



The Green Economy Sector in South Africa



towards full-scale industrialisation and inclusive growth



1. South Africa renewable energy opportunities

Large parts of South Africa's western and southern coasts and inland areas have some of the world's best wind and solar energy prospects. The scale and maturity of the global wind industry have made this a cost-competitive energy option compared not only to other renewable technologies, but also to many fuel-based technologies. While unpredictable, wind energy does not use water and components can be installed relatively quickly. Like solar photovoltaic (PV), wind is complemented by electric energy storage. Solar power is also particularly attractive for South Africa, given the country's high solar resource. Concentrated Solar Power (CSP) is a promising renewable energy-generation option in South Africa as it provides opportunities for energy storage, but is relatively small on a global scale.

1.1 The Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

The South African Department of Energy launched the REIPPPP in August 2011 to procure 17,8GW of renewable generation capacity by 2030.

The REIPPPP, combined with the completion of the technical work for solar and wind energy-manufacturing strategies, provides a significant opportunity for South Africa to become a major manufacturer of componentry renewable energy projects that will not only put electricity on the grid, but will also support industrialisation and job creation. It will also contribute to meeting South Africa's commitments for greenhouse gas emission reduction.

In the Climatscope 2014 report released by Bloomberg New Energy, South Africa was ranked third after China and Brazil for investment in clean energy, which accounts for more than 90% of these investments in Sub-Saharan Africa. Furthermore, the Renewables 2014 Global Status Report lists South Africa as one of the top 10 global investors in renewable energy.

Thus far, the REIPPPP has led to investment in renewable energy generation of more than R190 billion (US\$13 billion).

This is exclusive of additional investment in manufacturing capacity in this sector.

1.2 Investment requirements

Due to South Africa's legislative environment, the REIPPPP is run as a competitive bidding process instead of offering a feed-in tariff (FIT). Interested companies have to submit their bids through the REIPPPP, which is divided into a series of rounds. To date, the Department of Energy has procured 4 116MW. The department has:

- under bid window one entered into 28 agreements on 5 November 2012
- under bid window two entered into 19 agreements on 28 May 2013
- under bid window three announced 17 preferred bidders on 4 November 2013 and entered into 15 agreements on 11 December 2014
- under bid window four 77 bids were received on 18 August 2014

A request for proposals for round five of the REIPPPP is issued in the second quarter of 2016.

1.3 The bidding landscape

Due to the nature of the bidding process, the first four rounds have been competitive with prices for wind and solar energy generation showing significant reductions.

The table below sets out the current investment values, local content committed as well as the allocated and remaining MWs for the programme.

	Round 1	Round 2	Round 3	Round 4	Round 5
Approved bids	28	19	17	13	
Value of approved projects	US\$ 3.2bn	US\$2bn	US\$2.4bn	US\$1.6bn	
Local content value	US\$0.8bn	US\$0.8bn	US\$1.1bn	US\$0.7bn	

Local content % (average for all technologies)	23,7%	46,9%	47,2%	49,2%	
MW approved	1415.6	1044	1456	1121	1488

The Department of Trade and Industry (**the dti**) is in regular contact with various local and international players in this industry. Many foreign companies from developers to operators, EPC contractors and manufacturers have established a presence in South Africa. Most of these companies have formed partnerships with local companies to strengthen their local content requirements in the bidding process. **the dti** can help introduce prospective investors to potential local partners.

All relevant bidding documents and briefing documents can be downloaded from the website:
www.ipprenewables.co.za.

1.4 Local content requirements

The table below sets out the overall local content requirements for each of the technologies and bidding rounds.

Technology	First bid		Second bid		Third bid	
	Current threshold	Current target	threshold	target	threshold	target
Onshore wind	25%	45%	25%	60%	40%	65%
Solar Photovoltaic	35%	50%	35%	60%	45%	65%
Solar CSP without storage	35%	50%	35%	60%	45%	65%
CSP with storage	25%	45%	25%	60%	40%	65%
Biomass	25%	45%	25%	60%	40%	65%
Biogas	25%	45%	25%	60%	40%	65%
Landfill gas	25%	45%	25%	60%	40%	65%
Small-scale hydro	25%	45%	25%	60%	40%	65%

The local content requirements will increase for Round Five of the REIPPP.

1.5 Investment estimates

Renewable energy presents a significant opportunity for hundreds of billions of rands of private-sector investment aligned with the New Growth Path (NGP). The investment requirement associated with the IRP2010-2030 for solar and wind energy capacity amounts to R180 billion by 2020 and more than R400 billion by 2030. While spread over a longer period of time, this is equivalent in scale to the major infrastructure investments currently being made by state-owned enterprises like Eskom and will require significant financing support.

