



Ministry of Foreign Affairs

Final Energy report South Africa

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International.*

Report South Africa



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1. South Africa General overview



Official name	Republic of South Africa
Area (km ²)	1.219.090 (29x Nederland)
Land Area (km ²)	1.214.470 (36x Nederland)
Population	54.841.552 (3x Nederland)
GDP per capita (2016 est) (WB)	\$ 5,274
Agriculture	corn, wheat, sugarcane, fruits, vegetables; beef, poultry, mutton, wool, dairy products
Industry	mining (world's largest producer of platinum, gold, chromium), automobile assembly, metalworking, machinery, textiles, iron and steel, chemicals, fertilizer, foodstuffs, commercial ship repair
CO ₂ emissions (tCO ₂ /capita)	7.77
Price of electricity (US cents/kWh)	15.1

Source: CIA Factbook, World Bank and Doingbusiness.org

2. Energy overview

Overview of the energy sector/General description

The South African economy is extremely energy intensive compared to international standards, with only a handful of countries having higher intensities. In addition, South African industrial energy efficiency is on average significantly lower than in other countries. This is an important factor, given that at the moment industry and mining consume over 60% of the electricity produced in the country, and the inclusion of commerce takes this figure to almost 75%.

Therefore, residential energy use makes up a far smaller portion of final energy demand than in other countries, and demand from poor households is even smaller. Only 16-18% of South Africa's electricity is used by residential consumers, an outcome of the energy intensive nature of the economy, and the extreme income differential in the country. [3]

South Africa's nominal installed electricity capacity is about 45,700 MW, although total net maximum capacity (nominal capacity minus the amount the power station uses to operate) is lower. According to South Africa's Department of Energy (DOE), Eskom supplies roughly 95% of South Africa's electricity and the remainder comes from independent power producers (IPPs) and imports. Eskom buys and sells electricity with countries in the region. [3]

South Africa plans to diversify its electricity generation mix. Currently, about 90% of South Africa's generation capacity is from coal-fired power stations, about 5% from one nuclear power plant, and 5% from hydroelectric plants, with a small amount from a wind station, according to South Africa's DOE. South Africa's renewable energy industry is small, but the country plans to expand renewable electricity capacity to 18,200 MW by 2030. South Africa has one nuclear power plant, Koeberg, with installed capacity of 1,940 MW. The country plans to expand nuclear power generation by 9,600 MW by 2030.[3]

In 2012, 72% of South Africa's total primary energy consumption came from coal, followed by oil (22%), natural gas (3%), nuclear (3%), and renewables (less than 1%, primarily from hydropower), according to BP Statistical Review of Energy 2013. South Africa's dependence on coal has led the country to become the leading carbon dioxide emitter in Africa and the 14th largest in the world, according to the latest (2011) EIA estimates. [3]

EIA estimates that South Africa's total oil consumption was 616,000 bbl/d in 2013. The petroleum consumed in South Africa comes mostly from its domestic refineries that import crude oil and its CTL and GTL plants. The country also imports petroleum products. In 2012, according to the South African Revenue Service as published by Global Trade Atlas (GTA), South Africa imported 110,000 bbl/d of petroleum products. [3]

The electricity supply crisis in South Africa has largely been stabilised. Municipalities now have space to look at sustainable energy solutions that will provide a reliable and secure supply of electricity into the future. Rapidly increasing electricity prices, significant decreases in the price of renewable energy and the economic impact of load shedding have created a large demand for viable alternatives energy sources. The clean energy revolution presents South Africa with an exciting opportunity to tackle numerous issues linked to the universal provision of safe and affordable energy to all citizens. Traditional energy development can be leapfrogged by transitioning directly to a more sustainable technology, while avoiding the dirty energy legacy of most developed countries. [7]

Primary energy use/Energy supply

Total Primary Energy Supply	ktoe
Coal	96339
Crude Oil	20065
Oil products	1967
Natural gas	4253
Nuclear	3189
Hydro	69
Geothermal, solar, wind, etc.	496
Biofuels and waste	15782
Electricity	-133
Heat	0
Total	142027

Source IEA Statistics 2015

Energy consumption

Total final consumption	ktoe
Coal	18290
Crude Oil	0
Oil products	26021
Natural gas	1742
Nuclear	0
Hydro	0
Geothermal, solar, wind, etc.	113
Biofuels and waste	11557
Electricity	17068
Heat	0
Total	74791

Source IEA Statistics 2015

Electricity use per sector

Final Electricity Consumption	GWh
Industry	121562
Transport	3447
Residential	37463
Commercial and Public Services	27228
Agriculture/Forestry	5516
Fishing	0
Other non-specified	3245
Finale Electricity Consumption	198461

Source IEA Statistics 2015

Electricity production

Electricity production	GWh
Coal (91%)	228752
Oil	183
Gas	0
Biofuels (solid biofuels)	310
Waste	0
Nuclear (8,6%)	12237
Hydro (2,6%)	3720
Geothermal	0
Solar PV	2183
Solar thermal	0
Wind	2270
Tide	0
Other sources	0
Electricity production	249655

Source IEA Statistics 2015

Transmission and distribution

The South African electricity sector is dominated by the national utility Eskom, which is responsible for the majority of generation, transmission and distribution of electricity. South Africa is however also home to Africa's biggest IPPs market, which is envisioned to contribute 30% of South Africa's future generation capacity. 137 municipal power companies, that are buying 40% of electricity generated by Eskom to supply end users, hold negligible generation capacity. Generation is currently dominated by coal power, however this dominance is expected to decline in anticipation of increased investments in gas, renewables, and nuclear power. Being an integral part of the South African Power Pool (SAPP), South Africa is both importing and exporting power from and to its neighboring countries. The electrification rate in South Africa is comparatively very high for the region, standing between 85 and 90%. [1]

Eskom owns, operates and maintains 95% of the national transmission network and shares the distribution network with ~187 licensed municipal distributors. Transmission and distribution losses

were 8.59% in 2015/2016. Given frequent blackouts in the recent past, partially as a result of aging infrastructure, Eskom has been focusing on the maintenance and refurbishment of the transmission and distribution network, in addition to network strengthening towards the achievement of N-1 Grid-Code compliance and the integration of new generation sources.

In order to give project developers an understanding of the available transmission and distribution capacity for integration of generators, Eskom Transmission published the Generation Connection Capacity Assessment for the 2016 Transmission Network (GCCA-2016), which has been updated (July 2015) to provide a 2022 view (GCCA-2022). The assessments have indicated a constrained transmission network, particularly in the Northern Cape, Eastern Cape and Western Cape provinces, where most of the successful RE-IPP projects are located. [1]

In order to allow integration of the committed generation capacity, ESKOM describes the envisioned transmission capacity requirements in its Transmission Development Plan 2016-2025. In terms of enhancing the transmission network as well as connectivity with neighboring countries, South Africa is contributing to the implementation of the Mozambique-Zimbabwe-South Africa (MOZISA) transmission project.

The Cities of Johannesburg and Tshwane are currently implementing smart prepaid meters with certain municipalities engaged in setting up pilot schemes for smart grids. In that context, the South African National Energy Development Institute (SANEDI) has also established the South African Smart Grid Initiative (SASGI) with the objective of developing relevant policies and regulations. [1]

South Africa's electricity system is constrained as the margin between peak demand and available electricity supply has been precariously narrow since 2008. In 2008, some coal mines had to halt operations because of power blackouts. In November 2013, Eskom requested that its largest industrial customers cut their consumption by 10% during peak demand times to avoid unexpected blackouts or load-shedding (scheduled power cuts). According to SAPP's 2013 Annual Report, South Africa's peak demand was forecast to reach 44,005 MW in 2013, exceptionally close to installed net maximum capacity. The SAPP forecast has peak demand growing to almost 53,900 MW (or by 20%) by 2025. According to Bloomberg, Eskom plans to spend \$49 billion to replace aging equipment and add new power stations to meet growing demand. [3]

With increasing interest in renewable energy deployment in the country, existing grid infrastructure problems have come to the forefront. In 2010, the DOE and National Treasury, in consultation with Eskom, mapped investor plans against existing Eskom infrastructure and grid planning, and indicated that there was sufficient connection capacity for REFIT IPPs until 2016. However, in 2011, Eskom did admit that it does not have the capacity to build the infrastructure needed to connect all IPPs to the grid. IPPs have, therefore, undertaken connection requirements themselves and at their own costs. Despite these commitments, existing maintenance backlogs in the country's electricity grid are putting severe constraints on the development and deployment of renewable energy. In efforts to alleviate the challenge, Eskom has initiated a smart grid pilot project network to enable demand side management through load limiting technology. [3]

Access to electricity (2015)	% of the population
Electrification total %	84 %
Electrification urban areas %	93 %
Electrification rural area %	68 %
Access to clean cooking	85 %

Source TRACKING SDG7: THE ENERGY PROGRESS REPORT 2018

Off-Grid Electrification

In 2013, electrification rates in South Africa were reported to be 90% in urban areas and 77% in rural areas, leading to an overall electrification rate of 85%. Eskom reports that 158,016 households were electrified during the year (March 2015/ March 2016), reaching almost 90% of all households electrified nationwide. [1]

The Integrated National Electrification Programme (INEP) targets to achieve universal access (defined as 97%) by 2025 through grid connection (90%) and Solar Home Systems (SHS) or other cost effective, non-grid RE technologies (7%) and has thus identified 300,000 households to be electrified with off-grid technologies.

INEP intends to achieve this through subsidizing grid connections, off-grid systems, and grid network infrastructure such as substations and HV inter-connections, through an annual budget of 400 million USD. The subsidy leads to ~200,000 grid connections and the distribution of 10,000 SHS per year. Companies can benefit from this subsidy by tendering to become concessionaires included in the INEP. In order to support poor households, the Government also provides 50 kWh/month of grid electricity per month to all households free of charge.

To roll out SHS, the Government has been utilizing a concession approach for specific geographic locations, with a predetermined number of SHS allocated. A single concessionaire (tendered) is appointed to a designated area within which it has the exclusive right to supply SHS services for five years. The concessionaire is furthermore responsible to maintain installed systems per the terms of a 20-year contract.

Off-grid technologies are provided on a fee-for-service basis, requiring customers to contribute a once-off connection fee (not exceeding R89) followed by a small monthly payment thereafter. This model was decided by the Government in order to ensure that concessionaires establish and maintain local presence in the areas they serve. The monthly service fee covers lifetime running costs, including the operation, maintenance, replacement of batteries, fee collection, customer service, support and management of the system. The Government subsidizes about 80% of the capital costs of the systems and 100% for those households that are classified as indigent, using the free basic services grant.

