



Utility-scale renewable energy

—

2017

Market Intelligence Report

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GreenCape



GreenCape

GreenCape is a non-profit organisation that drives the widespread adoption of economically viable green economy solutions from the Western Cape. Our vision is for South Africa to be the green economic hub of Africa.

We work with businesses, investors, academia and government to help unlock the investment and employment potential of green technologies and services, and to support a transition to a resilient green economy.

Acknowledgements

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Image courtesy of: Acciona Energy (South Africa)
Caption: Gouda wind farm embodies the transformation of South Africa's electricity sector. Gouda is the country's first concrete tower wind farm, with concrete units manufactured locally and assembled on site, achieving stipulated local content requirements.



18 Roeland Street, Cape Town, 8001, South Africa

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| Editorial and review: | Salomé Bronkhorst, Bruce Raw, Mike Mulcahy |
| Images: | GreenCape |
| Layout and design: | Deep Agency |

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List of acronyms and abbreviations

| | |
|-----------------|---|
| AUW | African Utility Week |
| CCA | customers controlled area |
| COD | commercial operation date |
| CPUT | Cape Peninsular University of Technology |
| CSIR | Council for Scientific and Industrial Research |
| CSP | concentrated solar power |
| DBSA | Development Bank of Southern Africa |
| DEA | department of environmental affairs |
| DoE | department of energy |
| dti | department of trade and industry |
| ED | enterprise development |
| EKF | Denmark Export Credit Agency |
| EPC | Engineering procurement and construction |
| ETI | employment tax incentive |
| GW _p | Gigawatt peak |
| IRP | integrated resource plan |
| IDC | Industrial Development Corporation |
| IFC | International Finance Corporation |
| ICN | International Cleantech Network |
| IEP | Integrated Energy Plan |
| IPP | independent power producer |
| kWh | kilowatt-hour |
| LNG | Liquefied natural gas |
| MW _p | Megawatt peak |
| NDP | National Development Plan |
| OEM | original equipment manufacturer |
| O&M | operation and maintenance |
| PPA | power purchase agreement |
| PV | photovoltaic |
| RE | renewable energy |
| REIPPPP | Renewable Energy Independent Power Producer Procurement Programme |
| RECP | Renewable Energy Cooperation Programme |
| RMB | Rand Merchant Bank |
| SAPVIA | South African Photovoltaic Industry Association |
| SARETEC | South African Renewable Energy Technology Centre |
| SAWEA | South African Wind Energy Association |
| SED | socio-economic development |

Executive summary

The global rise in the uptake of renewable energy (RE) continues, with a mix of firsts and biggest taking place in 2016. These range from record-breaking solar PV plant sizes to the longest manufactured wind blade yet.

South Africa's green economy, partly driven by the country's utility-scale Renewable Energy Independent Power Production Procurement Programme (REIPPPP), reflects these trends and is leading the way in some areas. According to Moody's, South Africa had the fastest growing green economy in the world in 2015.

The REIPPPP, a key factor in this growth, is in its sixth year and has achieved remarkable successes. To date, the programme has:

- **Procured over 6 300 MW_p of RE generation capacity**, of which over 2 500 MW_p has been connected and is feeding electricity into the national grid¹.
- **Selected 102 preferred bidders to develop utility-scale projects across the country** – with projects in every province across South Africa.
- **Received a ministerial determination to procure a further 6 300 MW_p of generation capacity**. This is the second time capacity to the programme has been doubled – a testimony to its success.
- **Attracted over R195 billion of investment into South Africa**, with over 25% from foreign investors². In doing so, the programme, through local content requirements, has successfully stimulated the development of a local RE technology components manufacturing sector. Given the additional 6 300 MW_p still to be procured, this sector is set to grow further.
- **Achieved significant technology price reductions**, with South Africa boasting some of the world's lowest clean energy costs³.

Beyond these successes, the programme and, consequently, the utility-scale RE industry, is well positioned to continue contributing to South Africa's national development as enshrined in the government's strategic infrastructure projects (SIP) and the National Development Plan (NDP).

The programme's socio-economic development (SED) and enterprise development (ED) mechanisms give successful project developers a unique opportunity to be competitive in their bidding strategy, while contributing meaningfully to the local and national economy.

- Project developers have fully embraced the SED/ED component of the REIPPPP, resulting in numerous inspiring contributions to priority areas on the government's developmental agenda.
- Among other areas, these contributions span community development, local economic development, skills development and early childhood development.

The recent uncertainties involving the state-owned utility, Eskom, highlight the need for reforms in an evolving energy sector, where electricity generation, transmission and distribution systems require unbundling. The interest from local municipalities in procuring RE generation capacity from independent power producers (IPPs) contributes further to the shift in the structure of the country's power sector.

Evidently, the South African government is committed to ensuring that the country's model for public-private power procurement, widely rated as world-class, continues. For instance, during the impasse with Eskom, the Presidency, the Deputy President, the Minister of Energy and the Finance Minister all expressed explicit support for RE procurement. This was finally resolved when the President made a directive during the 2017 State of the Nation Address for Eskom to sign outstanding PPAs. A week later, Eskom stated that those agreements would be signed.

Government policy also continues to strongly favour and support the inclusion of RE resources, as demonstrated by the release, in 2016, of the Integrated Resource Plan (IRP) update⁴. Though not finalised, the updated IRP provides continued policy certainty, while the 6 300 MW_p that has been allocated for further RE procurement provides an accurate estimate of the potential market size.

Without doubt, the changes brought about by the finalisation of the IRP and the resolution of outstanding issues involving Eskom will create numerous opportunities for investors and businesses in the utility- and embedded generation-scale RE sector.

— **The updated Integrated Resource Plan provides a good estimate of the market size, with a further 6 300MW_p allocated for RE procurement.**

— **The interest by municipalities to procure energy from independent power producers signals a further change to the energy sector.**

¹ As of June 2016

² The REIPPPP has, in total over its four bid windows, attracted more than double the total foreign direct investment (FDI) that flowed into South Africa in 2015

³ Based on the tariffs offered by projects in the latest rounds of the REIPPPP

⁴ This document, at the time of writing, was out for public comment



1 – Introduction and purpose

This report provides potential investors and businesses in the utility-scale RE space with a greater understanding of market opportunities in South Africa.

Globally, renewable energy (RE) has gained momentum, with a significant rise in the uptake of various RE technologies such as solar photovoltaics (PV), wind energy, biogas and other biofuels, hydroelectricity, landfill gas, geothermal energy, and concentrated solar power (CSP).

The key drivers of this global shift are also what are powering and providing a great deal of momentum to the evolution of South Africa's energy sector:

- government policy support and procurement programmes;
- sustainability and energy security concerns;
- cheaper renewable energy technologies; and
- conventional/ traditional electricity becoming more expensive.

Ministerial determinations by the South African government to procure RE — such as the Integrated Resource Plan (IRP) for Electricity 2010-2030, which lays out the country's electricity future — have given growth in the renewable energy sector a significant boost. At the time of writing the IRP was out for public comment, with likelihood of changes to the document given the various industry concerns around assumptions made in the modelling exercise. The IRP is discussed in more detail in later sections of this report.

In what follows, [Section 2](#) gives an overview of the market, describes market size and key players. [Section 3](#) details the general legislative and regulatory framework governing RE; while [Section 4](#) highlights opportunities and barriers in the market. [Section 5](#) focuses on funding and incentives, followed by an overview of the Western Cape as Africa's growing greentech hub in [Section 6](#). [Section 7](#) focuses on the free services provided by GreenCape to its members, including businesses and investors in the green economy.

Note: GreenCape's Energy Services Market Intelligence Report explores the energy services market, including the embedded generation RE market and energy efficiency.

For queries or to access our services, contact our Renewable Energy Sector Desk at re@greencape.co.za

2 – Sector overview

Accounting for nearly 5% of installed capacity, the South African renewable energy sector is showing rapid growth and significant potential. Every month new projects reach commercial operation, with over 2 GW_p of projects connected and operational to date.

2.1. Context

South Africa's generation capacity is dominated by coal-fired generation stations with a net output of 35.6 GW_p, which represents over 85% of the country's total installed capacity of over 44 GW_p. Nuclear generation capacity comprises 5% of generation capacity, and comes from the only nuclear generation facility on the African continent, Koeberg power station. As noted, RE accounts for 5% of generation capacity after very rapid growth since 2011.

This growth is the result of several factors:

- Proactive government leadership in procuring RE capacity;
- Increases in electricity tariffs charged by the national utility, Eskom;
- Global decreases in RE technology prices;
- Economic shifts towards sustainability practices.

Figure 1 (Eskom 2016) demonstrates how tariffs offered by utility-scale solar photovoltaic (PV) and wind energy in South Africa are becoming increasingly competitive with average tariffs from Eskom, with both falling below the R1/kWh mark. On the other hand, the average Eskom tariff is fast approaching this mark. Decreases in tariffs from RE technologies are a result of increases in global RE generation capacity and South Africa's own successes through the Department of Energy (DoE)'s Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

CSIR models show that solar PV and wind energy now provide the cheapest new sources of generation capacity. When coupled with flexible gas-powered generation, renewables provide the cheapest baseload capacity.

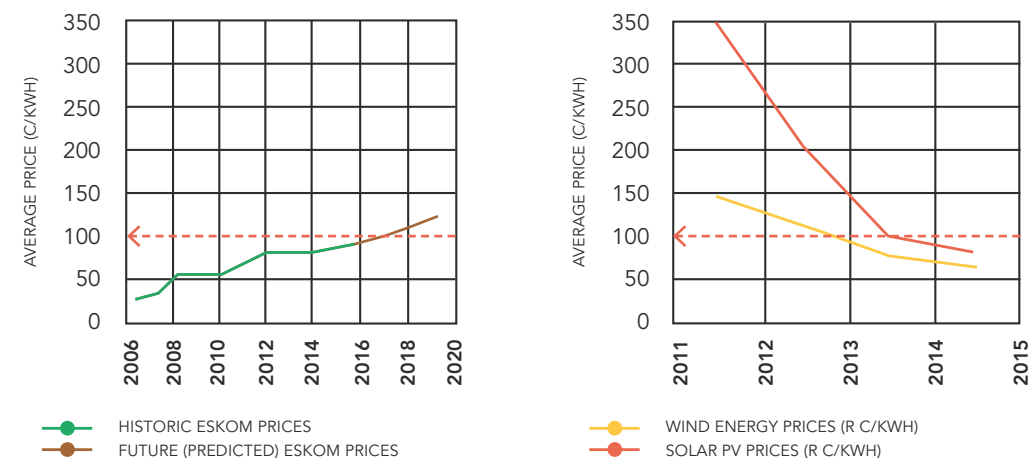


Figure 1: Average Eskom tariffs versus utility-scale renewable energy tariffs⁵

2.2. The REIPPPP

The South African utility-scale RE market is made up wholly of the DoE's REIPPPP. This is coordinated by the Independent Power Producer (IPP) Office, which was established by the DoE under its mandate to ensure secure and sustainable energy provision for sustainable development.