1.6 Manufacturing opportunities

Wind	Solar
Wind tower manufacturing Wind turbine blade manufacturing Gearbox Electronic controls Pitch and yaw system Nacelle housing and cooling	PV cells and modules PV inverters Controllers Batteries Transformers

1.7 Additional determinations

On 16 April 2015, the South African Minister of Energy announced a combination of energy supply and demand options to further increase the role of the private sector in producing additional electricity supply. This announcement included the following additional determinations:

- Expanded and expedited Bid Window Four for 1 800MW from all technologies in June 2015
- A new determination of 6 300 MW (to be approved by NERSA)
- Small IPP programme for projects between 1.5MW and 200MW in total. Thus far, 29 bids totalling 139MW
- Gas to Power Programme – 3 126 MW
- Coal Base load Programme – 2 500MW (limited to 600 MW per bidder)
- Co-generation Programme – 800MW

1.8 Commercial and industrial rooftop PV market (10kW-1MW) and small residential market (<10kW)

Contained in the 2011 Green Economy Accord signed by the South African Government, civil society, business and labour is a commitment that was made to develop a rooftop programme that aims to install 300 000 PV generation units at residential, commercial and industrial buildings by 2020.

The commercial and industrial rooftop PV market has grown rapidly in the past few years, with rooftop applications accounting for the largest number of installations, while ground-mounted applications had higher installed capacity. These systems have a payback period of about five to seven years and are increasingly seen by businesses and industries as a means to reduce their carbon footprint and long-term operating expenses. The commercial and industrial rooftop PV market is currently estimated at approximately 20-25MW per year with an average 3-5MW per annum growth. This number is set to increase substantially, influenced by higher electricity costs and reducing reliance on a constrained national grid. However, the small residential market segment provides for the biggest growth opportunity in the long-term with more than 10GW potential.

2. Waste management and recycling


The most recent national waste baseline indicates that South Africa generated approximately 108 million tons of waste in 2011. About 98 million tons was disposed of at landfill, with 59 million tons classified as general waste and 49 million tons as unclassified and hazardous. It is estimated that only 10% of all waste generated in South Africa was recycled in 2011.

The low recycling rate indicates that there are huge untapped opportunities for innovation such as industrial development and employment creation in the recycling sector. This is supported by the emphasis that the National Environment Management: Waste Amendment Act (2014) puts on the re-use, recovery and recycling of waste before disposal.




In acknowledging the challenges associated with the waste sector, Government has made further commitments through various programmes, including the National Waste Management Strategy (2011) and the National Cleaner Production Strategy for South Africa (2004) to promote waste minimisation initiatives with emphasis on industrial efficiency and increased recycling. The commitment to invest in waste-management projects that divert waste from landfill sites through employment-creating initiatives is further emphasised in the NGP (2010) and the National Development Plan (2012).

2.1 Investment opportunities



Through cost savings in materials and energy, recycling of waste has the potential to promote industrial resource development, greater energy efficiency, cleaner production and improved manufacturing competitiveness. Investments in the waste management and recycling sector have been proven to contribute towards the achievement of national targets on greenhouse gas emissions and energy security, mainly through waste-to-energy projects.



The Waste Management and Recycling sector is known for its significant potential to promote SMME development and employment-creation opportunities, through interventions such as organised waste collection systems, beneficiation of waste as an input resource and manufacturing of new products from recyclables.

Waste management in South Africa is largely characterised by landfill disposal rather than re-use and recycling of waste. This approach ultimately leads to long-term financial, environmental and social costs incurred by Government and society. Waste collection, sorting and recycling can potentially create significant employment opportunities, reduce input material costs, protect human health and the environment and promote industrial efficiency. The waste economy also offers exciting opportunities in small-scale waste-to-energy projects, such as biogas, and increased collection of dry recyclables as well as their absorption back into the manufacturing process to produce high-value secondary materials.

3. Energy efficiency



South Africa's economy is heavily dependent on coal. According to the World Energy Council, South African coal resources were estimated to be approximately 34 billion tons, accounting for 95% of African coal reserves and 4% of world reserves. Coal provided an estimated 72% share of the country's total primary energy supply in 2007 and accounts for approximately 85% of electricity generation capacity. Coal is also a major feedstock for the country's synthetic fuel industry. Energy supply is therefore heavily carbon-intensive. The Government of South Africa has set a target to reduce greenhouse gas emissions by 34% by 2020.