With EU support, the non-grid electrification programme is currently being redesigned to improve the quality of the service offering and strengthen institutional capacity, including the establishment of an off-grid electrification authority. The purpose of this proposed off-grid management authority is to ensure that the off-grid electrification programme is reinvigorated to ensure meaningful contribution to universal access as well as promoting off-grid energy access more generally. As such, the proposed enhancements to the programme include mini-grid/hybrid technology packages as well as biogas systems. [1]

3. Renewable energy

South Africa is endowed with multiple renewable energy resources, in particular solar and wind, which were also the most prominent technologies in the recent renewables procurement windows. The coastline of approximately 3,000 km provides favorable conditions for wind power throughout the country and large areas of flat terrain with high irradiation make an ideal ground for solar power. The east coast is tropical with large wood and sugar plantations creating promising bioenergy opportunities. Although South Africa is a water scarce country, opportunities for small-scale hydropower exist and have been exploited over the years. Tidal/wave power may become an important technology in South Africa in the future, given technical potential observed along the southwest coast. [1]

Bio-energy

Being a semi-arid country, the availability of bioenergy feedstock in South Africa is limited. However, the main sources of potential biomass utilization are wood waste (generated in the commercial forestry industry) and bagasse (generated in the sugar industry). Biomass is used commercially in the pulp and paper mills, and in sugar refineries where bulk from logs, black liquor (residue from paper production) and bagasse are burned to produce process heat and generate electricity.

The forestry sector produces a substantial amount of wood waste that is a potentially large resource for sustainable charcoal, gasification, or direct generation of power.

There is high potential for the production of biofuels from energy crops such as sugarcane, sugar beet, sunflowers and canola. However, the low energy density of these food crops makes it uneconomical to transport over long distances and hence they need to be used either close to where they are produced, or condensed for more economical transport. [1]

South Africa disposes of almost all of its refuse in landfill sites. It has been estimated that the total domestic and industrial refuse has an energy content of about 11.000 GWh per annum. This could be directly incinerated or converted into biogas and methane to produce electricity. There have been proposals for such schemes, and several landfill sites already produce electricity, including: the Durban Landfill-Gas-to-Electricity Project, Mariannhill and La Mercy Landfills, Ekurhuleni Landfill Gas Recovery Project, New England Landfill Gas to Energy Project, Alton Landfill Gas to Electricity Project, Nelson Mandela Bay Metropolitan Landfill, and the EnviroServ Chloorkop Landfill Gas Recovery Project.

A national Biomass Atlas is currently being prepared and should provide more detailed information on biomass potential. 51.5 MW of biomass power plants have been contracted so far and will be implemented by 2022. [1]

Other potential energy sources are dedicated energy crops (Jatropha, switch grass, triticale etc.). Household biogas digesters also have a large potential market share. [3]

A growing number of projects are being proposed for South Africa under the label of 'Waste to Energy' where waste (such as anatomical hospital wastes, bio-hazardous wastes, electronic scrap, municipal/ domestic and industrial waste, worn out tyres, solvents, plastics and sludge) is burned instead of coal. [3]

Wind

The Department of Energy (DoE), with international support, developed the Wind Atlas for South Africa (WASA I), which shows fair potential for wind energy in the coastal areas and inland. WASA II

currently ongoing covers the remaining areas of the Eastern Cape, KwaZulu-Natal and Free State provinces.

Wind power potential is generally good along the entire coast, with certain areas, such as the coastal promontories, showing strong potential. Inland areas noted with moderate potential, include the Eastern Highveld Plateau, the Drakensberg foothills in the Eastern Cape and KwaZulu-Natal. So far 3,366 MW of wind power has been contracted to be implemented by 2022. The IRP 2016 envisions 37,400 MW of additional capacity to be installed by 2050. [1]

Wind energy potential is estimated to have between 'modest' to 'abundant' prospects. Average wind speeds at 10 metres range from 4-5 m/s for the majority of the coastal areas of the country, increasing to approximately 8 m/s in some mountainous regions. [3]

Solar

South Africa has an average of more than 2,500 hours of sunshine per year and average direct solar radiation levels range between 4.5 and 6.5 kWh/m² per day. South Africa's Northern Cape is one of the most attractive solar resource areas in the world.

The Solar Energy Technology Roadmap (SETRM) is a joint initiative of the Department of Energy (DoE) and the Department of Science and Technology (DST) supported by CSIR, SANEDI, the International Energy Agency (IEA) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). SETRM estimated that 40 GW of Solar PV and 30GW of CSP can be developed in South Africa by 2050.

Currently contracted capacity, anticipated to be installed by 2021, amounts to 2,321 MW for solar PV and 600 MW for Concentrated Solar Power (CSP). The IRP 2016 envisions 17,600 MW of CSP and solar PV generation by 2050, in addition to the already contracted capacity. [1]

The solar PV rooftop market has been steadily growing without much Government support. A voluntary database of small-scale rooftop Solar PV installations suggests that by May 2015, these installations had reached a total of about 43.8MW. A majority of these Solar PV installations are in the commercial, agriculture, industrial and mining sectors. This is an area that still requires policy refinement at a national level. The combined commercial, industrial and residential installations of rooftop PV in the country is estimated to be between 3.5GW and 11.6GW by 2035. [1]

Since 2015 the Government is promoting the adoption of solar water heaters (SWH) in households and commercial buildings. The National Development Plan targets an additional 4 million SWH to be installed, resulting in a target of 5 million SWH by 2030. [1]

In the Western Cape Province, there has been an exponential increase in the installation of solar PV by the retail, commercial, industrial and agricultural business sectors. Installations are driven by supportive local government policy frameworks, above-inflation electricity price increases and decreasing technology costs. [8]

The GreenCape Smart Electricity project has focused efforts to create an enabling environment for rooftop PV and other small scale embedded generation (SSEG) technologies in Western Cape, which could lead to the installation of more than 200MWp of rooftop installations in WC by end of 2019/20. The market in installation, operation and maintenance of rooftop PV is estimated at R2bn over the period 2016 to 2019, with the potential to create 3000 medium and low skilled jobs over the period. [7]

In the Western Cape, the installed solar PV capacity as at Q2/2017 is 38MW. [8]

To date, the programme has designed a generic municipal SSEG wireframe, raised awareness among municipalities of the likely technical impact on their grids as well as the potential impact on municipal

revenue. The project has also highlighted the need for capacity building and support within municipalities. [7]

The local and national government support available to customers, including information on small scale embedded generation (SSEG) regulations for installing solar PV:

- Feed-in tariffs: Customers are 'paid' for any electricity they feed onto the grid, through reductions in their energy bills.
- Tax benefits
 - 100% accelerated depreciation in the first financial year. In effect, it equates to a 28% discount on the price of the solar system.
 - Tax allowance incentive designed to support greenfield and brownfield investments through support for both capital investment and training.
- Solar PV is VAT deductible: VAT registered entities can deduct the VAT portion of the solar PV system.
- Pay less carbon tax: As a low carbon energy source, solar PV will reduce the impact of the impending national carbon tax on businesses.
- Green Tourism Incentive Programme: Small and micro tourism businesses can qualify for up to R1m in grants when they switch to renewable energy sources.

[8]

Hydro

South Africa has low average rainfall. Seasonal flow of the country's rivers and frequent droughts or floods, limits opportunities for hydropower. The majority of the country's hydropower resource is concentrated in 6,000 – 8,000 sites in the Eastern regions. [3]

An estimated 247 MW potential for new small-scale Hydro development is believed to exist in the rural areas of the Eastern Cape, Free State, KwaZulu-Natal and Mpumalanga. South Africa only has an installed capacity of 38 MW. Apart from Eskom's installed hydropower capacity and number of privately and community-owned systems, it is estimated that around 60 systems have been installed in underground mining areas. No recent study has been conducted on the full potential of hydropower in South Africa. [1]

Geothermal

Geological conditions in South Africa generally preclude any large-scale geothermal resource discoveries, but with the recent energy crisis, new resources are becoming economically feasible. [3]

Wave Energy Potential

Detailed assessment of the spatial distribution of wave power off the southwest coast has been recently conducted. It was found that the average deep-sea resource ranges from 33 kW/m to 41 kW/m. [1]

Wave energy has the potential to contribute 33 TWh per year by 2050, in conjunction with other, less-used renewable energy resources. [3]

4. Energy efficiency

The South African economy is extremely energy intensive compared to international standards, with only a handful of countries having higher energy intensities. South African industrial energy efficiency is on average significantly lower than in other countries. [1]

In January 2008, the Department of Minerals and Energy, and ESKOM released a new policy document, called the "National Response to South Africa's Electricity Shortage". The plan includes work on the country's electricity distribution structure, and the fast-tracking of electricity projects by independent power producers. It also involves electricity co-generation projects between ESKOM and private industry, where the heat generated as a by-product of industrial processes, in sectors such as chemical processing, is captured to produce power. This can be used by the industries themselves or bought by ESKOM for the national grid. [3]

At the same time, the new plan outlines the importance of reducing demand by pricing electricity correctly as well as promoting energy efficiency and deterring, if necessary outlawing, energy inefficiency. The government is also set to introduce a rationing scheme that will reward and penalise customers based on their energy usage. [3]

ESKOM aimed to reduce demand by about 3,000 megawatts by 2012 and a further 5,000 megawatts by 2025, through an aggressive campaign which will include promoting the use of solar-powered geysers for household hot-water needs, as well as liquid petroleum gas for cooking. [3]

In 2015, ESKOM introduced load-shedding due to drought and insufficient investment having rendered existing capacity inadequate to meet demand. In addition to now heavily investing in expanding generation capacity, the Government is additionally promoting the adoption of solar water heaters (SWH) in households and commercial buildings. The National Development Plan targets an additional 4 million SWH to be installed, resulting in a target of 5 million SWH by 2030. Eskom is in parallel distributing energy efficient light bulbs (CFLs) and increasing awareness of energy efficiency measures. The Government has also introduced fiscal energy efficiency incentives for businesses and industries. [1]

The industrial sector contributes most to energy consumption in South Africa, providing 31.6% of demand in 2009. The residential and transport sectors also contribute significantly, 25.2% and 25% respectively in 2009. The industrial sector is also the largest consumer of electricity in the country, with 114,723 GWh of consumption in 2009, or 59.3% of the total domestic supply. [3]

Measures:Industry [3]

- Energy Efficient Motors Program: direct subsidies to the purchase of new motors (2007).
- Certification of energy auditors and accreditation of inspectors for EE standards.
- Energy management systems and audits.
- Promotion of ESCOs.

Utilities [3]

- DSM initiative to audit industrial, commercial and residential energy use (2006).
- Standard Offer Program (SOP) providing a rebate for energy savings.

Transport [3]

- Extra levies on inefficient vehicles used to cross-subsidize more efficient vehicles.

Residential [3]

- Distribution of CFLs at subsidized prices, mainly in areas with capacity bottlenecks.
- Mandatory standards and labels for appliances, vehicles and buildings.
- Mandatory energy audits for commercial buildings.
- Encouragement of the use of LPG as a cooking fuel, rather than electricity or other fuels.