The REIPPPP is a competitive bidding process used by national government to procure RE generation capacity in line with the national Integrated Resource Plan (IRP) for Electricity 2010-2030. The IPP Office's procurement programme, under which new generation capacity is secured, is shown in Figure 2. For more on the IRP 2010-2030, see Section 3.



Figure 2: IPP Office procurement process

⁵ Note that the tariffs presented are in 2016 terms

The IPP Office has also launched a small IPP programme (IPP Office 2016c), which procures generation capacity from projects of less than 5 MW_p. The first round of selected small IPP bidders was announced in October 2015 and are approaching financial close. A second round of bids was submitted in June 2016 and successful projects were announced in January 2017 – a sure sign of the programme's continuity.

2.3. Key players

Market opportunities in the REIPPPP are best categorised according to the project development phases that the programme follows: development, construction, operations and maintenance. Accordingly, the key players or company types involved in this market are described in Figure 3, with an indication of which stage of project development they are typically involved in.

IPP

Independent power producer. It is responsible for project inception and development, land acquisition, finance sourcing and bid submission. May sometimes be a project sponsor or may submit bid with the backing of such an entity.

OEM

Original equipment manufacturer (OEM). It supplies the main piece of technology, e.g. the manufacturer of the selected turbine in a wind farm. This company will play a large role in dictating the technology partners that will constitute a project and may also play the role of O&M (see below).

O&M

Operation and maintenance (O&M) company. It is usually the main equipment supplier or a technical entity well-versed in the specific technology.

EPC

Engineering procurement and construction. Typically, this player is responsible for managing the various sub-contracts in the construction phase of a project and may also be involved in the design and development phase of the project.

Figure 3: Typical company types involved at different stages of project life

2.4. Market size

The REIPPPP has attracted close to R200 billion in investments into the South African economy – arguably one of the largest, if not the largest single investment stream into the country in recent years. At the start of the REIPPPP, a determination to procure just over 3.7 GW was passed. This was further increased, with a total of over 6.3 GW of generation capacity procured to date. Finally, the programme has effectively been doubled yet again, with the latest ministerial determination in Q4 2015 allocating a further 6.3 GW of generation capacity to be procured.

Figure 4 presents the cumulative RE generation capacity that has been determined for procurement by the Minister of Energy as of 2016, with the third and fourth determinations representing future procurement rounds, which have a total combined capacity of close to 8 GW_p. In line with these determinations, the total generation capacity that will be procured stands at over 14 GW_p.

At the time of writing, the IRP 2010-2030 had been released for public comment. While provision was still made for RE generation capacity, it was made under unjustified constraints, while the price assumptions used are significantly lower than those in the latest rounds of the REIPPPP. Given the long overdue revision of the document, its release for public comment has been a widely welcomed. With the plan reflecting a commitment to renewables, industry players feel that progress is being made.

The REIPPPP has attracted investment from prominent global RE project developers and Tier 1 component manufacturers. It has done so because of the size of the market, the programme's transparency and strong government support. Global leaders such as Abengoa, Mainstream Renewable Power and Juwi, as well as South African developers such as Pele Green Energy, Aurora Power Solutions and Boitherm Energy, have entered the market.

— **With 6.3 GW_p procured to date, and with a further ministerial determination for another 6.3 GW generation capacity, the REIPPPP has effectively been doubled again**

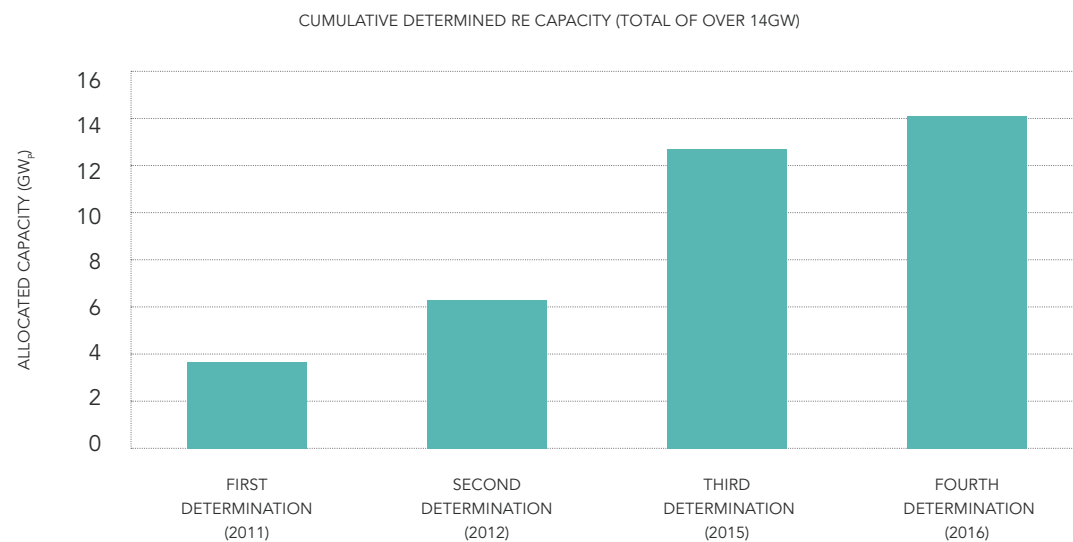


Figure 4: Cumulative capacity of RE determined for procurement

2.4.1. REIPPPP progress to date Allocations of generation capacity

Table 1 presents final capacities per round, including the small IPP programme. As the table shows, wind and solar PV are the dominant technologies in terms of actual capacity that was procured, with later rounds of the programme having to adjust their allocated technology as the result of favourable bid prices as well as high (over-) subscription rates.

A recent update from the IPP Office indicates that the programme has made progress as follows (IPP Office 2016a):

Bid window I

100% of projects reached COD⁶

Bid window II

100% of projects are grid-connected;
100% have reached COD

Bid window III

48% of projects are grid-connected;
19% have reached COD.

2.4.2. Economic value of renewable energy facilities

A Council for Scientific and Industrial Research (CSIR) study (CSIR 2015) demonstrates that between January and June 2015, REIPPPP projects, with some 800 MW_p and 1 GW_p of wind and solar PV respectively, 'generated up to R4 billion more in financial benefits than they cost'. As projects from more recent rounds of the programme come online, the installed capacity and financial benefits realised will continue to increase as these projects offer much lower tariffs (see Table 2).

Table 1: Actual procured generation capacities per REIPPPP bid window

| Technology | Actual capacity procured per round (MW) | | | | | |
|---|---|-------------|-------------|-------------|--------------|-----------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 4B | Small IPP |
| Wind | 648 | 558 | 787 | 676 | 687 | 10 |
| Solar PV | 626 | 417 | 435 | 415 | 398 | 30 |
| Concentrated solar power | 150 | 50 | 400 | 0 | 0 | 0 |
| Landfill gas | 0 | 0 | 18 | 0 | 0 | 0 |
| Small hydro | 0 | 14 | 0 | 5 | 0 | 0 |
| Biomass | 0 | 0 | 16 | 25 | 0 | 10 |
| Biogas | 0 | 0 | 0 | 0 | 0 | 0 |
| Total (MW) | 1425 | 1040 | 1656 | 1121 | 1085 | 50 |
| Total generation capacity procured (MWp) | | | | | 6 378 | |

Table 2: Tariffs offered by solar PV, wind and CSP projects over bid windows⁷

| Technology | Average bid prices (R c/kWh) | | | | |
|---|------------------------------|---------|---------|---------|----------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 4B |
| Wind(R c/kWh) | 145 | 112 | 77 | 65 | 75 |
| Total reduction from round 1 (%) | -49% | | | | |
| Solar PV (R c/kWh) | 352 | 206 | 104 | 82 | 89 |
| Total reduction from round 1 (%) | -75% | | | | |
| Concentrated solar power (R c/kWh) | 343 | 314 | 173 | n/a | |
| Overall price reduction from Round 1 | -50% | | | | n/a |

⁶ COD – commercial operation date; referring to the day on which the projects' Power Purchase Agreements with Eskom commence and payments begin for generated power

⁷ Note that prices are indexed to 2016 terms – adjusted by inflation as per (Inflation.eu, 2016)

Investments made to date

Total investments made into the programme (debt and equity) over the past four bidding windows, excluding the additional round four and accelerated bids, totalled over R194 billion in project value as of June 2016 (IPP Office 2016b). This is split between domestic (73%, R141 billion) and foreign (27%, R53 billion) investments. The programme has been successful not only in attracting significant investments but also in attracting a wide variety of investment sources (see Figure 5.)

The REIPPPP has attracted investments of R194 billion – R141 billion domestic and R53 billion foreign investments.