The energy sector is the largest contributor to greenhouse gas emissions, generating more than 80% of South Africa's emissions. In 2009, the International Energy Agency listed South Africa as the 13th highest emitter of carbon dioxide in the world.

Energy industries comprise emissions from fuels combusted by the fuel extraction or energy-producing industries. The main energy industries include electricity and heat production, petroleum refineries and the manufacture of solid or liquid fuels. Electricity generation and refineries are the most significant energy industries in South Africa, with electricity production from the national utility company accounting for more than 90% of total electricity generated in the country. The main fuel of power generation is coal, which is abundantly available, accounting for more than 92% of fuel used in electricity generation.

Given the above picture, it is clear that successful climate change mitigation in South Africa must focus on the energy sector. In this regard, energy efficiency measures, the roll out of renewable forms of energy and also a nuclear energy roll out would result in the largest emission reductions.



Currently, most new energy efficient machinery, equipment, software and control systems are imported into South Africa and the employment creation potential is therefore largely restricted to the operation, maintenance and installation of equipment and



the retro-fitting space. More research is required in South Africa to determine the full industrialisation potential of energy efficient technologies and services, but a number of products have been identified as having industrial potential, with solar water heaters probably being the best example.

Government and state-owned enterprises spend large amounts per annum on products and services related to public lighting, traffic lights and the electrical equipment used in building for heating and cooling. This presents a major opportunity to localise the manufacture of some of the large volume imported items that been fulfilling these needs up to now. The overall objectives are to increase energy conservation and security and to develop sustainable domestic markets to support a competitive local manufacturing industry.

Relevant incentives for the Green Economy:

- 
- 
- » **Critical Infrastructure Programme**
 - Infrastructure developments to enable primary investment projects
 - » **12I Tax Incentive**
 - Aimed at greenfield and brownfield investments in manufacturing capacity for either capital investments or training
 - » **DEA incentives: The Green Fund through DBSA**
 - The Green Fund aims to provide catalytic finance to facilitate investment in green initiatives that will support poverty reduction and job creation. The fund is additional and complementary to existing fiscal allocations supporting the transitioning of the South African economy to a low-carbon, resource-efficient and climate-resilient growth.
 - » **12L EE Incentive (managed by SANEDI):**
 - Section 12L incentives include all energy-efficiency projects that reduce energy use and is claimable until 2020. It is important to note that the tax incentive is available for savings in all energy forms

and not only electricity. The expected tax relief would be a 45 cents deduction on taxable income per kilowatt-hour of energy saved, subject to all the conditions in the 12L regulations being met.

3.1 Stakeholders

- **Government Departments**
 - Department of Trade and Industry - www.thedti.gov.za.
 - Department of Energy - www.energy.gov.za.
 - Department of Environmental Affairs - www.environment.gov.za.
 - Department of Science and Technology - www.dst.gov.za.
 - Department of Labour - www.dol.gov.za.
 - Department of Public Enterprises - www.dpe.gov.za.
- **Public Entities**
 - NERSA - www.nersa.org.za.
 - CSIR - www.csir.co.za.
 - Eskom - www.eskom.co.za
 - South Africa National Energy Development Institute (SANEDI) - www.sanedi.org.za.
 - Central Energy Fund (CEF) - www.cefgroup.co.za.
- **Key Financing Institutions**
 - Industrial Development Corporation (IDC) - www.idc.co.za.
 - Development Bank of South Africa (DBSA) - www.dbsa.org.za
 - Export Credit Insurance Corporation (ECIC) - www.ecic.co.za.
- **Industry Associations**
 - South African Solar Thermal Electric Association (SASTELA)
 - South African Photovoltaic Association (SAPVIA)
 - South African Wind Energy Association (SAWEA)
 - Sustainable Energy Society of South Africa (SESSA)
 - Environmental Goods and Services Forum of SA (EGSF)
 - Southern African Alternative Energy Association (SAAEA)
- **Trade Unions**
 - National Union of Metalworkers of South Africa (NUMSA)
 - Solidarity



the dti Campus
77 Meintjies Street
Sunnyside
Pretoria
0002

the dti
Private Bag X84
Pretoria
0001

CONTACT

Thenga Christopher Theka
Tel: +27 12 394 5620
Email: TCTheka@thedti.gov.za

Ntombi Jim
Tel: +27 12 394 1072
Email: NJim@thedti.gov.za



towards full-scale industrialisation and inclusive growth