Public [3]

- Educational campaigns, particularly in engineering and architecture.
- EE funding for government buildings.
- EE Monitoring and Implementation Programme (2010-14).
- Establishment of a South African Regional Energy Efficiency Centre (SAREEC).

[3]

5. Governmental framework

Relevant governmental stakeholders are:

Department of Energy (DoE)

DoE is responsible for energy planning, policy formulation and implementation, relevant sub-sectors include electricity generation, transmission/distribution, energy efficiency and electrification. It is within its mandate to draft the Integrated Resource Plan (IRP) that determines required generation capacity and distinguishes between capacity to be implemented by Eskom and IPPs. Its IPP office manages the public procurement programme for IPP projects based on coal, gas and renewable energy generation. Following the unprecedented number of contracts signed with IPPs, a formal Independent Power Producer Office is to be created to manage the obligations under these contracts in a more structured manner. [1]

The Electricity and Nuclear branch of the Department of Energy is responsible for electricity and nuclear-energy affairs, while the Hydrocarbons and Energy Planning branch is responsible for coal, gas, liquid fuels, energy efficiency, renewable energy and energy planning, including the energy database. [3]

The Department of Energy is the primary government institution responsible for energy regulation. No other government department takes an active role in the energy sector. [3]

National Energy Regulator of South Africa (NERSA)

The electricity, gas and petroleum pipeline industries are regulated by NERSA, an independent regulator established under the 2004 National Energy Regulatory Act. NERSA issues, among others, generation licenses and enforces their compliance, regulates all tariff increases proposed by Eskom, provides national grid codes, develops regulatory rules for relevant industries and determines the applicable standards. [1]

The Regulator is funded by monies set aside by Parliament, levies imposed by or under separate legislation, funds collected under separate legislation, charges for dispute resolution and other services rendered in terms of the National Energy Regulator Act, as well as a licence fee. [3]

South African National Energy Development Institute (SANEDI)

SANEDI is a state-owned institute, acting as DoE's implementation agency to reach energy goals. SANEDI's main function is to direct, monitor and conduct applied energy research, development, demonstration, and deployment as well to undertake specific measures to promote the uptake of green, low-carbon energy and energy efficiency in South Africa. [1]

It focuses on awareness-raising and increased uptake of "green" energy. Its portfolio includes data and knowledge management on energy, energy efficiency, fuel technology, low-carbon energy and transport, CCS, as well as energy end use and infrastructure.[3]

Eskom

The national utility Eskom is responsible for generation, transmission and distribution of electricity to industrial, mining, commercial, agricultural and residential customers and redistributors. Eskom is a single buyer of electricity produced by numerous IPPs and it oversees all grid operations, including the connection of new customers and provision of continuous service. [1]

Municipalities

137 municipalities are currently distributing electricity in certain areas of the country where Eskom is not directly supplying electricity to end-users. Historically more than 500 municipalities were engaged in electricity distribution. Certain municipalities also hold coal, gas and pumped storage generation capacity. [1]

Relevant IPP Associations

South African Renewable Energy Council (SAREC)

The main objective of SAREC is to promote the renewable energy sector in South Africa by acting as an umbrella body to the industry associations representing specific renewable energy technologies (e.g. wind, solar, biogas). SAREC facilitates public-private sector coordination and provides expert outcomes relevant for development of the RE industry in South Africa. [1]

South African Wind Energy Association (SAWEA)

Representing the wind industry, membership is made up of national and international entities in the entire wind energy supply chain. The association is affiliated to the Global Wind Energy Council (GWEC). SAWEA has been instrumental in securing a large share of the total planned capacity for wind energy in the IRP 2010. [1]

South Africa PV Industry Association (SAPVIA)

A not-for-profit association representing members largely made up of developers, manufacturers and service providers operating within the Photovoltaic (PV) industry. The association is devoted to promoting the growth of South Africa's Solar PV electricity market and representing the industry to provincial and national Governments. [1]

Southern African Solar Thermal and Electricity Association (SASTELA)

SASTELA is an association promoting the deployment of Concentrated Solar Power (CSP) stations, as well as the localization and industrialization of CSP components, in the SADC Region. [1]

Sustainable Energy Society of South Africa (SESSA)

SESSA is the longest standing sustainable energy association in South Africa, founded in 1974. It is a member of the International Solar Energy Society (ISES). SESSA supports energy efficiency and RE with a focus on Solar Water Heating and small-scale (residential) PV installations. [1]

South African Independent Power Producers Association (SAIPPA)

The association promotes the interest of IPPs, and considers all forms of energy Generation. [1]

Southern Africa Biogas Industry Association (SABIA)

Established to represent the biogas industry in South Africa, SABIA aims to promote the needs of industry stakeholders and facilitate the development of a prosperous biogas industry in Southern Africa. [1]

Liquid fuels and gas market

The Petroleum, Oil and Gas Corporation of South Africa (PetroSA, <http://www.petrosa.co.za/>), is the state-owned national oil and gas company, and has the monopoly on the oil, fuels and natural gas sectors; although the private South African fuels and chemicals company, SASOL (<http://www.sasol.com/>), also operates Gas-to-Liquid facilities. SASOL has the monopoly on the Coal-to-Liquid sector in South Africa. [3]

National Energy Efficiency Agency (NEEA)

Created in 2006 as a wholly-incorporated division within the CEF Group, it is responsible for the implementation of demand side management and energy efficiency projects in the country; the management of strategies for improving efficiency; awareness-raising campaigns and training programs in energy efficiency and co-operation with all agencies involved in the sector to ensure best practice. [3]

GreenCape

GreenCape is a non-profit organisation that drives the widespread adoption of economically viable green economy solutions from the Western Cape. Their vision is for South Africa to be the green economic hub of Africa. [6]

Focus areas:

- **Renewable Energy:** Utility-scale projects, small-scale embedded generation, and localisation of component manufacture.
- **Energy Services:** Commercial, industrial and agricultural energy efficiency and embedded generation; incentives and financing options.
- **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).
- **Western Cape Industrial Symbiosis Programme (WISP):** The team matches businesses to share unused resources, cut costs and create value.
- **Water:** Water provision and economic development; greentech opportunities for water use efficiency, treatment and reuse.
- **Agriculture and Bio-Based Value Chains:** Sustainable agriculture, valorisation of wastes to high value bio-products, including bio-energy.

[6]

6. Regulatory framework

The energy sector is regulated by a number of policies, laws and regulations to ensure diversification, affordability and availability of energy resources and to provide access to reliable energy services.[1] South Africa has two acts that direct the planning and development of the country's electricity sector:

- i. The National Energy Act of 2008 (No. 34 of 2008)
- ii. The Electricity Regulation Act (ERA) of 2006 (No. 4 of 2006).

National Energy Act 34/2008

The Act addresses security of energy supply, optimization and utilization of energy production and integrated energy planning. The Act supports the implementation of energy efficiency measures and creates the South African National Energy Development Institute as a public entity to undertake research for advancing energy development. The Act was later accompanied by regulations on mandatory provision of energy data. [1]

Focused on ensuring that diverse energy resources are available, in sustainable quantities and at affordable prices in support of economic growth and poverty alleviation. It further provides for energy planning, increased generation and consumption of renewable energies, contingency energy supply, and a variety of other measures to promote energy development.[3]

Electricity Regulations Act 2006– Regulation on New Generation Capacity (ERA, amended in 2015)

Since the 2006 Electricity Regulations Act in conjunction with 2011 regulations on new capacity, independent power producers are allowed to participate in a public bidding programme to install generation capacity from both renewable and non-renewable energy sources. Based on an Integrated Resource Plan (IRP) from 2010, an initial 3,392 MW have been connected to the grid. In November 2016, Cabinet approved the revision the Integrated Energy Plan (IEP) and the Integrated Resource Plan (IRP) that is currently undergoing public consultation.[1]

The regulation on new generation capacity (2011) establishes rules and guidelines that are applicable to the undertaking of an IPP Bid Programme and the procurement of an IPP for new generation capacity for coal, gas and renewables. It also facilitates the fair treatment and non-discrimination between IPPs and the buyer of the energy. The regulation is thus the legal backbone of the REIPPP. The amendment provides an extended definition of new generation facilities to include existing generation facilities not previously supplying electricity to the national grid and/or an extension or renewal of existing supply agreements from existing generation facilities for an additional period. [1]

White Paper on Energy Policy (1998) and White Paper on Renewable Energy (2003)

The 1998 White Paper defines specific objectives for energy sector:

- Increase access to affordable energy services;
- Improve energy governance;
- Secure supply through diversity;
- Stimulate economic development, and
- Manage energy-related environmental and health Impacts.

The Policy calls for achieving a more sustainable energy mix by development of the country's renewable energy potential and outlines challenges in energy supply and demand. The White Paper of 2003 mentions a non-mandatory renewable energy target for the first time.

[1]

Energy Policies for Sustainable Development in South Africa

Publication presents profile of energy in South Africa, assess trends and analyse some options for the future. Presents a profile of energy and sustainable development in South Africa and uses modelling tools and indicators to assess future policy options for the country.

National Response to South Africa's Electricity Shortage

Policy document published in 2008 by Department of Minerals and Energy. The plan includes work on the country's electricity distribution structure, and the fast-tracking of electricity projects by independent power producers. It also involves electricity co-generation projects between ESKOM and private industry, where the heat generated as a by-product of industrial processes, in sectors such as chemical processing, is captured to produce power. This can be used by the industries themselves or bought by ESKOM for the national grid. [3]

South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

REIPPPP, overseen by the DoE IPP office, replaced the feed-in tariff mechanism in 2011 and consists of a number of technology specific tenders for renewable energy. Since its inception, 6,590 MW were procured in 4+ bidding rounds to date, awarding 95 onshore wind, solar PV, concentrated solar and small biomass and hydro projects. As of October 2016, 54 power plants with the capacity of ~2,800 MW were fully operational and 15% of the delivered energy was supplied into the grid during system peak periods, alleviating pressure on the power system. The bidders offer prices for 20-year Power Purchase Agreements (PPA) with Eskom with governmental guarantees, with requirements on local content and black ownership. Eskom is currently, however, insisting to not sign PPAs in addition to the already existing ones, stating that additional generation would lead to capacity excess and negative implications for its future financial performance.