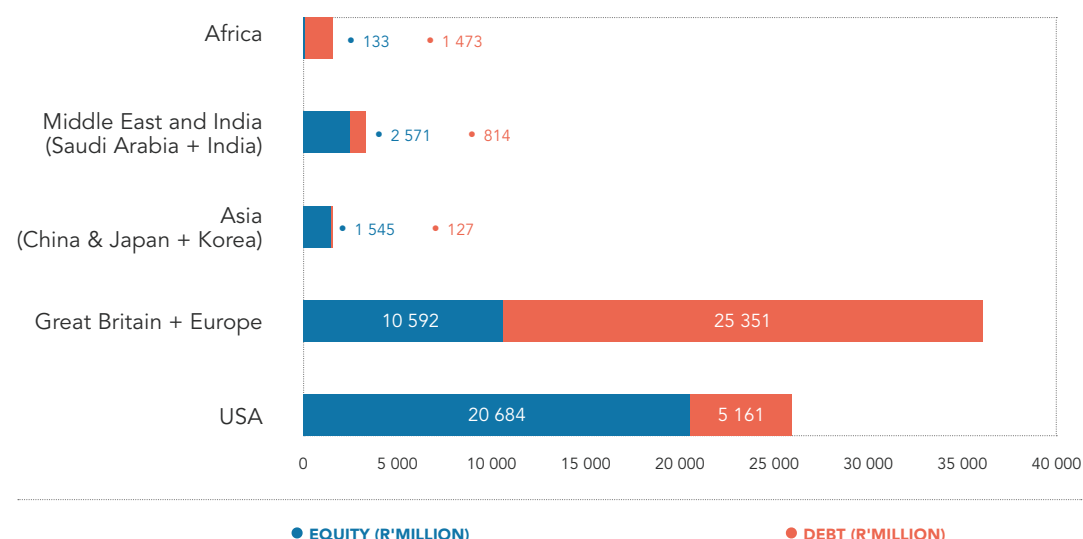


Figure 5: Countries from where private investments were made in the REIPPPP

2.5. Beyond kWhs towards development

Energy security and investment attraction aside, the REIPPPP contributes directly to South Africa's broader national development agenda. This is both by design – to be credited to the multi-ministerial collaboration between the National Treasury, the DoE, the department of trade and industry dti, (see Section 3.2 for more on related government departments); and through the willingness of industry players who recognise the South African socio-economic context they are developing projects in and are making meaningful contributions.

South Africa's socio-economic development agenda is outlined in the government's special infrastructure projects (SIPs) and in the objectives of the National Development Plan (NDP) (see below).

2.5.1. Government's strategic infrastructure projects

Through its economic development selection criteria, the REIPPPP is well aligned with the government's SIPs. Therefore, it is a strategic programme in achieving the country's development agenda. The ultimate goal of the SIPs is to address issues of poverty, unemployment and inequality, through 18 focus areas (Government of South Africa 2016), as follows:



Figure 6: Groupings of the Strategic Infrastructure Projects (SIPs)

Specifically related to the REIPPPP's outputs are the three energy SIPs (SIP 8, SIP 9 and SIP 10), as well as, to some extent, the regional SIP, SIP 18, which focuses on regional integration for African cooperation and development. In terms of the energy SIPs, the REIPPPP fulfils the goal of providing clean and sustainable electricity combined with specifically mandated obligations to deliver socio-economic

development benefits to local communities. Fortuitously, these communities live primarily in rural areas of South Africa.

The programme also has an indirect link to SIP 15 (expanding access to communication technology). Although there is no specific mandate for projects to deliver communications technology infrastructure, there is an opportunity to deliver this infrastructure through the more than R19 billion that has been committed to socio-economic development (SED) and enterprise development (ED) spending by selected projects to date⁸. Finally, in line with SIP 18, the skills developed and experience gained by South Africans and South African-based companies can be exported to neighbouring regions where the RE sector is on the rise.

The REIPPPP programme contributes to 10 of the 14 national outcomes outlined in the National Development Plan.

According to the IPP Office (IPP Office 2016b), the REIPPPP contributes directly and indirectly to ten of the country's 14 national outcomes outlined in the NDP, particularly to Outcome 6 – an efficient, competitive and responsive economic infrastructure network. The REIPPPP is directly applicable to two of Outcome 6's sub-outcomes, as follows:

- Adequate electricity generation capacity commissioned – with a target of 10 GW to be added by 2019
- Electricity generation reserve margin increased – with a target to increase this to 19% by 2019 (from 1% in 2010).

All these points combine to demonstrate the strategic significance of the REIPPPP in contributing to a national developmental agenda.

⁸ These figures refer to projects from rounds 1 to 4 and 4B, over the 20-year PPAs of the projects.



© Image courtesy of Acciona Energy
 Image: A 100% local logistics company transporting a single wind blade to site.
 A 138 MW wind farm may require upwards of 138 single wind blades.

2.5.2. Economic development through the REIPPPP

The REIPPPP's economic development component accounts for an essential part of its developmental contribution by ensuring the achievement of objectives such as:

- **Job creation:** focused on South African citizens, black South African citizens and those local to projects;
- **Local content:** capturing as much of the local project spend as possible;
- **Ownership:** advancing ownership by black South Africans and local communities;
- **Management control:** increasing the presence of black South Africans in management of the economy;
- **Preferential procurement:** empowering small, and black-, women- and youth-owned enterprises;
- **Enterprise development:** developing small businesses in local communities and stimulating the local economy;
- **Socio-economic development:** addressing some of the socio-economic needs of communities local to projects.

To date, based on selected projects from bid window one to four (including 4B), communities (as part-owners of projects) will earn a net income in excess of R29 billion over the 20 year lifespan of the power purchase agreements. There are numerous inspirational examples of local economic development happening as a direct result of the REIPPPP. These success stories are widely communicated by the various industry associations concerned, including the South African Photovoltaic Industry Association (SAPVIA) and the South African Wind Energy Association (SAWEA). Among many others, highlights include over 24 000 job years created in construction and O&M phases of numerous plants to large investments in manufacturing capacity and equipment.

To truly demonstrate the impact and future benefits of the programme, it is necessary to look at programmes on the ground. One such example is the South African Renewable Energy Technology Centre (SARETEC) (SARETEC 2016) on the Cape Peninsular University of Technology

(CPUT) campus in Bellville, Cape Town. As well as short courses on solar PV systems and biomass technologies, SARETEC now offers internationally accredited courses for:

- Wind turbine services technicians
- Solar photovoltaic service technicians.

The institution was specifically founded to cater for the REIPPPP's skills requirements, particularly in the long-term operation and maintenance phases of projects.

Case study: Kathu Solar PV Facility

In the Northern Cape, during the construction of a 74 MWp solar PV facility, 300 jobs were created, 60% of them filled by local community members; 120 South African companies benefitted from various contracts and supply agreements; and over R657 million was spent with qualifying small enterprises. Of this, R20 million was spent with women-owned enterprises.

— **The South African Renewable Energy Technology Centre, or SARETEC, was founded to develop local skills for the operation and maintenance of REIPPPP projects over their 20 year PPAs.**

3 – Policies and regulation

This section focuses on policies and regulation that guide and affect procurement in the renewable energy sector.

3.1. Guiding policies

South Africa's economic growth is guided by several key policies, as shown in Figure 7 (Department of Economic Development 2011). Of these, the policies highlighted relate directly to procurement within the RE sector via the economic development component of the REIPPPP. The design of the REIPPPP takes into account all these policies, making it a highly strategic infrastructure and development programme.

National Development Plan (NDP)

Supports procurement of at least 20 GW of RE by 2030 in its outline of the country's development path.

New Growth Path

Sets targets creating jobs and identifies priority areas, with infrastructure development named as key to the success of this vision.

Green Economy Accord

Incorporated within the New Growth Path, this accord between government, labour and business seeks to shift the country's economy towards sustainable development, green job creation and industrial development.

Local Procurement Accord

As the economy grows and the country industrialises, this accord sets an aspirational target of 75% of all products used in the country to be manufactured locally. This is particularly evident in the REIPPPP's local content rules.

IEP

Outlines the general energy plan for the country. The IEP looks into energy security, access to energy, reducing cost of energy supply, energy efficiency, localisation and sustainability in all energy matters.

IRP

Specifically outlines the planning, sourcing and quantities of electricity generation sources contributing to the country's generation mix.

RE White Paper

Determines that a significant and equitable level of national resources should be invested in RE, while also setting targets for RE generation capacity.

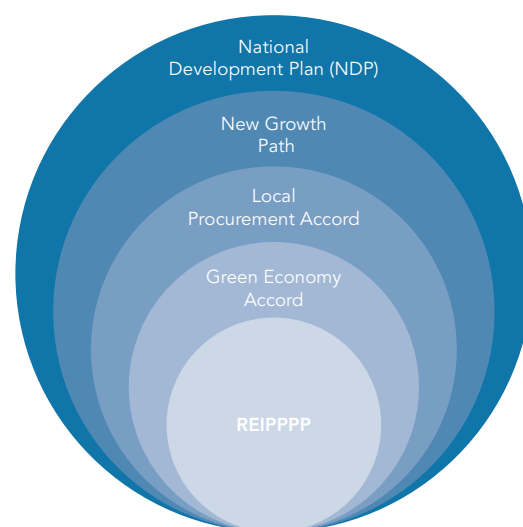


Figure 7: Policies guiding South Africa's economic growth trajectory

3.2. Government departments involved in the energy and electricity sector

Different government departments are involved in various capacities in executing the policies listed in Section 3.1. The most prominent departments are listed below, with a brief summary of their interaction with the REIPPPP:

National Treasury

Ensuring value for money, affordability of electricity supply and providing sovereign guarantees for the signed PPAs.

Department of Environmental Affairs (DEA)

Ensuring environmental custodianship and assessment of environmental impact studies as well as ensuring appropriate land use.

Department of Trade and Industry (dti)

Responsible for ensuring industrialisation through the REIPPPP's economic development component, especially local content; as well as black economic empowerment and development of small businesses.

Department of Public Enterprises

Shareholder in Eskom, the sole power off-taker.

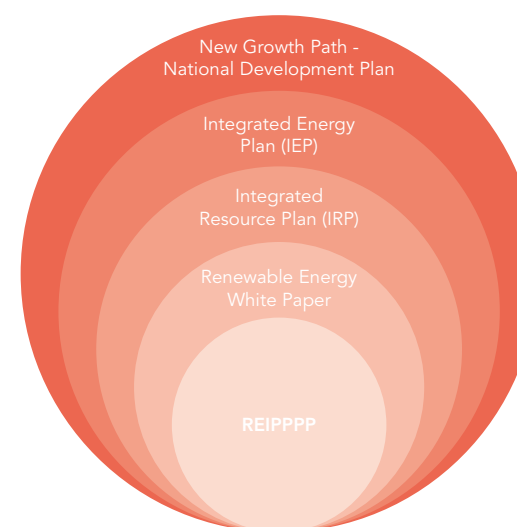


Figure 8: Eco-system of policies relating to the REIPPPP

4 – Opportunities and barriers

Changes in the country's electricity sector continue to present a variety of opportunities for the RE market in future rounds of the REIPPPP, during which the government will procure a further 6.3 GW_p.

