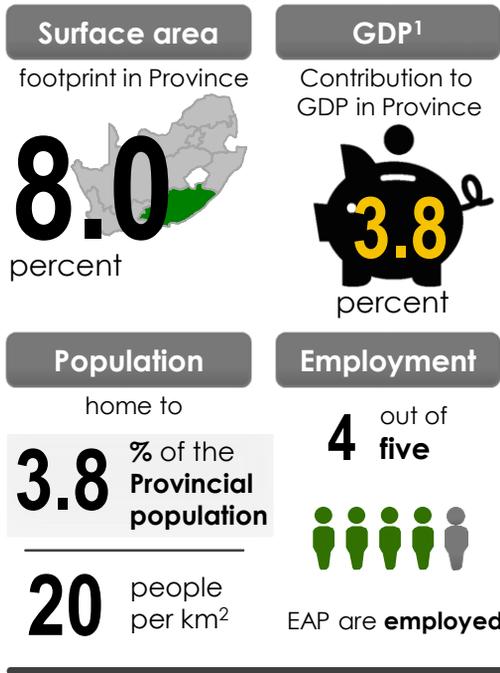


Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2016 Estimates. **Note 2.** IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years). **Note 3.** Reflects the cumulative, net positive, cash flows over the 20 year production phase.



District • **Chris Hanu**
Local municipality • **Enoch Mgijima**

District • **Joe Gqabi**
Local municipality • **Walter Sisulu**



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.** Reflects the cumulative, net positive, cash flows over the 20 year production phase.



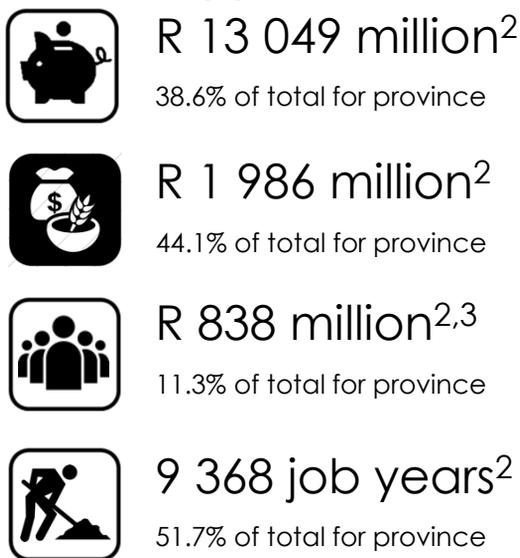
District • **Sarah Baartman**
Local municipality • **Blue Crane Route**



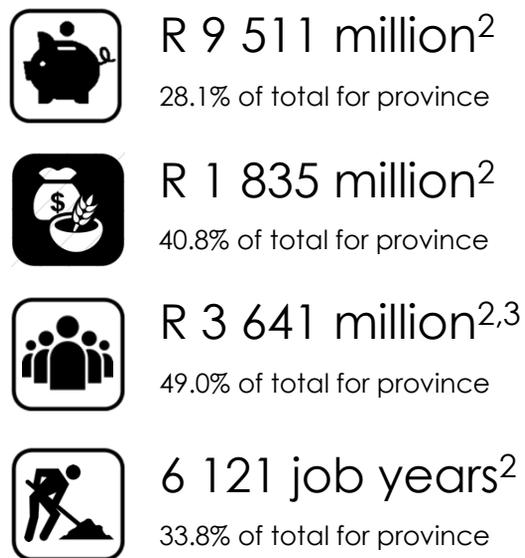
District • **Sarah Baartman**
Local municipality • **Kouga**



5 projects | 616 MW
of which



4 projects | 468 MW
of which

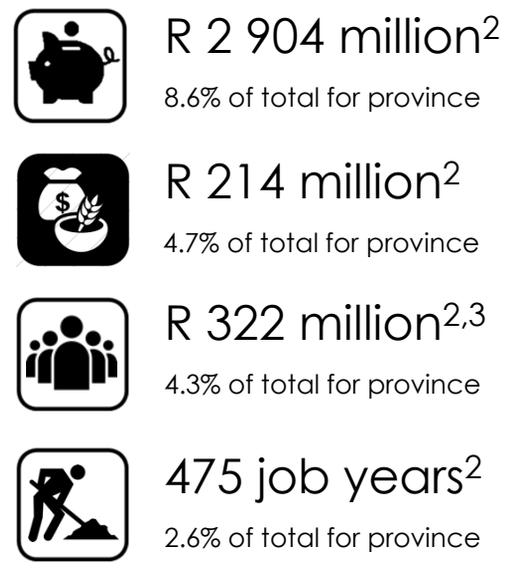


Note 1. All economic data = IHS Global Insight Regional eXplorer 744 (2.5q), 2016 Estimates. **Note 2.** IPP data reflects cumulative values over the construction phase and projected operational life (production phase) of the projects (i.e. 20 years). **Note 3.** Reflects the cumulative, net positive, cash flows over the 20 year production phase.



District • **Sarah Baartman**
Local municipality • **Kou-Kamma**

District • **Sarah Baartman**
Local municipality • **Makana**



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.** Reflects the cumulative, net positive, cash flows over the 20 year production phase.