Specific rules for the renewable energy IPP programme are:

- 30 % of total bid value attributed to non-financial indicators such as economic development
- At least 40% of each project be owned by a South African entity with Level 5 contributor status (as defined by the final B-BBEE Codes of Good Practice, operational as of the date of publication in Government Gazette, No. 29617, 9 February 2007)
- Bid requirements also include shareholding by black South Africans across the value chain
- A minimum ownership of 2.5% by local communities is required as procurement condition
- No more than 60 percent of project capital investment consists of foreign currency.
- Local content requirements above 40%

[1]

2011 Integrated Resource Plan (IRP) 2010-2030 (updated in December 2016)

The IRP was adopted in 2011 as the official long-term government plan for new electricity generation capacity, including timing and quantities of electricity sources contributing to the country's generation mix. It aims to double the electricity generation capacity through a diversified energy mix: mainly coal, gas, nuclear and renewables. IRP includes a strong reliance on renewables: 42% of all added capacity by 2030 should be by renewable generation, equivalent of 17,800 MW (compared to 9,600 MW planned addition to country's nuclear capacity). To achieve this goal, the government has opened several bidding rounds to procure renewable energy under its REIPPPP. The second update of IRP has been released for public comment and engagement in December 2016. The IRP development and update is based on reduced electricity demand forecasts and thus reduced capacity needs. Renewables and gas are the most important capacity additions with nuclear power additions delayed to beyond 2030. [1]

2015 Integrated Energy Plan (IEP, not yet approved)

In line with terms set in the 1998 White Paper and in 2008 National Energy Act, the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. Compared to the IRP that focuses on electricity generation, IEP outlines a holistic energy plan for the country and aims to guide the development of energy policies and, where relevant, set the framework for energy sector regulations. The purpose of the IEP is to provide the future landscape of energy infrastructure investments and policy development. IEP addresses energy demand balanced with energy supply, transformation, economic and environmental considerations regarding available resources. This Plan was also released for public comments in December 2016. [1]

Integrated National Electrification Programme (INEP, updated in 2016)

INEP has been running since 2001 under the DoE as a complementary measure to the 1998 Energy White Paper with an objective to deliver universal energy access to rural households. Policy guidelines for implementing agencies (Eskom, municipalities and non-grid service providers) were released in March 2016 to provide a uniform set of standardized supply options and connection fees, as well as a uniform approach to tariffs and subsidies for customers of all licensed electricity providers. The Free Basic Electricity tariff was introduced under this programme in 2004. [1]

New Households Electrification Strategy (2013)

The Cabinet approved NHES in June 2013 with a target of providing 300,000 rural households for off-grid electrification through SHS installations and other cost-effective, non-grid RE technologies (e.g. mini-grid or hybrid systems). Under the NHES, all efforts are directed at aligning the programme with the goals of the UN's SE4All initiative. [1]

2030 National Development Plan (NDP, 2013)

The NDP outlines a long-term plan to eliminate poverty and reduce inequality in South Africa by 2030. In terms of energy, it calls for improving energy infrastructure in a sustainable way, increasing investments in energy efficiency, reducing carbon emissions by diversifying the energy mix and procuring of at least 20 GW of renewable energy by 2030. The NDP emphasizes the revision of the national electrification plan to ensure 90% grid access by 2030 with balance met through quality off-grid technologies. [1]

Small Projects Renewable Energy Independent Power Producers (IPPs) Programme

On 1 April 2014, the South African government launched stage one of its small-scale renewable energy tender programme, with 200 MW available across various technologies. The total allotment for small projects was later expanded to 400 MW. In October 2016, the energy minister announced the 10 preferred bidders for the first round of the Small Projects Renewable Energy Procurement Programme. Future rounds have not yet been announced.

Under the rules of the bidding programme each project will have a capacity of 1 – 5 MW. The price cap for each technology on 1 April 2013 was:

- Onshore wind – ZAR 1,000/MWh (\$108.2)
- Solar PV – ZAR 1,400/MWh (\$152.39)
- Biomass – ZAR 1,400/MWh (\$152.39)
- Landfill gas – ZAR 940/MWh (\$102.38)

The programme intends to strengthen the local supply chain through stringent local content regulations. The implementation has faced challenges given that financiers have been hesitant to finance small-scale power projects. [1]

2007 Biofuels Industrial Strategy and 2012 Biofuel Mandatory Blending Regulation

The South African Cabinet approved the national Biofuels Industrial Strategy in December 2007 to ensure the sustainable development of the biofuels industry. The regulation for mandatory blending of bio-ethanol (2 – 10%) and biodiesel (>5%) came into effect in October 2015. [1]

Carbon Tax

The levy was set out in its second carbon tax policy paper in May 2013, which established timelines and pricing, originally for implementation in 2015. The treasury published on 2 November 2015 a draft carbon tax bill for public comment, followed by draft regulations on the use of carbon offsets on 20 June 2016 and a modelling report on 10 November 2016. In October, finance minister Pravin Gordhan suggested that it would be implemented in 2017. An initial marginal carbon tax rate of ZAR 120/tCO₂ will apply. However, taking into account tax-free thresholds, the effective carbon tax rate will vary between ZAR 6 and ZAR 48/tCO₂. In phase 2 (from 2021), these thresholds may be reduced or replaced with absolute emission thresholds.

Energy Efficiency Strategy of the Republic of South Africa 2005

Sets out a national target (currently not mandatory, only a policy objective) for energy efficiency improvement of 12% by 2015 and provides for a number of “enabling instruments”. [3]

South Africa's Renewable Energy Policy Roadmaps

Renewable energy Roadmaps have been projected for electricity generation from wind, CSP and PV and for high and low SWH rollout programmes that reduce the demand for electricity. Six roadmaps were developed.[3]

National Cleaner Production Strategy 2004

Seeks to “enable SA society and industry to develop its long term full potential by adopting the principles of Cleaner Production and promoting the practices of sustainable consumption.”

In keeping with the new legislative and policy direction, South Africa has moved quickly to implement a comprehensive renewable energy procurement programme with a view to procuring the first 3,725 MW tranche of renewable energy contribution to the national energy mix as contained in the IRP, from Independent Power Producers. The SA government is also in the process of implementing its own 200 MW Sere Wind Farm and is investigating the implementation of a 5 GW solar park.

Unlocking South Africa's Green Growth Potential by the South African Renewables Initiative (SARi)
Determine whether and how South Africa’s renewables ambitions could be substantially increased as part of its broader industrial and economic strategy. Introduces scenarios for renewable energy development. [3]

Regulatory barriers

A lack of capacity at the institutional level can delay renewable energy deployment. In South Africa, there is a lack of Institutional capacity that has resulted in delays with bringing REBID power purchase agreements to financial closure. For example, to award contracts and complete the bidding procurement processes, the DoE was unable to meet deadlines for the first and second windows, and the third window was delayed over 8 months in order to give officials time to catch up as well as to assist bidders struggling to finalise outstanding bid commitments.

[3]

7. Access to finance

Laws and Regulations Governing Foreign Direct Investment

The government of South Africa is generally open to foreign investment, however scrutinizes merger- and acquisition-related foreign direct investment regarding its impact on jobs and local industry. Certain sectors require government approval for foreign participation, including the energy sector. South Africa's Broad-Based Black Economic Empowerment (B-BBEE) program has a significant effect on foreign investment. A BEE "Scorecard" rates a firm's commitment to economic transformation using five different dimensions—ownership, management control, skills development, enterprise and supplier development, and socio-economic development. Non-compliance with certain thresholds can result in penalty.

Non-residents may freely transfer capital in and out of South Africa, however transactions must be reported to authorities. Special Economic Zones were approved in 2014 and are in the process of being created. These zones will provide tax and tariff incentives for manufacturing in specified Locations. [1]

Potential Investment Incentives

South Africa Energy Efficiency Tax Deduction

On 1 November 2013, legislation was implemented whereby a tax deduction was approved for businesses that achieve energy savings. Draft regulations published in July 2015 indicate that the rebate will be increased from ZAR 0.45/kWh to ZAR 0.95/kWh. All businesses can apply to take part in energy reduction savings measures which will be deducted from their taxable income. [1]

Accelerated Depreciation Allowance

Renewable energy and biofuels producers receive a three-year accelerated depreciation allowance for capital equipment. Draft regulations published in July 2015 indicate that some types of PV plants may qualify for a shorter one-year, 100% depreciation. In particular, it is proposed to improve this incentive from three years to one year, for embedded PV plants with capacity up to 1 MW for self-consumption. [1]

Green Energy Efficiency Fund

The fund provides long-term credit financing to small- and medium-sized enterprises that are looking to become more energy efficient and introduce the use of renewable energy in their businesses. Companies that qualify for funding can receive a loan of between ZAR 1-50m (\$0.13-6.28m) at the prime lending rate (9% as of the end of March 2014) less 2% for larger amounts, with a tenor of 15 years.

ZAR 500m (\$62.8m) is available under the programme, which is sponsored by the Industrial Development Corporation and KfW. Disbursements from the fund have included various rooftop PV systems and a 7.8MW CHP plant, which has reduced its CO₂ emissions by 46,000 tons per annum. [1]

Green Fund

The Green Fund is a \$74m fund with a mandate to provide early stage financing for green initiatives and be a catalyst for job creation and poverty reduction. The initial allocation of the fund was ZAR 800m (\$74m). The total allocation available to a single project is up to ZAR 70m, which occurs across three stages: during stage 1 (R&D) a business can be awarded up to ZAR 15m, in stage 2 and 3 (preparation and implementation) ZAR 35m, and in stage 4 (expansion) ZAR 20m.

There are three themes under which the fund invests: green cities and towns, the low carbon economy, and environmental and natural resources management. The main focus areas under the

green cities and towns and low carbon economy are sustainable transport, renewable energy, biogas and biofuels, and energy efficiency/demand side management.

Funding instruments available include: grants (recoverable and non-recoverable), loans, equity (preference and ordinary) and financial guarantees. [1]

8. Opportunities and barriers for Dutch companies

Opportunities

South Africa has a very high electrification rate, with over 84% of people having access to grid based electricity. The country has an extensive coal fired capacity base which could be gradually replaced with renewable energy.

In South Africa a differentiation is made between small projects, under 1 MW installed capacity and large projects, being over 1 MW in capacity.

The small scale projects are no longer heavily regulated, this enables companies to deal directly with municipalities who are willing and able to pay a feed in tariff. Additionally municipalities enable wheeling, at a small fee, meaning you can also sell your electricity to a municipality in a different geographic region.

Another interesting development is the growth in the energy storage space. Tesla is currently developing a factory that produces batteries which will strongly increase available local storage capacity while lowering its costs. It is expected that in the coming six to 12 months energy storage will become commercial. This will in turn enable the development of interesting new business models for renewable energy.

For the past two years the experiences with utility scale renewable energy have been rather negative; not a single license for a large scale project was provided. Since February 15th 2018 however South Africa has a new president, Cyril Ramaphosa.

On April 4th 2018 a major breakthrough took place when 27 delayed IPP's, mainly for solar and wind were signed, with a total value of 4.7 billion USD¹. This offers interesting opportunities to Dutch parties who can develop larger scale renewable energy projects as it is anticipated that more IPP contracts will be signed in the future.

Another interesting development is the fact that solar PV has reached grid parity in South Africa, which results in many interesting business opportunities.