These changes and opportunities include:

- The potential for local government procurement of electricity from IPPs.
- Manufacturing opportunities from local content requirements;
- Opportunities for greentech manufacturers in the proposed Atlantis GreenTech SEZ.

This section discusses the opportunities presented by the REIPPPP and challenges to the RE sector's growth. To ensure the continued support and attractiveness of the programme, this section also details additional and continuing opportunities presented by the market, outlining the nature of the challenges and how they may be overcome by custodians within government and the private sector.

4.1. Growth forecast Future rounds of the REIPPPP

The guiding policy behind the REIPPPP programme remains the IRP. The 2010 version of this document sets a target to procure a total of 17.8 GW_p of RE generation capacity by 2030. At the time of writing, an updated IRP is out for public comment. Preliminary reading of the document has raised concerns from the RE industry.

These concerns will form part of a body of commentary communicated to the Department of Energy:

- The base case is constructed with constraints on the uptake of renewables – there is little reason to do this.
- The price assumptions around RE technologies are higher than the most recent prices from the REIPPPP, thereby reducing the role of renewables in the energy mix.

However, the ministerial determination made in Q4 2015, allocating a further 6.3 GW_p of capacity to this programme, still stands. This reinforces government's broad support for the continuity of the REIPPPP and a diversification of the country's energy mix through the deployment of renewables. This determination also went a long way towards ensuring the programme's longevity, allowing investors looking at the South African RE market to make decisions based on longer-term market availability. This additional allocation will be divided among the various technologies as shown in [Figure 9](#) (CDH 2015) (Government of South Africa 2015).

© Image courtesy of Acciona Energy

Image: Workers construct the foundation for a single wind tower, creating employment at all skills levels. The programme dictates that labour be sourced, preferentially, from local communities.

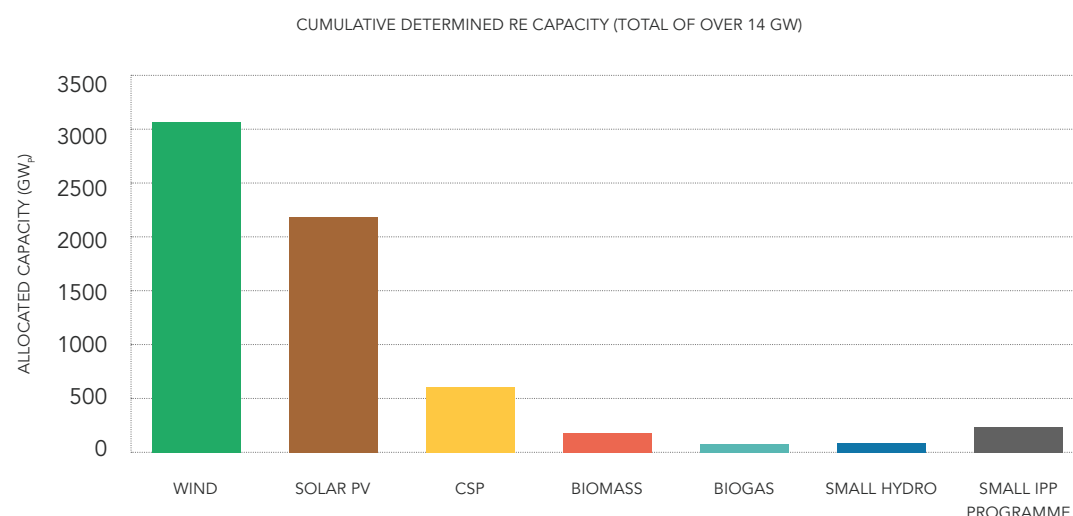


Figure 9: Breakdown of allocations of the latest ministerial determination for renewables

A closer look at the programme's yearly rollout — specifically solar PV and wind energy capacity, the dominant technologies — demonstrates significant market opportunity. This is presented in [Figure 10](#), which, using historic procurement, assumes an average procurement per year of 670 MW_p and 450 MW_p for wind and solar PV respectively.

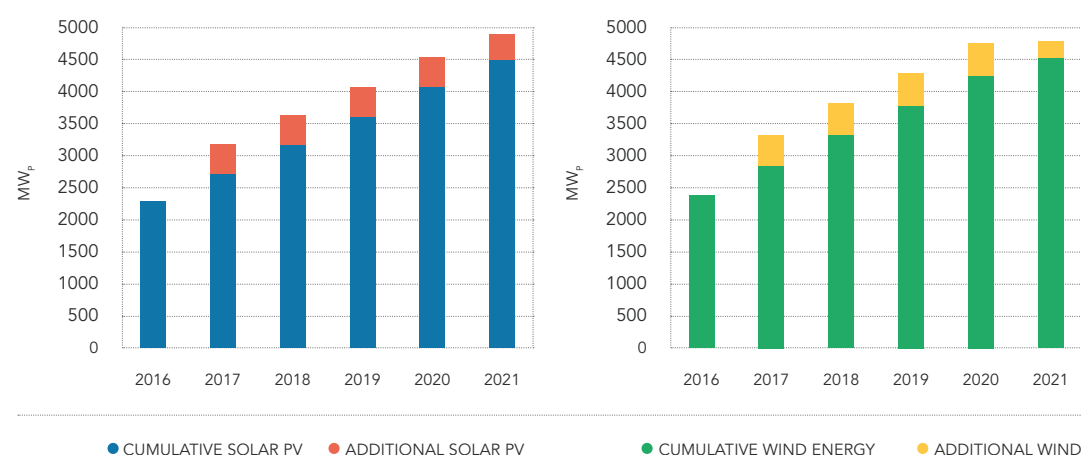


Figure 10: Predicted growth of procured wind energy and solar PV generation capacity

[Figure 10](#) highlights that no capacity was procured in 2016 as a result of factors discussed in more detail in [Section 4.4](#). However, the programme still presents significant opportunities. Considering the programme has procured about 6.3 GW_p to date, effectively doubling it could well attract similar figures with an additional R190 billion in investments. The caveat, however, is the existence of conducive conditions, primarily continuity and certainty of government support.

A 2016 CSIR study shows that the lowest measured wind energy resource point in South Africa is still higher than the average German resource point. The study also indicates that a 30% share of renewables in the country's generation mix would not cause significant short-term ramps (fluctuations in generation capacity) if the spread and allocation between wind energy and solar PV is balanced (CSIR 2016a). This work demonstrates the viability of a future energy mix that has significant and affordable levels of RE capacity, complemented by gas-powered generation capacity with its high dispatchability.

Opportunities in a diversified electricity future

As the costs of RE technology continue to decline, and as options around the role of liquefied natural gas (LNG) for mid-merit generation are explored further, another recent CSIR study (CSIR 2016b)⁹ demonstrates a significant shift in the structure of the country's generation mix. The scenario presented by the CSIR demonstrates a cheaper electricity future compared to the now outdated IRP 2010-2030¹⁰ forecast, based on significant revision of price assumptions for RE technologies and the country's excellent RE resources. As we have already seen, such a future holds considerable opportunities for localisation of technologies. This includes gas localisation opportunities, starting with the IPP Office's gas IPP procurement programme (IPP Office 2016d).

Finally, through successive rounds, the easy-to-connect dots on the national grid are diminishing. Therefore, future projects will be located where there is grid availability and not necessarily the best resources. The map of all REIPPPP¹¹ projects selected to date indicates that this trend is already underway. Such trends lend themselves to bidding strategies that optimise the economic development component of project development – including creative socio-economic development projects as well as localisation and local procurement efforts, an opportunity further detailed in [Section 4.3](#).

⁹ The study demonstrates the economic viability of a 70% RE penetration complemented by mid-merit gas-powered generation.

¹⁰ At the time of writing, an updated IRP was out for public comment.

¹¹ The Energy Blog: <http://energy.org.za/knowledge-tools/map-south-african-generation-projects>.



© Image courtesy of Jeff Barbee
Image: A concentrated solar power (CSP) plant in the Northern Cape province nears completion. The plant will supply dispatchable power with storage capacity.

4.2. Local government power procurement

As a result of rising electricity prices plus their efforts to reinforce their energy security and become more sustainable, municipalities — which rely heavily on revenue from the sale of electricity to subsidise other customer services to their customers — have begun exploring options to procure electricity from RE IPPs. This presents a significant market opportunity, potentially for utility-scale projects¹², as well as the embedded generation sector.

Until recently, the generation of electricity has been almost exclusively the mandate of national government, through Eskom. The biggest hurdles facing municipal power procurement are the current national regulations governing generation licensing and the need for a ministerial determination. A specific ministerial determination, like the one that enabled the various IPP programmes, is needed to allow municipalities to purchase directly from IPPs. Currently, there is no precedent for this. However, the City of Cape Town (CoCT) has made a request for such a determination and Ekurhuleni municipality released an RFP for IPP generation in the second half of 2016. The success of such a programme would ultimately rest on a ministerial determination being made.

Accordingly, the ongoing changes in legislation around generation licensing and own-use present opportunities for municipalities to increase their participation in the generation sector and, therefore, their energy autonomy.

Municipal procurement of electricity from independent power producers presents a significant market opportunity for utility-scale projects and the embedded generation sector.

4.3. Economic development presents strategic advantage for bidding

4.3.1 Local economic development

As the price points for successful bids bottom out, the strategic advantage for winning bids will shift to those with stronger, more creative economic development programmes, involving:

- local content,
- local procurement and
- community benefits.

There are therefore opportunities for:

- investors into local manufacturing of RE technology components
- local enterprises that supply into the RE value chain [please put footnote back in!]
- community initiatives in and around selected project locations.

Over successive bid windows, the local content levels required of successful projects have increased as shown in [Figure 11](#). This trend, combined with increasingly competitive tariffs and decreasing grid availability (see above), all contribute to the growing importance of creatively delivered economic development plans, such as local content socio-economic development, in selecting successful projects.