District • Nelson Mandela Bay
Local municipality • Nelson Mandela Bay



Surface area

footprint in Province



GDP¹

Contribution to GDP in Province



Population

home to



Employment

4 out of five



646 people per km²

EAP are **employed**

2 projects | 87 MW 
of which



R 1 878 million²
5.6% of total for province



R 75 million²
1.7% of total for province



R 866 million^{2,3}
11.7% of total for province



610 job years²
3.4% of total for province

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.** Reflects the cumulative, net positive, cash flows over the 20 year production phase.

Appendix A

Reference component

Notes and observations

N1. Wind and solar resource maps indicating the natural resources for the Province.

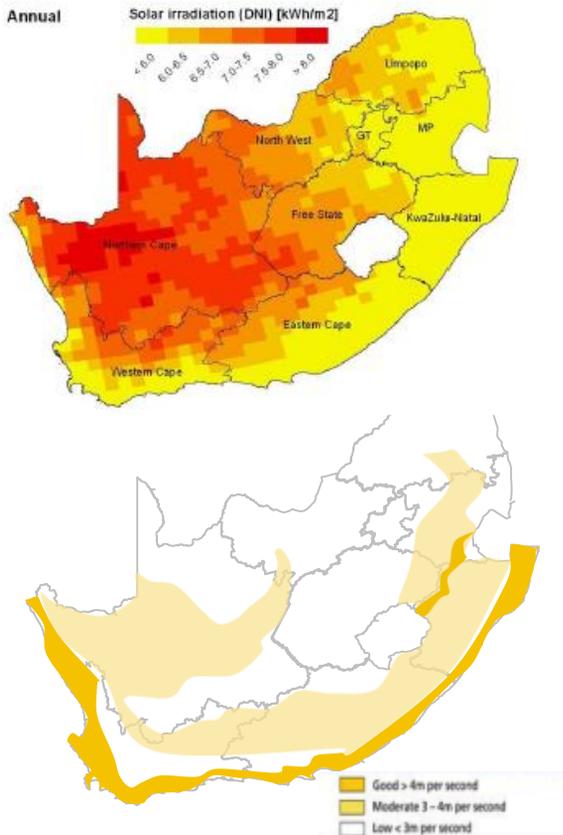


Fig. 1: National resource maps, SIP 8 Business plan



Fig. 3: EC Provincial regional development corridors

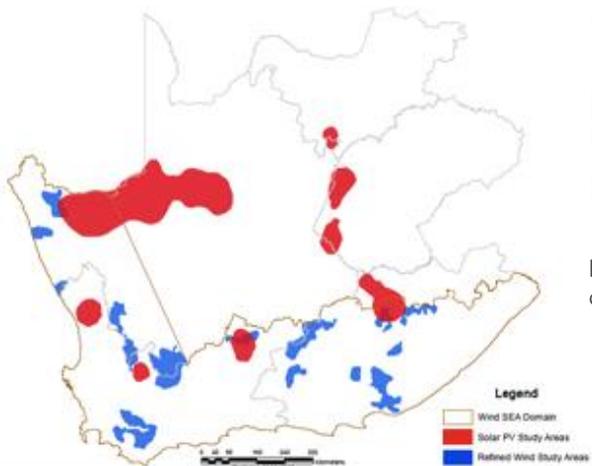


Fig. 2: CSIR high yield zones (http://www.safiri.co.za/ec/corridor_planning_&_development.html)

Notes and observations (cont.)

N2. National targets for renewable energy have been set in the National Development Plan (NDP) as:

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

The Green Energy Strategic Infrastructure Project (SIP), that operationalises the NDP, sets the target to deliver 6 725 MW RE through IPPs by 31 March 2019.

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

- The Ministerial determinations represent approximately 83% of the 2030 target of 17 800 MW.
- The combined capacity procured in BW1 to 4, 1S2 and 2S2 (i.e. 6 422 MW) represents approximately 92% of the 2020 target (i.e. 7 000 MW or 5 000 MW in 2019 plus 2 000 MW in 2020) for renewable energy deals.
- The combined capacity of BW1, BW2, BW3 and BW3.5 (already commissioned or in construction phase) represents approximately 80% towards the 2019 target for capacity commissioned.

N3. Spend patterns will vary notably between the construction and production

phases. Project construction expenditure will 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. 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. The spend pattern for the construction phase is illustrated (Fig 2) using indicative data.

N4. Employment over time. As for N3 (spend), the labour needs will be more intense (i.e. more people for shorter durations of time) during construction phase, tapering off as the construction of the plant is completed.