Finally South Africa also offers interesting bio-energy opportunities, this is an area where Dutch enterprises have unique expertise. Additionally RVO is already executing the BioVAISA project, regarding the identification of bio-based valorisation of organic residues in Western Cape

Challenges

South Africa is a rather mature market, which means one can expect fierce competition.

Additionally taking part in the REIPPPP has quite strict requirements regarding shareholding and local content which could create a barrier for Dutch companies to enter the South African renewable electricity market.

Even though solar power has reached grid parity, access to affordable finance for households remains an issue, there are no energy specific lending mechanisms for households. So far there has never been a case of a successful long term power purchase agreement service model in South Africa as customers are hesitant to sign contracts for more than 5-8 years. Customers would prefer to finance it themselves in case access to affordable finance would be available.

¹ <https://af.reuters.com/article/africaTech/idAFKCN1HB20R-OZABS>

Besides Eskom, there are formally only 3 other parties who own a licence to purchase electricity and sell it to customers. Power x is the only company that is actually using its license. This limits the options to select parties to sell to which in turn harms the negotiation position. Another potential challenge is the strength of the coal miners lobby. When the delayed IPP's were signed they tried to prevent it and threatened to stop supporting ANC if they wouldn't discontinue signing IPP agreements for renewable energy as they are afraid of the loss in coal mining jobs².

² <https://mg.co.za/article/2018-04-05-num-threatens-to-end-anc-support-over-green-power>

9. Dutch companies active in South Africa

ECN

Euro Africa Renewables*

Foundation rural energy services

Interdependent power*

Philips

Solar Works!*

Solarus*

Companies marked with * took part in an interview related to taking part in a green trade mission

10. Relevant Dutch support schemes

Subsidies & Programmes run by the Netherlands Enterprise Agency (RVO)

This chapter provides a selection of the programmes run by the Netherlands Enterprise Agency (RVO). For a full overview: <http://www.rvo.nl/subsidies-regelingen> (in Dutch)

For country specific information see:

<https://www.rvo.nl/onderwerpen/internationaal-ondernemen/landenoverzicht/tanzania>

Dutch international governmental network

The Dutch government has an extensive network of international offices. This network helps companies by advising them, making contacts for and opening doors. They are present on site, know local players, networks and the market, and know how to deal with language and culture barriers.

They can help Dutch entrepreneurs finding their way abroad when doing business internationally. They can help to find reliable, foreign business partners. They also can make a business partner scan. <https://www.rvo.nl/onderwerpen/internationaal-ondernemen/netwerken-en-contacten/buitenlandnetwerk>

Dutch Good Growth Fund (DGGF)

The Dutch Ministry of Foreign Affairs provides finance and insurance through the Dutch Good Growth Fund (DGGF) programme, facilitating development related trade and investment in over 60 countries. The fund consists of 3 parts:

Investing

The DGGF provides Dutch SMEs doing business in developing countries and emerging markets with customised financing. Do you want to invest in a DGGF countries, but have trouble getting the necessary financing? The DGGF facility Investing Dutch SMEs offers guarantees and direct financing with a repayment obligation, such as loans and equity investments in projects.

Local SMEs

Do you manage an investment fund that aims to improve the access of local SMEs to finance? Read more about the DGGF facility Investment funds local SMEs.

Exporting

If you need help exporting capital goods to one or more of the DGGF countries, the DGGF facility Exporting Dutch SMEs provides export credit insurance and export financing.

More information: Find information about the qualifications, procedures and transactions on english.dggf.nl.

The Dutch Good Growth Fund is a programme of the Dutch Ministry of Foreign Affairs. It is administered by the Netherlands Enterprise Agency (RVO.nl), Atradius Dutch State Business (for Dutch SMEs) and a consortium of PwC and Triple Jump (for local SMEs).

Dutch Trade and Investment Fund (DTIF)

The Dutch Trade and Investment Fund (DTIF) consists of two components: Investment and Exports. The fund was established in 2016 and replaces the Facility Emerging Markets (FOM) and Finance for International Business (FIB) financing instruments.

For whom?

Dutch companies wanting to invest in or export to foreign markets can apply for DTIF. The fund was established to stimulate the globalisation of Dutch companies.

Budget

DTIF can offer up to € 15 million in financial support for each project. The total budget is € 102 million.

For which countries?

DTIF is available to all countries, with the exception of those which are eligible for DGGF finance and countries under sanction by the United Nations Security Council or the European Union. These applications will be assessed with extra scrutiny. The sanctions policy of the Security Council and/or European Union will be maintained in all cases.

DTIF Investment

DTIF Investment offers support through loans, guarantees and direct or indirect shares with a repayment obligation. The Netherlands Enterprise Agency (RVO.nl) serves as the fund manager for this facility.

DTIF Exports

Interested in exporting capital goods to one or more DTIF countries? The DTIF Exports facility can help by offering export credit insurance and funding. Atradius Dutch State Business serves as fund manager for this resource.

Differences between DTIF and DGGF

DTIF is closely linked to the Dutch Good Growth Fund (DGGF). However, the two funds differ in terms of their target countries. DGGF is mainly focused on developing countries, whereas DTIF targets other foreign markets.

DTIF is open to all Dutch companies, whereas DGGF exclusively services businesses in the SME sector. DTIF does not offer funding for local SMEs, while DGGF does.

Energising Development Partnership Programme (EnDev)

The Energizing Development Partnership Programme (EnDev) gives households, social institutions and SMEs in developing countries permanent access to modern energy technologies and energy services. The projects take place in 24 countries in Africa, Latin America and Asia.

What does EnDev do?

EnDev supports the development of markets for modern energy facilities, especially in rural areas. For example, the development of renewable energy to cook, for lighting and for mobile phones. Part of the EnDev programme is the training and coaching of manufacturers and retailers of for example energy-efficient cookstoves and small solar energy systems. The programme also supports the construction of electricity connections via mini-grids and better network coverage. And EnDev stimulates the production of biogas digesters for household purposes.

Outcome-oriented

The EnDev program focuses on supply and demand. On the demand side, financial products can be developed that allow poor households to buy energy products. On the supply side, projects concern the quality and availability of these energy products.

The programme EnDev has no subsidy component. It publishes Specific Calls for Proposals in the form of Result Based Financing (RBF). The calls can be found on the website www.endev.info.

Background

EnDev is a partnership between the Netherlands, Germany, Norway, Australia, the United Kingdom and Switzerland. The programme is coordinated by the German Gesellschaft für Internationale Zusammenarbeit (GIZ) and the Netherlands Enterprise Agency (RVO.nl). RVO.nl does this on behalf of the Dutch Ministry of Foreign Affairs.

More information can be found at www.endev.info.

Starters International Business (SIB)

Exporting goods and services abroad offers your business more opportunities. It can lead to greater sales and serve as a solution to the challenge of increased competition in the domestic market. With its Starters International Business (SIB) programme, the Ministry of Foreign Affairs can help you move into foreign markets.

Vouchers

Export allows you to effectively spread your risks. Buy how do you start? What are your company's strengths? Which markets can offer opportunities and how can you successfully seize them?

Three different SIB vouchers can help you with your plans to take your business abroad:

- Individual coaching voucher (in Dutch) to hire a consultant / coach to look at your opportunities abroad and to work towards a concrete plan of action.
- Collective activity voucher (in Dutch) to participate in an outbound trade delegation or a joint trade fair presentation.
- Knowledge acquisition voucher to hire an international lawyer or tax consultant.

DHI

Subsidy scheme for demonstration projects, feasibility studies and investment preparation studies (DHI)

The DHI scheme supports Dutch enterprises that want to invest in or execute a project in emerging markets and in developing countries.

The DHI scheme is a tender programme. Enterprises can submit a tender during the tender periods. The 1st tender for 2018 closed on 29 March at 3 p.m. The 2nd tender in 2018 opens on 9 August and closes on 21 September, 3 p.m. (Dutch time).

3 modules

The DHI scheme consists of 3 modules:

- Demonstration projects: presentation of a technology, capital goods or service in one of the DHI countries.
- Feasibility studies: assessment of the profitability of a foreign investment in a product or service.
- Investment preparation studies: assessment of the technical and commercial profitability of an investment in a company in one of the DHI countries.

For whom?

DHI focuses on SMEs in the Kingdom of the Netherlands with international ambitions and an interest in emerging markets and developing countries. The SME test tells you whether you are an SME entrepreneur.

Countries

The DHI scheme is open to projects in all countries, with the exception of the European part of the Kingdom of the Netherlands and possibly countries that are subject to international sanctions.

More information (in Dutch) can be found on the Dutch RVO website.

Clean Cooking Programme

The Netherlands Enterprise Agency participates in the Clean Cooking Programme, which supports key stakeholder organisations in the cooking energy sector in Kenya, Ghana, Uganda, Ethiopia and Bangladesh. This programme is not a subsidy programme.

Developing markets for clean cooking

Every year there are more than 4 million deadly accidents in developing countries because of cooking in traditional ovens or on open fires. The commitment of international organisations and local governments, companies and NGOs can help the development of commercial markets for energy-efficient cookstoves with lower emissions or for smoke-free ovens. In this way, these ovens will become widely available to people in developing countries.

Connecting people and networks

The Global Alliance for Clean Cookstoves plays an important role in building international networks. Nationally, this work is done by National Alliances for Clean Cookstoves. The Netherlands Enterprise Agency supports the growth of these key stakeholder organisations.

11. Relevant international donors

The following international donors are active in Africa and are relevant for energy related projects in African countries. The overview below is a shortlist for more details we refer to the websites mentioned in the text.

The World Bank

The World Bank is a vital source of financial and technical assistance to developing countries around the world.

The Bank is made up of two unique development institutions owned by 184 member countries:

- the International Bank for Reconstruction and Development (IBRD)
- the International Development Association (IDA)

Each institution plays a different but supportive role in the Bank's mission of global poverty reduction and the improvement of living standards. The IBRD focuses on middle income and creditworthy poor countries, while IDA focuses on the poorest countries in the world.

Together they provide low-interest loans, interest-free credit and grants to developing countries for education, health, infrastructure, communications and many other purposes.

Target group: consultants, businesses, government, industries.

More information: <http://www.worldbank.org/>

International Finance Corporation (IFC)

IFC is a sister organization of the World Bank and member of the World Bank Group. IFC is the largest global development institution focused exclusively on the private sector in developing countries. The Bank Group has set two goals for the world to achieve by 2030: end extreme poverty and promote shared prosperity in every country.

The IFC applies their financial resources, technical expertise and global experience to help their clients and partners to overcome financial, operational, and other challenges.

IFC is also a leading mobilizer of third-party resources for projects.