Over the completed bidding windows and selected projects, there is a projected local spend of around R66 billion, while actual local spend from projects that have started construction and operation is reported at over R32 billion. This spend is set to increase significantly once round four projects reach financial close and begin construction (IPP Office 2016b).

¹² Utility scale, in this instance, is arbitrarily set at projects above 5 MW_p.

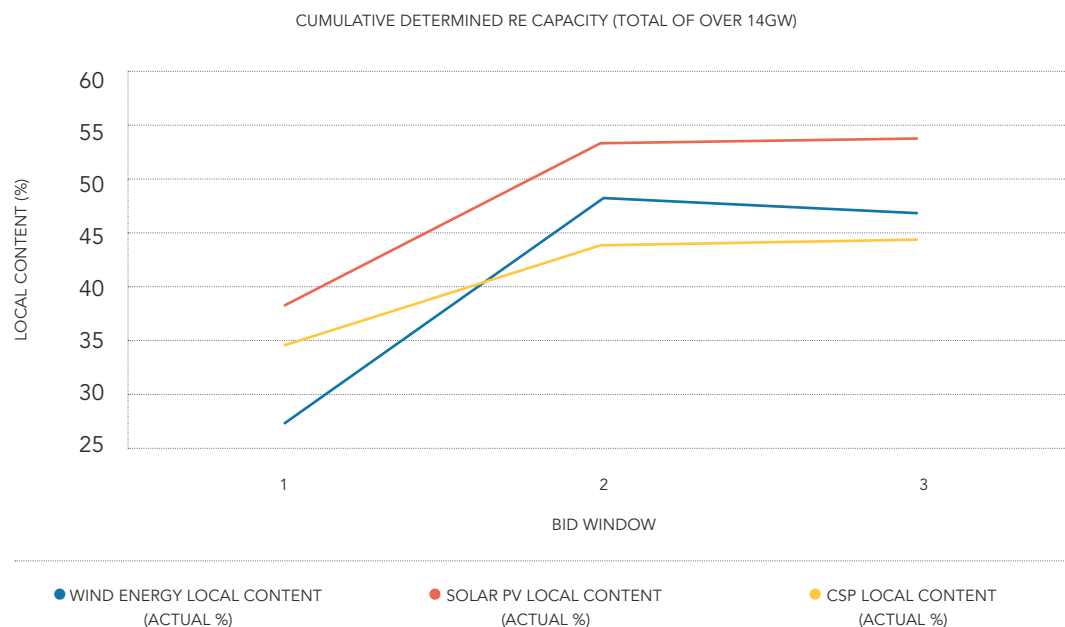


Figure 11: Increasing local content over successive bidding rounds

4.3.2. Manufacturing potential

Revised local content criteria

The dti has revised the methodology used to calculate local content to capture investments in component manufacturing:

- **Specific component manufacturing will be encouraged:** The criteria will focus on specific components of a facility (for example, in the case of a wind farm, towers and tower internals) that government seeks to encourage local manufacturing/assembly of.
- **Weighting will be applied:** These components will then weigh more towards local content, while the balance of plant components, such as civil and electrical works — which are mature industries in South Africa — will not count for local content, but must be procured locally.

This change in criteria gives a positive signal to investors about government's commitment to supporting local manufacturing investments while recognising shortcomings in the implementation of local content rules.

OEMs already in the market have the competitive advantage. Those who are supplying into the REIPPPP already are able to tap into the opportunity created by the dti recalculation. They can, however, sharpen their competitive advantage aligning closely with the country's industrialisation agenda (such as the local content stipulations) and the dti's Special Economic Zone (SEZ) programme, which in the Western Cape has translated into the proposed Atlantis GreenTech SEZ.

Localisation studies

Localisation studies have been commissioned by the dti for solar PV, wind energy and concentrated solar power (CSP) technologies. The purpose of these studies is to define which and how many components can be manufactured or assembled locally. The wind localisation study (DTI 2015), for example, indicates that the localisation of wind energy technology could result in the set-up of:

- between one and five wind tower manufacturing facilities¹³
- one blade manufacturing facility
- one facility to assemble nacelles and hubs.

The dti localisation study for solar PV has found that it is feasible to set up at least five solar PV component manufacturing facilities in the country. Noting the possibility of increasing the uptake of solar PV generation, as per the CSIR's study, there is an even larger manufacturing opportunity than may have previously been determined.

The Western Cape alone has, in the past three years, realised around R500 million in investments into component manufacturing. This total excludes spend on local services such as logistics, civil and electrical works for projects based within the province and nationally.

The REIPPPP stimulating investment in Special Economic Zones and Industrial Development Zones

In line with the REIPPPP's contribution to development and local content manufacturing, a number of special economic and industrial zones have attracted investments by component manufacturers and other investors.

- **Atlantis SEZ:** Investments worth R680 million have been attracted to the proposed Atlantis Greentech SEZ. It is projected that the SEZ will attract a further R1 billion worth of investment over next five years (IOL 2016). The bulk of this investment will come from the manufacturing of RE technology components.
- **Northern Cape,** which houses the majority of solar projects, is set to realise significant investments from local content.
- **The Eastern Cape's East London and Coega IDZs** also house significant manufacturing investments, in solar PV panels and wind towers respectively, directly aligned to the success of the government's REIPPPP.

¹³ Two such facilities have already been set up in South Africa, with one of them located in Atlantis Western Cape

4.4. Market uncertainties

Recent developments have to a large extent removed current uncertainties and the impasse in the RE market. President Zuma's directive to Eskom to sign outstanding power purchase agreements (PPAs), coupled with the President and other ministers' expressed commitment to the REIPPPP, has provided clarity on the government's strategic priorities on energy procurement. Together with the release of the IRP and the announcement of ten successful small IPP bid window 2 projects, these have been welcome developments for the sector.

There is still a critical need for action by government on three levels, namely:

- Ensuring continuity and continued transparency in the rollout of the REIPPPP.
- Maintaining the country's existing manufacturing base and attracting new investments.
- Prioritising the reform of the country's electricity sector to reflect South Africa's wealth of energy resources and the market's current offering.

Ensuring continuity and transparency in the REIPPPP rollout

The success of the REIPPPP has largely hinged on the market size and longevity that the programme has afforded investors, as well as on the lauded transparency in the programme's execution. Substantial efforts are needed to maintain these conditions, especially in light of recent programme challenges. Such efforts would include:

Finalising the IRP as a priority: It is imperative that the IRP is finalised in a transparent manner. The plan has been released for public comment to take into account public and industry inputs. An appropriate due diligence is necessary, especially relating to assumptions in the modelling of available resources.

Allocated projects should be rolled out immediately, as determined by the Minister of Energy. At the time of writing, round 4 and 4B projects have not yet reached financial close, pending signing of PPAs with Eskom. Expedited round projects have also not yet been announced.

Clear plans on REIPPPP's future rollout should be announced. This will enable investors (from project developers to manufacturers) to make informed investment decisions and take long-term views on the market.

Markets in other parts of the world are on the rise, which means the local market is facing greater competition for investments. Nevertheless, given the South African RE market's size, globally recognised effectiveness and transparency, the opportunity is still there for government to secure continued investment flows into the REIPPPP by carrying out its procurement plan.

Maintaining the country's existing manufacturing base

The REIPPPP has been highly successful in attracting manufacturing investments. However, because of global shifts and the Eskom impasse, investments have decreased in the past 12 months, especially in the manufacturing of RE technology components.

Local manufacturing is crucial to the success of the REIPPPP's economic development (local content) component. It contributes to the selection of successful projects and forms part of the programme's contribution to the national developmental agenda. To ensure that this manufacturing base is maintained, over and above the continuity of the programme, the following is needed:

Successful implementation of the government's Special Economic Zone programme

The SEZ programme is geared towards creating conducive environments for specific economic activities and supports national industrialisation efforts. The proposed Atlantis Greentech SEZ is well positioned to enable local manufacturing of RE technology components. It will form a strategic link in the ecosystem that government is creating to fully realise the opportunities that the REIPPPP presents.

Execution of local content and enterprise development components of the REIPPPP

The local content component of economic development has been written into bid submission rules and is well understood. What is now needed is due diligence from both government (specifically the IPP Office) and the private sector to ensure compliance. Monitoring and evaluation are critical to ensure the credibility of the programme. It will also ensure that IPPs make use of local manufacturing capacity that has been set up in the country in response to REIPPPP and other industrialisation efforts.

Ensuring the implementation of SEZs and compliance with local content requirements will strengthen the market. Coupled with the rollout of the additional 6.3 GW_p of capacity allocated to RE generation it will also provide the certainty and clarity that are so crucial for sustaining investor confidence.

Reforming the country's electricity sector

The recent tensions involving Eskom as the traditional grid operator point to a need to reform the country's electricity sector in two ways:

Eskom should be allowed to revise its business model

Global trends in electricity sector development show that it is typical for traditional monopolies to resist any sector reform or liberalisation that will reduce their market advantage.

This is not a new or unique situation. Introducing competition in the generation space is a healthy market development, which has already achieved (even if only between RE players) significant tariff decreases.

Moreover, Eskom's own business model is now conflicted, with an imbalance between the generation business and the transmission and distribution business. There is an opportunity to split these businesses to achieve effective management and competitiveness of both. Current market developments, particularly the advent of IPPs, have fully exposed this.

New models for electricity generation and RE, gas and coal IPPs should be allowed

In the new scheme of things, IPPs should play an increasingly important role. Eskom's traditional dominance is successfully challenged by new market entrants. This transformation goes beyond the RE programme and includes the simultaneous coal and gas IPP programmes that are now underway.

Similar changes are happening in the embedded generation space, with private end-users and municipalities seeking increased levels of autonomy from traditional electricity supply options. Market opportunities in this space are discussed in a separate GreenCape MIR covering the Energy Services market.



© Image courtesy of Acciona Energy
Image: Local manufacturing of wind tower sections in Airport Industria, Cape Town - the first ever installation of concrete tower sections in South Africa.

5 – Funding and Incentives

This section briefly highlights the various incentives available in the utility-scale energy market. Thanks to the certainty and market view that it offers, the REIPPPP itself is an incentive. In addition, the South African government has put in place a number of other mechanisms to ensure the RE opportunities the country continues to offer remain competitive and attractive.