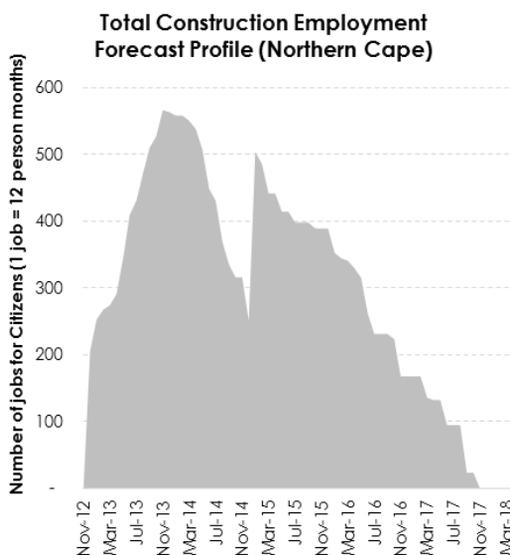


Fig 2. Construction employment forecast (example from Northern Cape Province)

Labour requirements during the production phase will be limited, however is likely to offer more sustainable employment opportunities over the 20 years of operation.

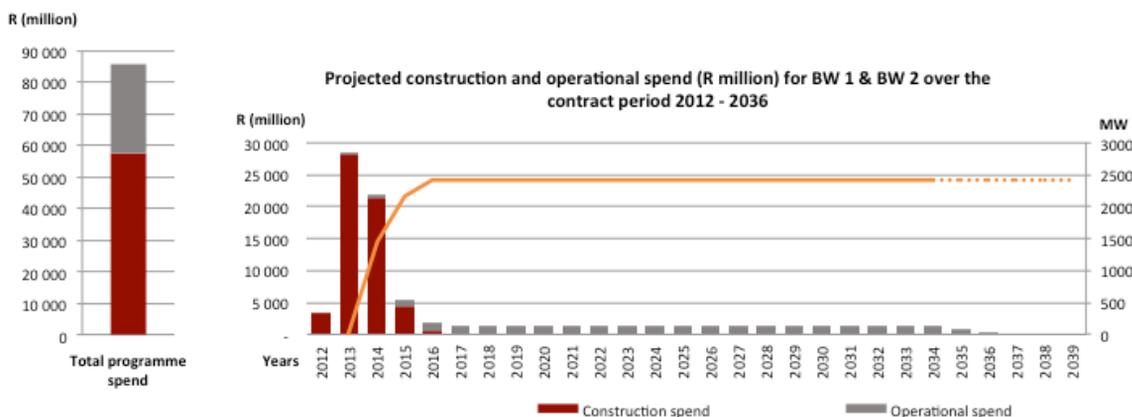


Fig 1. Operational and construction spend patterns

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 Generally Accepted Accounting Practice (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,

during the Term. 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 May and ending at 24:00 hours on 30 June 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 30 June 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 Department and the Lenders (or their agent) in relation to the PPA and the Implementation Agreement.
- **“Employment numbers”** are expressed as a percentage of the sum of StatsSA reported employed and unemployed numbers.

- **“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 Department.
- **“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).
- **“Local Content”** means the portion of the Total Project Value that is in respect of South African Products.
- **“NERSA”** – refers to the National Energy Regulator of South Africa, established pursuant to Section 3 of the National Energy Regulator Act, 40 of 2004.
- **“Operating Expenditure”** means any expenditure treated as operating expenditure under GAAP.
- **“Operating Period”** means the period from the later of the Commercial Operation Date and the Scheduled COD to the Termination Date Construction Period.
- **“Overnight Cost”** refers to the cost of a construction project if no interest was incurred during construction, as if the project was completed “overnight” (see also Total Project Cost, definition B).
- **“PPA”** means the power purchase agreement to be entered into between a Project Company, as the Seller, and the Buyer pursuant to the IPP Procurement Programme.
- **“P50 / P90”** – refers to probabilities for annual energy production which are expressed as P values. A P50 figure is the level of generation that is forecasted to be exceeded in 50% of years over a 10 year (or sometimes 20 year) period. Similarly, a P90 figure is the level of generation that is forecasted to be exceeded in 90% of years over a 10 year period – in other words, the risk that an annual energy production of P90 is not reached is 10%.
- **“Total Amount of Procurement Spend”** means the monetary spend on the procurement of goods and services for purposes of undertaking the Project Activities (without double counting), excluding costs of imported goods and services, taxation, salaries and wages.
- **“Total Project Cost”** means:
 - (a) for the purposes of calculating the Development Fee, an amount equal to the aggregate of the total Debt and Equity which is, as at the Signature Date, forecast in the Financial Model to be contributed up to the Commercial Operation Date; and
 - (b) for all other purposes, the total Capital Expenditure, forecast as at the Signature Date, to be incurred up to the Commercial Operation Date by the Seller in the design, construction, development, installation and/or commissioning of the Project.
- **“Total Project Value”** means during the Construction Measurement Period, the capital costs and costs of services procured for the construction of the Facility, excluding Finance Charges, land costs, mobilisation fees to the Operations Contractor and the costs payable to the Distributor, Network Transmission Costs (NTC) and/or a Contractor for the Distribution Connection Works or the Transmission Connection Works (as the case may be).

Glossary of icons

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



Gross Domestic Product (percentage indicating the contribution share)

percent

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



Agriculture



Mining



Manufacturing



Electricity



Construction



Trade (wholesale and retail)



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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energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA



national treasury

Department:
National Treasury
REPUBLIC OF SOUTH AFRICA