More information:

https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home

Energy Sector Management Assistance Program(ESMAP)

ESMAP is a partnership between the World Bank Group (WBG) and 18 partners to help low and middle-income countries reduce poverty and boost growth, through environmentally sustainable energy solutions. ESMAP's analytical and advisory services are fully integrated within the WBG's country financing and policy dialogue in the energy sector. Through the WBG, ESMAP works to accelerate the energy transition required to achieve Sustainable Development Goal 7 (SDG7) to ensure access to affordable, reliable, sustainable and modern energy for all. It helps to shape WBG strategies and programs to achieve WBG Climate Change Action Plan targets: 28% of WBG financing with climate co-benefits; scale up 20 GW in renewable energy generation and integrate an additional 10 GW of variable renewable energy sources into grids over 5 years; mobilize \$25 billion in commercial funds for clean energy; invest at least \$1 billion to promote energy efficiency and resilient buildings by 2020; and, increase support to policy actions for sector reform, including for fossil fuel subsidies.

More information: <https://www.esmap.org/>

African Development Bank (AfDB)

The African Development Bank group (ADB) is a multilateral development bank. The Bank group's primary objective is to promote sustainable economic growth in order to reduce poverty in Africa. It achieves this objective by financing a broad range of development projects and programs through:

- loans;
- equity investments;
- technical assistance.

The Bank prioritizes national and multinational projects and programs that promote regional economic cooperation and integration. The Bank group consists of:

- African Development Bank (ADB);
- African Development Fund (ADF);
- Nigerian Trustfund (NTF).

Target group: Small and medium-sized enterprises (SMEs).

More information: <https://www.afdb.org/en/>

Sustainable Energy Fund for Africa: Project Preparation Grants and Seed/Growth Capital. It is an equity/grant. See also: <https://goo.gl/D71MEh>

The European Union (EU)

The EU invests in countries and regions within Europe (internal programs), but also in countries outside Europe (external programs). In addition, the EU also spends orders and services for its own use.

External programs

The European Commission spends part of the EU budget on aid programs in countries outside the EU. https://ec.europa.eu/europeaid/home_en

The responsibility for the implementation of external aid programs and the procurement of contracts lies with the Directorate-General (DG) for International Cooperation and Development (DG DEVCO) . https://ec.europa.eu/europeaid/general_en

DG DEVCO also does this for programs from, among others, the Directorate-General for Neighbourhood and Accession Negotiations (DG NEAR).

On the website of DG DEVCO you will find information on how you can qualify for:

- Financial support from the EU budget for relief activities.
- Assignments in the framework of the European aid programs.

You will also find practical information about procedures, conditions, contracts and more.

European Investment Fund (EIF)

The EIF's activity is centred upon two areas, venture capital and guarantees:

- EIF's venture capital instruments consist of equity investments in venture capital funds and business incubators that support SMEs, particularly those that are early stage and technology-oriented;
- EIF's guarantee instruments consist of providing guarantees to financial institutions that cover credits to SMEs.

Through the leverage effect of its venture capital and guarantee instruments, the EIF is able to contribute to the development of SMEs in the EU Member States and the candidate countries. Both instruments implemented by the EIF for SMEs are complementary to the Global Loans provided by the European Investment Bank to financial intermediaries in support of SME financing. EIF's instruments are implemented on commercial terms.

SMEs in search of finance are requested to contact an EIF intermediary in their country or region for information on eligibility criteria and application procedures.

Target group: Small and medium-sized enterprises (SMEs) in the European Union and the candidate countries

More information: www.eif.org

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH(GIZ)

GIZ is a provider of international cooperation services for sustainable development and international education work. GIZ has over 50 years of experience in a wide variety of areas, including economic development and employment, energy and the environment, and peace and security.

GIZ works for the German Government, European Union institutions, the United Nations, the private sector and governments of other countries. The German Federal Ministry for Economic Cooperation and Development (BMZ) is the main commissioning party.

The registered offices of GIZ are in Bonn and Eschborn. In 2016 GIZ had a business volume of around EUR 2.4 billion and 19,506 employees in 120 countries. Almost 70 percent of them is national personnel working in the field.

More information: <https://www.giz.de/en/html/index.html>

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- [2] <http://www.iea.org/statistics/statisticssearch/>
- [3] <http://www.reegle.info/countries/south-africa-energy-profile/ZA> (This policy & regulatory overview is not updated anymore since 2015. We decided to keep it online due to high demand but would like to make you aware of the fact that it might be outdated).
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Annex 2 Legislation

Source [5]

South Africa Carbon Tax

The levy was set out in its second carbon tax policy paper in May 2013, which established timelines and pricing, originally for implementation in 2015. The Treasury published on 2 November 2015 a draft carbon tax bill for public comment, followed by draft regulations on the use of carbon offsets on 20 June 2016 and a modelling report on 10 November 2016. On 22 February 2017, the National Budget announced that a revised Carbon Tax Bill would be published for public consultation and tabled in Parliament by mid-2017. On 25 October 2017, it was announced that the South African Cabinet approved the release of the carbon tax bill to Parliament for formal consideration and adoption. On 12 December 2017, National Treasury published the second draft of the Carbon Tax Bill, announcing that following a public consultation process – closing on 9 March 2018 – the revised bill is anticipated to be formally introduced to Parliament by mid-2018.

2017 BUDGET

The 2017 National Budget, announced on 22 February 2017, also said that:

- During the first phase of the tax (until 2020), there will be no impact on the price of electricity.
- A revised regulation for the carbon offset allowance, enabling firms to reduce their carbon tax liability, will be published by mid-2017.
- By the end of 2017, the government expects to provide clarity on the alignment of the carbon tax and carbon budget after 2020.

CARBON TAX MODELLING REPORT

The report found that the introduction of a carbon tax will help South Africa reach its emission-reduction goals, while the economy continues to grow. It argued that competitiveness impacts are overstated, though the levy will have a small impact on some macroeconomic variables such as employment, consumption and real wages.

DRAFT BILL

The consultation, which closed on 15 December 2015, provided an opportunity to comment on the design and technical details of the carbon tax. The finance minister will decide on the final tax rate, exemptions and date of implementation.

Once the consultation ends, the Treasury was to consider comments and then submit a revised Bill to Cabinet for approval for tabling in Parliament. Based on the annual state budget speech given on 26 February 2014, the tax is due to be implemented in 2016.

The draft carbon tax bill published on 2 November 2015 proposes the following features:

- A basic 60% tax-free threshold during the first phase of the carbon tax, from implementation date up to 2020
- An additional 10% tax-free allowance for process emissions
- Additional tax-free allowance for trade-exposed sectors of up to 10%
- Recognition for early actions and/or efforts to reduce emissions that beat the industry average in the form of a tax-free allowance of up to 5%
- A carbon offset tax-free allowance of 5-10%
- To recognise the role of carbon budgets, an additional 5% tax-free allowance for companies participating in phase 1 (up to 2020) of the carbon budgeting system.
- The combined effect of all of the above tax-free thresholds will be capped at 95%.

An initial marginal carbon tax rate of ZAR 120/tCO₂ will apply. However taking into account all of the above tax-free thresholds, the effective carbon tax rate will vary between ZAR 6 and ZAR 48/tCO₂. In phase 2 (from 2021), these thresholds may be reduced or replaced with absolute emission thresholds.

Emissions from the use of petrol and diesel will be subject to the tax. But fuel used by international aviation and maritime sectors will initially be exempt.

The Treasury is currently finalising regulations to create a carbon offset scheme. These will be released for public comment in early 2016. The Regulations with respect to the emissions intensity benchmark as required by the performance based tax-free allowance will be developed over the next six months based on inputs received from the respective industry associations. Such inputs should use as reference acceptable benchmark methodologies.

The original proposed tax was to be phased in from 2015, increasing by 10% per year up to 2019. The proposed rates per ton of CO₂ were:

2015: ZAR 120 (EUR 10.10)

2016: ZAR 132 (EUR 11.11)

2017: ZAR 145 (EUR 12.21)

2018: ZAR 160 (EUR 13.47)

2019: ZAR 176 (EUR 14.82)

A second phase was to run from 2020-25, with further phases "explored at a later stage".

The 2013 policy paper proposed a transition period from 2015-20 that utilised tax-free thresholds. All sectors would receive an initial basic tax-free threshold of 60%, with the power sector qualifying for up to 70% and some sectors up to 90% in the first phase. The agriculture and waste sectors would be exempt in the first phase.

Additional tax-free allowances of up to 10% would be made for exposure to international trade, emissions intensity and technical or structural limitations to reduce emissions. Offsets could be used for 5-10% of the carbon tax liability depending on the sector.

Process

The carbon tax will be administered by the South African Revenue Service (SARS). SARS will liaise with the DEA and be able to access the National Atmospheric Emissions Information System (NAEIS) which will contain emissions information as reported by companies. Energy use data reported to the Department of Energy will also be incorporated into the NAEIS which will strengthen the monitoring and verification system to support the implementation of the carbon tax

South Africa Biofuels Blending Mandate - Proposed

South Africa will require minimum shares of biofuel blending in both petrol and diesel starting from Q4 2015.

The regulation requires a minimum blend of:

- diesel: 5% biodiesel (B5)

- petrol: 2%-10% permitted range of ethanol (E2-E10)

The 2012 regulation on the Mandatory Blending of Biofuels with Petrol and Diesel was promulgated on 30 September 2013. At that time the commencement date for the blending mandate was

confirmed as 1 October 2015.

The biofuels pricing framework was expected to be released by the end of 2013 but the draft paper was only released in January 2014. The final position paper was pushed back to May-June 2014 and pushed back further to December 2014 but has yet to be released.

South Africa REIPPP Auctions - Expedited Bid Submission Phase

South Africa's expedited renewable energy bid window faces a tough road ahead. In 2015 it was announced that the bid window was scheduled to be held between Rounds 4 and 5 of the Renewable Energy Independent Power Producers Programme (REIPPPP). In June 2017, it was announced that permitted Round 4 projects would not reach financial close until 1Q 2018 - three years later than expected. This comes after Eskom, the state utility, refused to sign PPAs with Round 4 renewable IPPs. As such, future bid windows are now under threat of not being realised.

On 25 June 2015, the South African government launched a 1,800MW auction round as part of an 'expedited bidding' window, which closed on 11 November 2015. This window was meant to be held between Rounds 4 and 5 of the REIPPP. The winners were due to be announced on 11 December 2015 but this has been severely delayed owing to the fact that as of 1H 2017, Round 4 projects are yet to reach financial close.

The capacity allocation per technology for the expedited bidding window is broken down as follows:

- 650MW of onshore wind
- 520MW of solar PV
- 450MW of solar thermal
- 100MW of biomass
- 40MW of small hydro (projects are required to be below 40MW)
- 25MW of biogas
- 15MW of landfill gas

South Africa REIPPP Auctions - Round 4

Preferred bidders for Round 4 of South Africa's renewable energy auction program are yet to secure offtaker agreements with state utility - Eskom. As such, 1,121MW and 1,085MW of awarded and additional capacity across the various technologies is yet to reach financial close. In September 2017, the Department of Energy said the PPAs would be signed by end-October but at lower tariffs. However, this deadline was not met.