5.1. Local content and manufacturing

The local content mechanism — which is core to the REIPPPP and highlighted in [section 4.2](#) — is a significant incentive for investment in manufacturing. As we have already noted, South Africa has seen significant investment into RE manufacturing, with most of it landing in the Western Cape.

The Western Cape's success at attracting green technology manufacturing and, more specifically, the manufacturing of RE components — such as solar PV panels, inverters, wind towers and wind tower internals — is the result of the eco-system of supporting institutions highlighted in [Section 6](#) along with the proposed Atlantis SEZ, which will focus on greentech manufacturing.

More broadly, the SEZ programme sets out to designate specific areas in which pre-defined economic activities will be incentives. The aim is to have an SEZ in each province, with the selected economic activity positioned well within the province's current or envisaged competitive advantage. The incentives on offer include:

- **Reduced corporate income tax rate:** Qualifying companies will receive a reduced corporate tax of 15%, instead of the current 28% headline rate.
- **Employment Tax Incentive (ETI):** Aimed at encouraging employers to hire young and less-experienced work seekers, the ETI will reduce the cost to employers of hiring young people through a cost sharing mechanism with government.

- **Building allowance:** Qualifying companies will be eligible for an accelerated depreciation allowance on capital structures (buildings). This rate will equal 10% per annum over 10 years.
- **VAT and customs relief:** Companies located within a customs-controlled area (CCA) will be eligible for VAT and customs relief in line with the relevant legislation (dti, 2015c).

Other incentives available to investments into a designated SEZ will include:

- 12I Tax Allowance Incentive (12I TAI)
Deadline for applications is 31 December 2017.
- One-stop shop facility within designated SEZ area
- SEZ fund for infrastructure development within the designated area.

It is crucial to exploit the symbiotic relationship between local content and the designation of RE-related SEZs. This applies to the need for the effective execution of local content as well as the designation of appropriate SEZs – such as the proposed Atlantis GreenTech SEZ and the Northern Cape's proposed solar SEZ.



5.2. A conducive project development eco-system

Availability of finance and a solid financial regime are essential to the successful development of utility scale projects, and South Africa’s financial system participated significantly in financing the REIPPPP. South Africa’s big four banks — Standard Bank, FirstRand Bank, Nedbank and ABSA — have all financed projects, especially in the early rounds. In later rounds, private financiers have moved in and the market has seen an increase in funders interested in the REIPPPP. GreenCape’s members include a wide variety of these financiers as well as project sponsors.

A report from ratings agency Moody’s indicates that in 2015, South Africa’s green economy saw the fastest growth globally (IT Web 2016). A large part of this growth has been driven by the REIPPPP, which attracted the participation of the major South African banks and significant financing from various other institutions. Figure 12 shows the composition of debt providers in the first three rounds of the REIPPPP (Eberhard, et al. 2014).

5.3. Available general funding solutions for green economic activity

Table 3 and Table 4 present a wide variety of funding solutions available for green economic activities specifically related to RE investments, either into component manufacturing or actual projects. These lists are not exhaustive. Rather, they are indicative of more green-focused funds or incentives available, and provide potential leads or starting points to explore various options¹⁴.

Note: The links below are clickable in the electronic version of this MIR, which is available on our website. For further funding and incentives, please download the SA Business Directory for 2016/2017 on the GreenCape website.

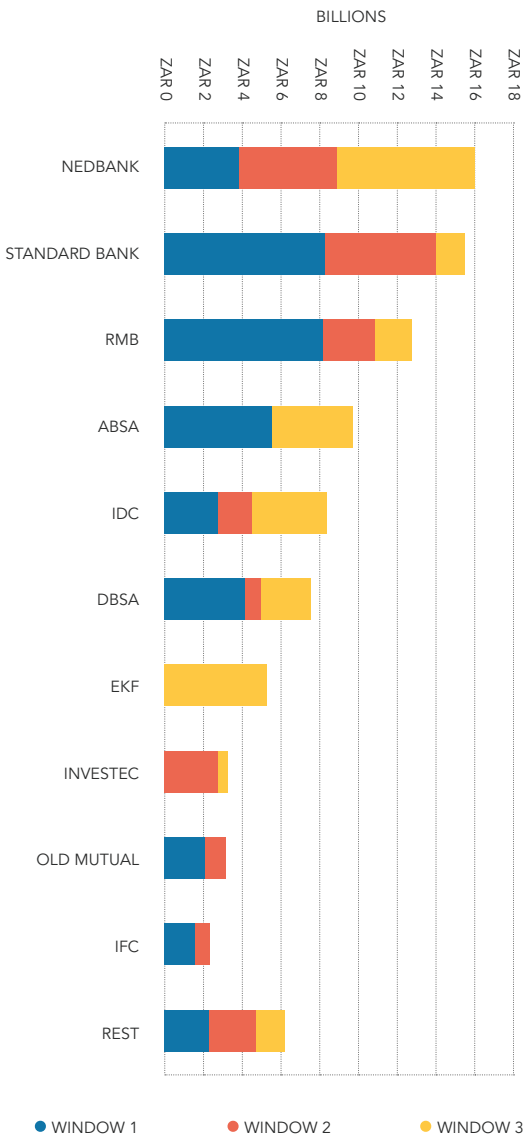


Figure 12: Spread of debt providers in bid windows 1 to 3 of the REIPPPP

¹⁴ Further to those below, the full range of government investment incentives can be found at <http://www.investmentincentives.co.za/>.

Table 3: General funding mechanisms and options available

| Entity Name | Opportunity overview | Product | Website |
|--|---|-------------------|--|
| Commercial Bank | | | |
| GroFin | Financing and supporting small and growing businesses across Africa and the Middle East. | Loan | https://goo.gl/liynqq |
| Investec | Power & Infrastructure Finance: Arranger and underwriter of debt for projects. Selectively develops and take equity in projects. | Loan Equity | https://goo.gl/CC4JJJa |
| Old Mutual | IDEAS fund: Invests in commercially viable developmental projects in SADC. | Equity | https://goo.gl/UUI6nh |
| Nedbank | Responsible lending that rejects transactions that do not meet the required- sustainability standards, and includes guidance to enable compliance. | Loan | www.nedbank.co.za |
| Nedbank / WWF | The Green Trust supports programmes with a strong community-based conservation focus in multiple areas, including climate change. | Grant | https://goo.gl/DMSiHA |
| SCF Capital Solutions | Unsecured working capital based on invoice or supply contracts. R250k - R5m is offered with interest rates of 2-3% per month. | Loan | http://www.scfcap.com/ |
| Development Finance Institutions | | | |
| German Investment Corporation | Amount ranging R4m-R30m for a duration of 4 years. | Loan Equity | www.deginvest.de |
| Development Bank of South Africa | For green initiatives related to the green economy. | Loan Equity Grant | www.sagreenfund.org.za |
| European Investment Bank | Direct and intermediated loans, minority investments in specialist private equity funds focussing on renewable energy and energy efficiency projects in emerging markets. | Loan | www.eib.org |
| GEF Special Climate Change Fund | Worth, ~USD350m, the fund is designed to finance activities, programs and measures under the following four financing windows: Adaptation to climate change (top priority), technology transfer, mitigation in selected sectors including: energy, transport, industry, agriculture, forestry and waste management, and economic diversification. | Grant | https://goo.gl/QNu2i |
| German Bank for Reconstruction & Development (KfW) | For public entities focussing on energy and climate change | Loan | https://goo.gl/RALjZ |

| | | | |
|---|--|-------------------|--|
| Global Environmental Facility | The Small Grants programme (SGP) invests in communities affected by environmental degradation. | Grant | https://goo.gl/qwA6Ed |
| International Finance Corporation | Funds private sector development projects. May fund smaller businesses through financial intermediaries that on-lend. | Loan Equity | https://goo.gl/k4Br3Z |
| Overseas Private Investment Corporation | Private project development focussed on renewable resources (and less on technology, health care, food and people). Involvement of a US company preferred. | Loan Guarantee | www.opic.gov |
| The African Development Bank | Development projects in the public and private sectors. | Loan | https://goo.gl/QnTCz4 |
| Global Innovation Fund | Invests in social innovations that aim to improve the lives and opportunities of millions of people in the developing world. | Grant Equity Loan | www.globalinnovation.fund/ |
| World Bank | World Bank Green Bonds are an opportunity to invest in climate solutions through a high-quality credit fixed income product. | Loan | https://goo.gl/RBZMG5 |
| Government Department | | | |
| Department of Higher Education and Training | National Skills Fund: Finances costs directly related to the delivery of learning – not infrastructure and/or ongoing operational costs of SETAs. | Grant | www.dhet.gov.za/ |
| Department of Science and Technology | 11D Tax Incentive: Undertaking R&D in South Africa qualifies for a 150% tax deduction of operational R&D expenditure. | Rebate | www.dst.gov.za/r-d |
| dti | Industrial Financing Loan Facilities encourage manufacturers to upgrade production facilities. | Loan | http://www.thedti.gov.za |
| dti | 12I Tax Allowance Incentive supports capital investment and training. Application deadline: 31 December 2017 | Rebate | www.thedti.gov.za/ |
| IDC | Industrial financing loan facilities (the Working Capital Component) to promote competitiveness in manufacturing while ensuring job retention in the sector ¹⁷ | Loan | https://goo.gl/FySmGc |
| Department of Small Business Development | The Black Business Supplier Development Programme (BBSDP) is offered to small black-owned enterprises to improve their competitiveness and sustainability. | Grant | http://bbsdpgrants.co.za |
| dti | Black Industrialist Scheme: Unlocks industrial potential through targeted and financial and non-financial interventions, described in the IPAP and other government policies. | Grant | http://www.thedti.gov.za |
| dti | Strategic Partnership Programme (SPP) supports manufacturing and services supply capacity of suppliers with linkages to strategic partner's supply chains, industries or sectors | Grant | http://www.thedti.gov.za |
| dti | The Capital Projects Feasibility Programme (CPFP) contributes to feasibility studies that lead to projects increasing local exports | Grant | http://www.thedti.gov.za |