On September 1, 2017, the Department of Energy said the PPAs for 27 projects would be signed by October 28, 2017, at the renegotiated tariff of 770 rand per MWh or below. The plan was also to enforce heftier transformation and local ownership requirements. For BNEF analysis, see 'South Africa to Sign Renewables Deals at Cut Prices' under 'Related Insight notes'.

On April 11, 2015, the South African government announced the preferred bidders for Round 4 of its renewable energy auction program, with 1,121MW awarded across various technologies. Then on June 7, it awarded preferred bidder status to a further 1,085MW of capacity.

The additional 1,085MW of renewables given preferred bidder status on June 7, 2015 was split between 687MW of onshore wind and 398MW of solar PV.

On April 11, 2015, the Department of Energy awarded 1.1GW of renewables. The capacity allocation was broken down as follows:

- 685MW of onshore wind
- 415MW of solar PV

- 40MW of biomass
- 5MW of small hydro

Along with the announcements made in a press conference on April 11, the energy minister said the Department of Energy would issue a request for proposals to procure an additional 1.8GW under a new bidding window.

The initial list of specified technologies and capacity for the fourth bidding window were:

- 590MW of onshore wind
- 400MW of solar PV
- 60MW of small hydro
- 40MW of biomass
- 15MW of landfill gas.

South Africa REIPPP Auctions - Round 3B STEG

On 31 March 2014, the South African government launched a 200MW auction for solar thermal under Round 3b. It announced the winners in January 2015.

The tariffs for Round 3b are to be the same as Round 3 in which solar thermal received a ZAR 1,650/MWh base price and a peak time premium where the price increases by 270% for five hours.

The following bids were submitted:

- GDF Suez: 100MW Kathu parabolic trough plant
- Solar Reserve/ACWA Power: 100MW Kathu tower plant
- Emvelo: 100MW Illanga II parabolic trough plant

In January 2015, the Department of Energy awarded the GDF Suez and ACWA Power consortiums preferred bidder status.

South Africa Energy Efficiency Tax Deduction

On 1 November 2013, legislation was implemented whereby a tax deduction was approved for businesses that can achieve energy savings under the programme and can be claimed up to 2020. South African Revenue Services (SARS) published on February 13, 2016 guidance for the Energy Efficiency Tax Deduction

All businesses can apply to take part in energy reduction savings measures which will be deducted from their taxable income. The savings for businesses was increased from ZAR 0.45 (\$0.042) to ZAR 0.95/kWh (\$0.083) on taxable income per kWh of energy saved.

To take part in the programme, applicants must register with the South African National Energy Development Institute (SANEDI). Once approved, companies' savings are calculated as the difference between the year of inception and the previous year. On completion of the first year, the new base year will be the previous year.

On 22 July 2015, the National Treasury released draft tax legislation for public comment, which aims to implement the fiscal proposals outlined in the 2015 Budget speech. In particular, it proposed to increase the energy savings rebate from ZAR 0.45/kWh to ZAR 0.95/kWh. The increase has been brought about due to South Africa's current generation well below its installed capacity and is a positive move to increase energy savings.

The consultation ended on 24 August 2015 and the Bill was tabled in Parliament on 27 October. According to the proposals, the amendment is deemed to come into operation on 1 March 2015 and

applies in respect of the years of assessment commencing on or after that date.

On 13 February 2016, the South African Revenue Services (SARS) published guidance for the Energy Efficiency Tax Deduction

South Africa Small Project REIPPP Tenders

In 2016, the small IPP and cogeneration program was hit by further delays after the Department of Energy (DOE) announced that it was unclear on its current position in relation to the release of the revised RFP for the next bid window. In January 2017, the DOE appointed the 10 winners of the second stage. The 10 preferred bidders, which were announced for the first stage in October 2015, are still awaiting financial close.

STAGE 2

In January 2017, the DOE appointed the preferred bidders for stage 2 of the small-scale IPP program. A total of 10 PV plants of 5MW each were named 'preferred bidders'. The stage was open to PV, onshore wind, landfill gas, biomass and biogas projects but only solar bidders applied. The average winning tariff was 948 rand (\$74) per MWh.

The submission deadline for final bids for stage 2 was June 14, 2016.

STAGE 1

On 1 April 2014, the South African government launched stage 1 of its small-scale renewable energy tender program, with 200MW available across various technologies. On April 16, 2015, the Ministry of Energy said that future rounds will be simplified and a project funding mechanism is in the works. In October, the energy minister announced the 10 preferred bidders. In December 2016, the DOE announced there would be delays to the Bid Window.

The specified technologies available for bidding are:

- Onshore wind
- Solar PV
- Biomass
- Landfill gas

Under the rules of the bidding program each project will have a capacity of 1-5MW. The bidding process is broken down into two stages with 100MW available for each stage. Each stage is further broken down into two bidding windows with 50MW available in each.

The price cap for each technology on April 1, 2013 was:

- Onshore wind - ZAR 1,000/MWh
- Solar PV - ZAR 1,400/MWh
- Biomass - ZAR 1,400/MWh
- Landfill gas - ZAR 940/MWh

As part of a media address on April 16, 2015, the Department of Energy announced that future rounds will be simplified and it is working with financing partners to set up a project funding mechanism to make access to funds readily available for developers.

The 10 preferred bidders, as announced by the minister on October 5, 2015, were

- Adams Solar PV Project (Pty)
- Bellatrix Solar PV Project

- Du Plessis Solar PV4
- Steynsrus PV2
- Heuningspruit PV1
- Steynsrus PV1
- Klawer Wind Farm
- Hopefield Community Wind Farm
- George Small Scale Biomass to Energy
- Busby Renewables (Biomass).

South Africa Green Fund

The Green Fund is a unique national fund that seek to support green initiatives to assist South Africa's transition to a low carbon, resource efficient and climate resilient development path delivering high impact economic, environmental and social benefits. The Fund is managed by the Development of Bank of South Africa (DBSA) on behalf of Department of Environmental Affairs. As of June 2017, the Green Fund had committed its full funding allocation.

The initial allocation of the fund was ZAR 800m (\$74m). The total allocation available to a single project is ZAR 70m, which occurs across three stages. In stage 1 (R&D) it can claim up to ZAR 15m, in stage 2 and 3 (preparation and implementation) ZAR 35m and in stage 4 (expansion) ZAR 20m.

The core objectives of the fund are to promote high impact green projects, reinforce climate policy objectives, attract new resources for developing the green economy, and research and capacity building.

There are three themes under which the fund invests: green cities and towns, the low carbon economy and environmental and natural resources management. The main focus areas under the green cities and towns and low carbon economy are sustainable transport, renewable energy, biogas and biofuels, and energy efficiency/demand side management.

Funding instruments available include: grants (recoverable and non recoverable), loans, equity (preference and ordinary) and financial guarantees.

The allocation of the fund is broken down as follows:

- 75% for project development and investment in green projects;
- 20% for capacity building;
- 5% for policy and regulation.

South Africa Green Energy Efficiency Fund

The fund provides long-term credit financing to small and medium sized enterprises that are looking to become more energy efficient and introduce the use of renewable energy sources and technology in their businesses.

Companies that qualify for funding can receive a loan of between ZAR 1-50m (\$0.13-6.28m) at the prime lending rate (9% as of the end of March 2014) less 2% for larger amounts, with a tenor of 15 years.

ZAR 500m (\$62.8m) is available under the programme, which is sponsored by the Industrial Development Corporation and KfW.

Disbursements from the fund have included various rooftop PV systems and a 7.8MW CHP plant, which has reduced its CO2 emissions by 46,000 tons per annum.

Subsector

- Onshore
- PV
- Diesel Substitute
- Gasoline/Petrol Substitute
- All
- HVAC
- Lighting
- Materials
- BMS & EE Electronics
- Building Services
- Electric
- Petrochemical substitutes

South Africa Renewable Energy Independent Power Producers Procurement (REIPPP) Programme

In 2011, the South African government began holding reverse auctions with the aim of procuring 13GW of renewable energy. The auction program has been on hold since 2015, as Eskom has refused to sign the power-purchase agreements (PPAs) for the preferred bidders of Round 4 and an outstanding project from Round 3.5. In September 2017, the Department of Energy said the PPAs would be signed by end-October but at lower tariffs. However, this deadline was not met. By April 2015, four rounds of the auction program had been completed with 6,331MW awarded to developers.

On September 1, 2017, the Department of Energy said the PPAs for 27 projects would be signed by October 28, 2017, at the renegotiated tariff of 770 rand per MWh or below. The plan was also to enforce heftier transformation and local ownership requirements. For BNEF analysis, see 'South Africa to Sign Renewables Deals at Cut Prices' under 'Related Insight notes'.

BACKGROUND

The South African Department of Energy is responsible for planning and hosting the tenders. It issued the first Request for Qualifications and Proposals (RFP) for the Renewable Energy Independent Power Producers Procurement Programme on 3 August 2011. The electricity generated is sold at fixed tariffs to the state-owned utility, Eskom Holdings.

The capacity available per technology in each round is determined by the Department of Energy prior to the round and is adjusted accordingly as capacity is awarded. Auction bids are assessed on price and minimum economic development criteria, which are subject to change between auction rounds. Up until Round 3 all technologies had a tariff cap but the solar PV and wind tariff caps were removed due to the surge in interest from developers. All other technologies still have a tariff cap in place.

If selected, preferred bidders are to proceed with signing the implementation agreement, the power-purchase agreement, the direct agreement and connection agreements with the Department and the buyer by a given date. The contracts are for a fixed term of 20 years and are binding.

To date the following rounds has been completed:

- Round 1: 7 December 2011, 1.4GW allocated
- Round 2: 21 May 2012, 1GW allocated
- Round 3: 29 October 2013, 1.4GW allocated
- Round 3b: 11 December 2014, 200MW allocated to solar thermal projects
- Round 4: 11 April 2015, 1.1GW allocated and 7 June 2015, additional 1.08GW allocated

On 25 June 2015, the government also launched a tender for a further 1,800MW as part of an 'expedited bidding' window.

Process

Each bidding round is characterised by four stages:

- Bid submissions
- Bid evaluation period
- Announcement of preferred bidders,
- Signing and effective date of PPAs, direct agreements, implementation agreements and connection agreements and mandatory financial close.

If there are insufficient compliant bids to provide the maximum MW allocated per technology, all the bidders that have submitted compliant bids may be appointed as preferred bidders by the Department and might not have to undergo comparative evaluation.

Otherwise, for comparative evaluation between compliant bids, each is given a score based 70% on price and 30% on economic development criteria (EDC). The price score is calculated with reference to an equivalent annual tariff and the bid price is adjusted for inflation. The EDC are made up of:

- Job creation - 25%
- Local content - 25%
- Ownership - 15%
- Management control - 5%
- Preferential procurement - 10%
- Enterprise development - 5%
- Socioeconomic development - 15%

These criteria have minimum thresholds and target scores that are different for each technology and are subject to change between bidding rounds.

South Africa REIPPP Auctions - Round 1

The South African government launched the first of five bidding rounds on 3 August 2011 for up to the full allotment of 3,625MW. 28 preferred bidders were selected, amounting to 1,416MW. The first bidding window closed on 4 November 2011. A total of 53 bids were received, representing approximately 2,100MW of capacity.

On 7 December 2011, 28 projects were found to be compliant and were awarded preferred bidder status, to sign 20-year power purchase agreements with state utility Eskom Holdings. Of the full 3,625MW available across various technologies, the allocations awarded were:

- 634MW of onshore wind (of possible 1,850MW);
- 632MW of solar PV (of possible 1,450MW);
- 150MW of concentrated solar power (CSP) (of possible 200MW).

None of the other technologies submitted were able to meet the minimum qualification criteria.

The average tariff achieved at auction was:

- for onshore wind ZAR 1,143 per MWh;
- for solar PV ZAR 2,758 per MWh;
- for solar CSP ZAR 2,686 per MWh.

South Africa REIPPP Auctions - Round 2

The South African government selected 19 preferred bidders under the second of five bidding rounds on 21 May 2012, amounting to 1,044MW of a total 1,225MW available across various technologies. The second round bidding window closed on 5 March 2012. A total of 79 bids were received representing approximately 3,255MW of capacity.

On 21 May 2012, 19 projects were found to be compliant and were awarded preferred bidder status, to sign 20-year power purchase agreements with state utility Eskom Holdings. The capacity available in the round was 1,225MW available across various technologies. The allocations awarded were:

- 563MW of onshore wind (of possible 650MW);
- 417MW of solar PV (of possible 450MW);
- 50MW of concentrated solar power (CSP) (of possible 50MW);
- 14.3MW of small hydro (of possible 75MW).

None of the other technologies submitted were able to meet the minimum qualification criteria.

The average tariff achieved at auction was:

- for onshore wind ZAR 897 per MWh;
- for solar PV ZAR 1,645 per MWh;
- for solar CSP ZAR 2,512 per MWh;
- for small hydro ZAR 1,030 per MWh.

South Africa REIPPP Auctions - Round 3

The South African government launched round three of its renewable energy auction programme on 9 May 2013 for up to 1,473MW.

On 09 May 2013, the third bidding window was opened.

For the third round the specified technologies and capacity are:

- 653.6MW of onshore wind;
- 401.3MW of solar PV;
- 200MW of solar thermal;
- 120.7MW of small hydro;
- 60MW of biomass;
- 25MW of landfill gas;
- 12.5MW of biogas.

Financial close for Round 3 was delayed and the Department of Energy has instituted a staggered financial close which will be completed in November 2014.

South Africa Renewable Energy Targets (IRP 2010-30)

The Integrated Resources Plan (IRP) sets out the proposed generation capacity targets and new build fleet to be added to 2050. The plan is considered a "living plan" which sees it updated bi-annually to meet the new requirements. On November 22, 2016, the Department of Energy released an update to the IRP for public comment. But with the multiple changes in ministers in 2017, the Department of Energy is working on a new version, which is due to be published in 1H 2018.

2016 UPDATE

The 2016 update released on November 22, 2016 outlines the government's proposed energy strategy to 2050. It was to be open for consultation until February 15, 2017 but this was extended until March 31, 2017 based on requests from stakeholders. Under the base case, the IRP proposes new build over 2020-50 as follows:

- PV: 17,600MW
- Wind: 37,400MW

Unlike previous plans, it envisages no more solar thermal additions from 2020.

BACKGROUND

The IRP was introduced to determine the most cost effective mix to expand the country's generation fleet to meet future demand. The plan produces various scenarios based around the rate of economic growth, energy prices, capital costs and population growth.

On March, 17 2011, the initial plan was released with a target total installed capacity of 89GW by 2030. The capacity outlined for renewables was:

PV: 8,400MW
Wind: 9,200MW
Solar thermal: 1,200MW

In November 2013, an updated plan called for a total installed capacity of 81GW in 2030 under its base-case scenario. One of the main assumptions surrounding the plan was an annual projected economic growth rate of 5.4% – this was a large factor in the decrease in capacity. Under the updated version, the following amendments were made to the base case for renewables:

PV: 9,770MW
Wind: 4,360MW
Solar thermal: 3,300MW

The updated 2013 plan saw wind and nuclear capacity for 2030 decrease around 5GW each, while gas and solar thermal had their capacities increased.

South Africa Greenhouse Gas Emissions Reduction Target

On September 25, 2015, the government of South Africa submitted its partially conditional Intended Nationally Determined Contribution (INDC), committing to cut greenhouse gas emissions to a range of between 398 and 614 million metric tons of CO₂e by 2030.

The commitment builds on the 2009 Copenhagen Accord but states the emissions target as a wide range of emissions instead of a percentage reduction of between 29% and -9% using 2010 emissions of 563MtCO₂e as a base.

Sectors covered: All sectors, economy wide

Greenhouse gases covered: Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O).

2009 COPENHAGEN ACCORD

In the 2009 Copenhagen Accord, the South African government committed to reducing greenhouse gas emissions by 34% by 2020 compared to business as usual.

The government expanded on that pledge in a white paper in October 2011. It expects emissions to peak in 2020-25 and lays out two targets:

1. 34% reduction by 2020
2. 42% by 2025

To achieve these targets in the short term the government has identified carbon capture and storage in the synthetic fuels industry, mitigating non-energy emissions in agriculture and land use and transitioning the economy to more sustainable consumption and production patterns.

The medium-term plan involves low carbon electricity generation, upscaling of energy efficient technologies and the use of cleaner transport options.

South Africa Demand-side Management Programme

South Africa's utility demand-side management (DSM) scheme obliges state utility Eskom to implement efficiency measures either directly or through third-party energy companies. The scheme also includes provisions for load shedding in industrial facilities.

Energy saving targets are set by the Department of Energy whilst the energy regulator NERSA coordinates the scheme and ratifies the verification protocol. Certificates are generated either directly through Eskom's own activities or through third-party energy services companies (ESCOs). These are then submitted to NERSA at the end of each obligation period.

Approved energy efficiency interventions can occur in:

- Government-owned buildings
- Commercial buildings
- Residential buildings

Approved measures include:

- Solar hot water
- Ceiling insulation
- Efficient lighting
- HVAC efficiency

Funding for these initiatives can be recovered from the regulated electricity tariff at a predetermined rate of \$0.04/kWh. Technologies which have higher rebates are renewable energy, LED lighting and industrial/commercial hot water systems.

Additionally, industrial electricity customers with consumption in excess of 1000GWh must participate in the "Energy Conservation Scheme". Participants must submit information on baseline electricity consumption and achieve a consumption reduction target as determined by the energy minister for the sector in question. Further, the regulator can impose penalty tariffs for energy consumed above the baseline.

Funding method

Rate-base recovery.

South Africa Green Economy Manufacturing Grants

The Industrial Policy Action Plan (IPAP) provides incentives for manufacturers within the clean energy sector in South Africa. IPAP 2017/18-2019/20 was launched on April 4, 2017.

The following grants are available to manufacturers under IPAP:

The Enterprise Investment Programme provides cash grants for local manufacturers and foreign investors looking to expand or construct new production facilities. The qualifying grant is for 15-30% of the investment cost of qualifying assets.

The Foreign Investment Grant is available for foreign companies who move new machinery and

equipment to South Africa. The maximum grant available cannot exceed ZAR 3m and the cost of relocating, or 15% of the value of new machinery and equipment relocated from overseas.

The Manufacturing Competitiveness Enhancement Programme offers incentives to existing manufacturers who raise their competitiveness while retaining jobs. The support available to manufacturers are production incentive grants and industrial financing loan facilities. This program will run until 2018 and funds are limited, depending on when applications are submitted.

South Africa Accelerated Depreciation Allowance

As from 1 January 2016 Section 12b of the Income Tax act (South Africa) was amended from a three year (50% – 30% – 20%) accelerated depreciation allowance on renewable energy to an even quicker depreciation allowance of ONE year (100%).

Originally, renewable energy and biofuels producers received a three-year accelerated depreciation allowance for capital equipment. In 2016 draft regulations indicated that some types of PV plant may qualify for a shorter one-year, 100% depreciation. This came into effect on 1 January.

The benefit is now available over a one-year period with:

100% deductible in year 1

It is applicable to capital equipment for wind, solar, small hydro, biomass and biofuels production.

This accelerated depreciation allowance came about from a proposal in the 2015 draft Taxation Laws Amendment Bill that the definition of solar energy be amended to distinguish between photo-voltaic solar energy of more than 1 megawatt, photo-voltaic solar energy of less than 1 megawatt and concentrated solar energy. The amended Section 12b provision now provides for an accelerated capital allowance of 100% in the first year, in respect of photo-voltaic solar energy of less than 1 megawatt.

Section 12B of the Income Tax Act No. 58 of 1962, as amended (the 'Act'), provides for a capital allowance for movable assets used in the production of renewable energy. More specifically, it allows for a deduction equal to 100% basis in respect of any plant or machinery brought into use in a year of assessment for the first time and used in a process of manufacture or any other process which is of a similar nature. It is important to note that the allowance is only available if the asset is brought into use for the first time by the taxpayer.

South Africa Integrated Electrification Programme

The plan calls for universal access to electricity by 2025 using the most suitable options, from grid expansion to solar home systems. In 2017, some 85% of people had access to power. On March 23, 2016 the Department of Energy published a suite of supply policy guidelines for the Integrated Electrification Programme 2016/17 and the 2017 Treasury Budget review announced on February 22 that this program would receive a grant of 19.6 billion rand over the next three years.

The program subsidizes a portion of the capital costs of connections made toward meeting the electrification targets. The latest guidelines outline the connection fees approved by the energy regulator and tariff rate per supply option for electrification. Customers are not forced to accept a specific supply option.

It was cheaper to do more connections at the beginning of the electrification program due to the large capacity that was available on existing infrastructure. Most of the outstanding connections are in the heart of rural areas and are more expensive to connect. The subsidy levels for 2016/17 were:

- Rural connection: 19,500 rand
- Urban connection: 18,500 rand
- Infill/ post connection: 3,500 rand.

According to the 2017 Treasury Budget review, some grant consolidation is expected in future, especially in urban areas. The National Treasury is engaging with other stakeholders on the possible incorporation of integrated national electrification programme (municipal) grant allocations for metropolitan municipalities into the urban settlements development grant in 2018/19. This would reduce the number of separate grants transferred to metropolitan municipalities.

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