¹⁷ The production incentive grants administered by the dti, as part of what was the Manufacturing Competitiveness Enhancement Programme (MCEP) has been suspended indefinitely. The loan component provided by the Industrial Development Corporation is still available

| | | | |
|--|--|---------------------------|---|
| dti | Critical Infrastructure Grant (CIG): A cost sharing grant for projects to improve critical infrastructure. | Grant | http://www.thedti.gov.za |
| Department of Small Business Development | Co-operative incentive Scheme (CIS): A 100% grant for registered primary co-operatives. | Grant | http://bbsdpgrants.co.za |
| Department of Small Business Development | The Shared Economic Infrastructure Facility (SEIF) provides an enabling environment to crowd in investment, mostly in townships, rural areas and the inner city. | Grant | http://bbsdpgrants.co.za |
| dti | Sector Specific Assistance Scheme (SSAS): A reimbursable 80:20 cost-sharing grant offering financial support to for-profit export councils, joint action groups and industry associations. | Grant | http://www.thedti.gov.za |
| dti | Export Marketing & Investment Assistance Scheme: Develops export markets for local goods and services, and recruits new foreign direct investment. | Other | http://www.thedti.gov.za |
| National Research Foundation | Research/study funding for public tertiary institutions. | Grant | http://www.nrf.ac.za |
| dti | The Technology and Human Resources for Industry Programme (THRIP) is a research and development programme. | Grant | http://www.thedti.gov.za |
| Small Enterprise Development Agency | Seda Technology Programme (STP) is responsible for the provision of technology transfer, business incubation and quality support services for small enterprise. Excludes R&D. | Grant | www.seda.org.za/ |
| Small Enterprise Development Agency | Direct Lending where individuals apply directly to sefa. Direct Lending: R50k - R5m with tenors of 1-5yrs. | Loan Guarantee | www.seda.org.za/ |
| Small Enterprise Development Agency | Wholesale Lending where financial intermediaries (Joint ventures, funds, RFI, MFI) are used. R20m-R100m with tenors of 1-5yrs. | Loan Guarantee | www.seda.org.za/ |
| South African Revenue Services | 37B and 37C: Deductions regarding environmental expenditure and environmental maintenance. | Rebate | https://goo.gl/sC5Wos |
| South African Revenue Services | 12K Clean Development Mechanisms (CDM) Tax Incentive (2009): South African businesses receiving CDM benefits are exempt from tax derived from such benefits, in Income Tax or Capital Gains Tax. | Rebate | www.sars.gov.za |
| Western Cape Government - DEDAT | Cape Capital Fund: Grows small businesses in agri-processing and oil and gas sectors: supports purchase or new equipment and and improvement of business processes. | Grants | https://goo.gl/OUHkJm |
| Technology Innovation Agency | Financial support to proposals based on merit. Includes R&D funding. | Grants Loans Equity | http://www.tia.org.za/ |

| Private Equity | | | |
|--|---|-----------------------------|--|
| Atlantic Asset Management | Focus: Intermediaries or businesses creating new jobs with a record less than 5 years. Investment range of R15m-R60m with a duration of 3-5yrs. | Loan | www.atlanticam.com/ |
| Business Partners | For: Businesses which actively develop, manufacture and provide goods and services by implementing measures and/or technology which reduce their adverse impact on the environment. Investment range: R500k-R30m. | Equity Loan | www.businesspartners.co.za/ |
| Adlevo Capital | Investments available to the public and private sector with technology-enabled business models. | Equity | www.adlevocapital.com |
| Treacle Private Equity | Equity capital to mid-market private and small cap listed companies in Southern Africa. | Equity | www.treacle.co.za/ |
| Sovereign Funds | | | |
| Entrepreneurial Development Bank of Netherlands (FMO) | Supports private sector entrepreneurship in developing countries: energy, agribusiness, food and water. | Loan Guarantee Equity | www.fmo.nl/home |
| French Agency for Development (AFD) | Development projects in energy, water, municipal sector support and biodiversity. | Loan Guarantee Grant | https://goo.gl/7QuiyH |
| German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) | International Climate Initiative (IKI), supports climate and biodiversity projects in developing countries. Fund size: EUR 120m, annually. | Grant | https://goo.gl/9qJEEb |
| Ireland Development Cooperation | Projects across various sectors involving an Irish Partner company. | Grant | www.idaireland.com |
| Japan Bank for International Cooperation | Focus areas: Energy & Natural Resources, Infrastructure & Environment and industry finance. Accessed through a Japanese business partner. | Loan Equity | www.jbic.go.jp/en/finance |
| Japan International Cooperation Agency | Intergovernmental work regarding technical cooperation. | Loan Grant | www.jica.go.jp/english |
| PROPARCO | Private sector development projects (energy, infrastructure, agriculture, etc.). | Equity Loan | https://goo.gl/XQ7IOb |
| United Kingdom: Prosperity Fund Programme | Fund to tackle climate change, strengthen energy security and promote an open global economy in emerging economies. | Grant | https://goo.gl/Rn4jLX |
| Embassy of Finland | Local Co-operation Fund: Supports initiatives in export and investment promotion, businesses and other groups. | Grant | https://goo.gl/AmNv2P |

| Venture Capital | | | |
|----------------------------------|--|----------------|--|
| 4Di Capital | An independent seed- and early-stage technology venture capital firm based in Cape Town. | Equity | www.4dicapital.com/ |
| AngelHub Ventures | Angel seed fund investing into lean start-ups with disruptive business models and technologies. Investment range: R500k-R5m | Grant | www.angelhub.co.za/ |
| Edge Growth | Edge Growth has 2 funds to fund Green projects. Investment range: R1m-R20m. For: SMEs that have limited equity or don't qualify for credit from a bank. | Loan Equity | www.edgegrowth.com |
| Hasso Plattner Ventures Africa | Invests solely in fast-growing and IT-driven companies in seed stage or growth stage. | Equity | www.hp-ventures.co.za/ |
| Other | | | |
| Anglo-American Zimele Green Fund | Targets opportunities that mitigate carbon, reduce energy and water consumption, and improve waste and emissions management in the Anglo-American value chain. The Fund provides funding of up to R10 million per project or business. | Grant | https://goo.gl/wr4cPF |

5.4. Renewable energy-related funding mechanisms and options

Table 4: Energy services and renewable energy-specific funding mechanisms available

| Entity Name | Opportunity overview | | Website |
|------------------------------------|---|----------------|--|
| Commercial Bank | | | |
| ABSA | Funding of up to R100 million to private projects aimed at driving EE/RE. | Loan Rebate | www.absa.co.za/ |
| FNB | Private project financing and credit line from AFD to finance EE/RE. | Loan | www.fnb.co.za |
| Merchant West | Seeking to establish relationships with suppliers of solar energy, related installations and end users/customers. | Loan | www.merchantwest.co.za |
| Nedbank | Project financing and credit line from AFD to finance private EE/RE. | Loan | www.nedbankgroup.co.za |
| Sasfin | Sasfin Eco Finance helps clients to claim cost-sharing grants from the dti, which provides manufacturing incentives for businesses that invest capital in EE/RE projects. | Grant | https://goo.gl/UJBeBA |
| Standard Bank | Private project financing and credit line from AFD to finance EE/RE. | Loan | www.standardbank.co.za |
| Development Finance Institution | | | |
| Energy and Environment Partnership | Focuses on local private sector RE/EE project opportunities that are close to commercial maturity but need a limited amount of 'bridging' finance (around R1m) to enable sustainable business growth. | Grant | www.eepafrica.org |

| Industrial Development Corporation | To fund EE and self-use RE projects, as well as EE/RE municipal projects included in their IDP. | Loan | https://goo.gl/TprS3L |
|--|--|----------------------------|--|
| Renewable Energy and Energy Efficiency Partnership | RE and EE projects in the private and public sector; aiming to leverage R50m of donor funding into R1b of private investment in clean energy solutions by 2022. | Grant | www.reeep.org |
| DBSA / SouthSouthNorth (SSNA) | The Sustainable Settlements Facility provides a financial product to scale up EE interventions for large-scale, low-income public housing. | Grant Subsidy Rebate | https://goo.gl/reNQI4 |
| The African Development Bank | Sustainable Energy Fund for Africa: Project Preparation Grants and Seed/Growth Capital. | Equity Grant | https://goo.gl/D71MEh |
| Government Department | | | |
| Department of Energy | Energy Efficiency Demand Side Management (EEDSM) Programme: Available to municipalities for EE projects. | Grant | https://goo.gl/JvlWgJ |
| Eskom | Integrated Demand Management (IDM) programme: Rebate received on purchasing and installing selected EE/RE products. | Rebate | https://goo.gl/3NR79d |
| South Africa National Energy Development Institution | 12L EE Tax Incentive: Tax incentives are being introduced for businesses that can show measurable energy savings. | Rebate | https://goo.gl/nDcWZ9 |
| South African Revenue Services | 12B RE Depreciation Incentive: Under section 12B of the Income Tax Act, businesses can depreciate investments in renewable energy and bio-fuel production at a rate of 50:30:20. | Rebate | https://goo.gl/IQkHr6 |
| Private Equity | | | |
| Inspired Evolution | Evolution One fund: Providing equity financing to innovative projects in clean energy (private or public) and clean technologies sectors in the SADC. | Equity | www.inspiredevolution.co.za/ |
| Triumph Venture Capital | Invests in the renewable energy sector with a focus on providing equity for growth capital financing, corporate acquisitions and recapitalisations. | Equity | https://goo.gl/ua9HRz |
| Venture Capital | | | |
| Persistent Energy Capital | Aimed at private sector and community based organisations | Loan Equity | https://goo.gl/yxJSrh |

Please note that there is another database for RE developments in the rest of Africa, compiled and hosted by the Africa-EU Renewable Energy Cooperation Programme (RECP) (RECP 2016)¹⁵

¹⁵ <https://www.africa-eu-renewables.org/funding-database-2/>

6 – The Western Cape: Africa's green economy hub

The Western Cape is a world-class investment destination.

The province provides businesses and investors with prime locations, modern infrastructure, a skilled workforce, low operational costs and an abundance of natural resources. It is also a sought-after place to live, with unrivalled natural beauty, vibrant culture, excellent schools and universities, and an outstanding quality of life. Cape Town has been ranked among the top 21 global investment destinations by Foreign Direct Investment (fDi) Intelligence, a division of the Financial Times.

A great place for green business

There are compelling reasons why the Western Cape Province is viewed by many as Africa's green economic hub. Coupled with a strong and rapidly growing market for green technology and services in South Africa and beyond, the Western Cape offers:

- Africa's renewable energy and cleantech hub, with a critical mass of leading companies present.
- Local presence of major professional services and financiers.
- Significant market opportunities for businesses and investors in agriculture, energy services, utility scale solar and wind, waste, water, bioeconomy and resource efficiency.
- A supportive government that has made ease of doing business and the green economy key priorities.
- Five universities with comprehensive R&D capabilities and dedicated green economy skills programmes.
- A range of investment incentives in proposed Atlantis Greentech Special Economic Zone (SEZ).

Supporting businesses and investors

The province also offers dedicated support for businesses and investors focusing on green tech and services, including:

GreenCape: Provides dedicated support and market intelligence to green economy sectors

Wesgro: The official investment and trade promotion agency for the Western Cape

SAREBI: A business incubator providing non-financial support to green entrepreneurs

SARETEC: Offers specialised industry-related and accredited training for the wind and solar industries

Businesses and investors will soon be able to make use of a convenient one-stop-shop for investment support, offered by the Department of Trade and Industry (dti), the WCG and the City of Cape Town. Called the Cape Investor Centre, it will house various institutions with a permanent or semi-permanent presence at the centre.

Market opportunities in the province and South Africa

Some of the major market opportunity areas in the province and South Africa in the next five years are outlined in the graphic on the next page (see individual MIRs and the GreenCape website for more information).

Major market opportunities: Western Cape and South Africa



Agriculture

Solar irrigation

R2.9 bn market (SA)

Conservation agriculture

R114 m market, ~R1 bn potential market (SA)

Controlled environment agriculture

R600 m potential market; 15% growth p.a. (WC)

Sustainable agriculture

Tools, data analysis, machinery rentals, local manufacturing, financing

Solar energy for packhouses

R1 bn potential market (WC)

Precision agriculture

Tech & services to improve water & energy efficiency



Energy services (SA-wide)

Solar PV systems & components

500 MWp installed capacity & R2 bn investments predicted (2016-2019)

Local manufacturing & assembly

Solar PV systems and components – systems require compliance with local content regulations

Energy efficiency retrofitting

100 000+ public buildings require retrofitting



Utility scale renewable energy (SA-wide)

Independent power production

Ministerial determination for 6.3 GW, more RE generation capacity: 1.1 GW (670 MW wind; 450 MW solar) p.a.

Rest of Africa

RE deployment in the rest of Africa, some programmes mirroring REIPPPP

Local manufacturing

Through REIPPPP local content requirements



Waste

Municipal PPP

Public-private partnership projects of R1.3 bn (WC)

Secondary materials

Robust & growing market for plastics, metals, e-waste, etc.

Construction & demolition waste

Growing reuse & recycling market



Water

Industrial water reuse

Recycling & resource recovery; R600 m market: (WC)

Water & energy

Opportunities for efficiency & use of renewables

Local resource development

Brackish water desalination, ground, storm & grey water



Bioeconomy & resource efficiency

Food value retention

R600 m value through improved cold chain management & waste reduction (WC)

Solar thermal

>R100 m industrial-scale installations, R3.7 bn potential market for agri-processing (SA)

Biogas

For LPG replacement, heating & electricity generation: >R450 m market, R18 bn potential market, 395 MW potential generation (WC)

R&D capabilities and skills

The region's five universities – University of Cape Town, Stellenbosch University, University of the Western Cape, the Cape Peninsula University of Technology and the George campus of the Nelson Mandela Metropolitan University – underpin all of this with comprehensive research and development (R&D) capabilities and dedicated green economy skills programmes.

Atlantis Greentech Special Economic Zone (SEZ): Investment incentives

The City of Cape Town established a greentech manufacturing hub in Atlantis in 2011 in response to the government's focus on localisation of manufacturing as part of the Department of Energy's Renewable Energy Independent Power Producer Programme (REIPPPP).

The City has made tracts of land available at low cost for purchase or lease by greentech companies through an accelerated land disposal process. A number of other financial and non-financial incentives are also on offer, including discounted electricity and rapid turnaround on development applications.

An application has now been submitted by the Western Cape Provincial Government for the Atlantis Industrial area to be declared a Greentech SEZ, a decision on which is expected in 2017. GreenCape's Atlantis SEZ team can assist with information, and facilitate access to permits, licenses, planning and development approvals, incentives and finance.



© Image courtesy of GreenCape
Image: Winds of change ushering in a new energy economy.

7 – GreenCape's support to businesses and investors

GreenCape is a non-profit organisation that drives the widespread adoption of economically viable green economy solutions from the Western Cape. Our vision is for South Africa to be the green economic hub of Africa.

We work with businesses, investors, academia and government to help unlock the investment and employment potential of green tech and services, and to support a transition to a resilient green economy.

We assist businesses by removing barriers to their establishment and growth and provide our members with:

- free, credible and impartial market information and insights
- access to networks of key players in government, industry, finance and academia
- an advocacy platform to help create an enabling policy and regulatory environment for green business

We assist local, provincial and national government to build a resilient green economy by providing:

- support on the development of standards, regulations, tools and policies
- expert technical knowledge on key sectors in the green economy
- access to networks of key players across business, academia, and internationally

Since inception in 2010, GreenCape has grown to a multi-disciplinary team of over 40 staff members, representing backgrounds in finance, engineering, environmental science and economics. We have facilitated and supported R17bn of investments in renewable energy projects and manufacturing.

From these investments, more than 10 000 jobs have been created. Through our WISP (Industrial symbiosis) programme, by connecting businesses with waste / under-used resources, we have to date diverted over 4360 tonnes of waste from landfill.

Our Market Intelligence Reports form part of a working body of information generated by sector desks and projects within GreenCape's three main programmes – energy, waste and resources.

Figure 13 below shows the different focus areas within each of our programmes.

Benefits of becoming a GreenCape member

We currently have over 800 members, and offer free membership. Becoming a member of GreenCape will give you access to the latest information regarding developments in the various sectors; access to tools, reports, and project information; and offer you the opportunity – through our networking events – to meet and interact with various stakeholders in the green economy.

Cross-border matchmaking through the International Cleantech Network

GreenCape's membership of the International Cleantech Network (ICN) gives our members access to international business opportunities in countries where other cleantech clusters are based (mainly Europe and North America).



1 Renewable Energy

Utility-scale projects, small-scale embedded generation, and localisation of component manufacture.

2 Energy Services

Commercial, industrial and agricultural energy efficiency and embedded generation; incentives and financing options.

3 Alternative Waste Treatment

Municipal decision-making and policy and legislative tools on alternative waste treatment options; small-scale biogas, recycling and reuse (dry recyclables, construction and demolition waste).

4 Western Cape Industrial Symbiosis Programme (WISP)

The team matches businesses to share unused resources, cut costs and create value.

5 Water

Water provision and economic development; greentech opportunities for water use efficiency, treatment and reuse.

6 Agriculture and Bio-Based Value Chains

Sustainable agriculture, valorisation of wastes to high value bio-products, including bio-energy.

Figure 13: GreenCape's focus areas

For investors looking for opportunities in South Africa, GreenCape's Cross-border Matchmaking Facility offers a business matchmaking facility for green firms and entrepreneurs.

The matchmaking team helps international inbound firms and entrepreneurs looking for South African partners in the green economy. The team assists with contacts, introductions and matches to South African businesses. They also offer matchmaking activities for trade offices, missions and other inbound interests. These services can be accessed via the ICN passport or directly with GreenCape.

To become a member or to get your ICN passport, please contact GreenCape or visit our website: www.greencape.co.za

8 – References

7.1. More on GreenCape's work in the renewable energy sector

The Renewable Energy sector desk is part of GreenCape's Energy Programme. The programme aims to encourage economic development and job creation through the transformation of the energy sector – both by increasing energy efficiency and the supply of cleaner energy. These two paths towards a lower carbon energy economy form the basis of GreenCape's work in this area.

Information sharing and networking platform

Throughout the year, GreenCape hosts networking functions that provide a unique platform for industry to engage experts and government on issues affecting their sector. Typically, these events are hosted at a neutral, accessible venue, free of charge to GreenCape members¹⁶, who enjoy easy access to good quality information and great networking opportunities. Topics covered in 2016 included: a change in the dti's local content evaluation criteria – which now focuses on comparing local content for specific components around each bid round, encouraging the localisation of pre-determined technology components; and RE market opportunities across the rest of the African continent. Beyond this, the organisation has been closely involved in supporting the continuation of the REIPPPP as well as developing a conducive environment for small-scale embedded generation.

International networks and the African renewable energy opportunity

As part of GreenCape's membership within the International Cleantech Network (ICN)¹⁷, we hosted a delegation of ICN members and their visiting member companies at the 2016 African Utility Week (AUW), where the organisation held its AGM. Over the course of that week (16-20 May 2016), a networking function hosting ICN member companies as well as GreenCape

members, took place, encouraging international collaboration. Similarly, business-to-business engagements were organised around AUW activities. GreenCape members are encouraged to make use of the ICN passport concept, which gives all our members seeking to do business in other ICN member states access to facilitated meetings, market intelligence and working facilities – as far as possible for the hosting ICN member organisation.

Continuing the international theme, significant focus has been put, this year, on developing an understanding of the African RE market opportunity. Our members are invited to collaborate in developing and reinforcing market understanding to enable market entry into the rest of the continent.

Advocacy

GreenCape is also involved in advocacy at both national and provincial government levels. Our role has been strategic input of facts and figures as well as an understanding of green economy developments at the ground level in public discourse around the country's energy future. Another example of our advocacy involves working with provincial commenting authorities for environmental authorisation of projects. The ultimate aim is to see an increased number of Western Cape-based RE projects, while reconciling this development with the need to protect the province's sensitive ecosystems. Benefits of becoming a GreenCape member We offer free membership and we currently have nearly 800. Becoming a member of GreenCape will give you access to the latest information about developments in various sectors; access to tools, reports, and project information. Our networking events for members will also offer you the opportunity to meet and interact with various stakeholders in the green economy.

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¹⁶ To register as a member visit our website <http://greencape.co.za/membership/members/show/>

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