



SOUTH
AFRICA

Factsheet

2020

Investing in South Africa's Green Economy Sector

Opportunities in the Clean Energy and
Transport, Waste, Water and Sanitation Sectors



the dti

Department:
Trade and Industry
REPUBLIC OF SOUTH AFRICA

investSA

South Africa's Clean Energy and Transport Sector

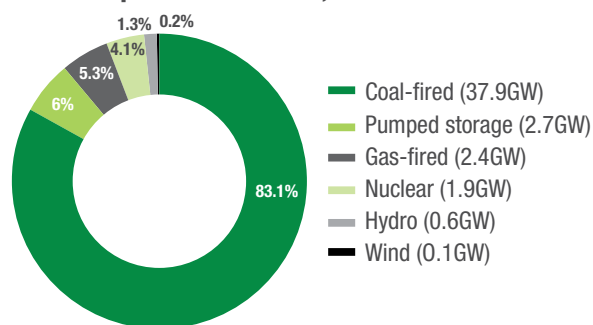
- > State-owned Eskom accounts for about 90% of South Africa's electricity generation capacity. The remaining 10% is provided by independent power producers (IPPs).
- > South Africa is currently highly dependent on coal-fired power stations for its energy supply.
- > Utility-scale projects in South Africa's clean energy sector are driven by the Renewable Energy Independent Power Production Procurement Programme (REIPPPP), which has attracted investments of close to R202bn since its inception in 2011.
- > A total 6 422MW of renewable energy supply had been procured between 2011 and June 2018.

75%

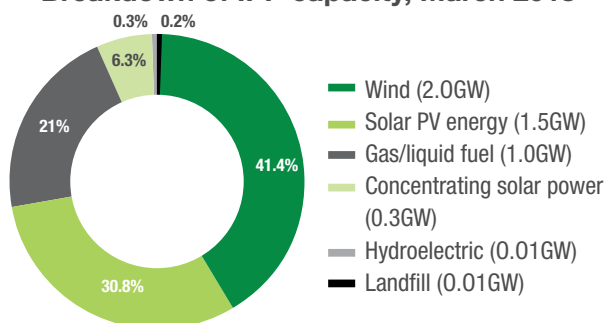
of South Africa's electricity comes from coal-fired power stations

R202bn invested in renewable energy since 2011

Breakdown of capacity of Eskom-owned power stations, March 2018



Breakdown of IPP capacity, March 2018



Why invest?

Favourable climatic conditions

Thanks to its climatic conditions South Africa has one of the highest potentials for solar energy. Northern Cape province has some of the world's best conditions for solar energy generation.

Up to **6.5kWh/m²** average solar-radiation levels



Up to **434TWh** per year supply gap in 2050

High load factor

According to the CSIR, over 80% of South Africa's land mass has enough wind potential to achieve a 30% average annual load factor. This places South Africa's wind potential ahead of Spain and Germany which have average load factors of their entire wind fleets at 25-27% and 20-23%, respectively.



30% average annual load factor for wind turbines

Rising supply gap

Without major investments in electricity generation, South Africa will face an electricity supply gap of between 286TWh/year to 434TWh/year. Given the recent improvements in cost-competitiveness of renewable energy technologies, these technologies hold vast potential to fill the rising supply gap.

Nascent market for energy efficiency

While the current market for energy efficiency is relatively small, it holds sizeable potential. According to GreenCape, the market for energy efficiency could reach R21bn by 2035.



R21bn market for energy efficiency by 2035

Robust market growth

Rooftop solar PV is one of the key drivers for energy services in South Africa. Especially, the commercial and industrial sector presents major opportunities for rooftop solar due to their relatively high electricity costs, extensive use of electricity and favourable size of premises.



R75bn market for rooftop solar PV by 2035

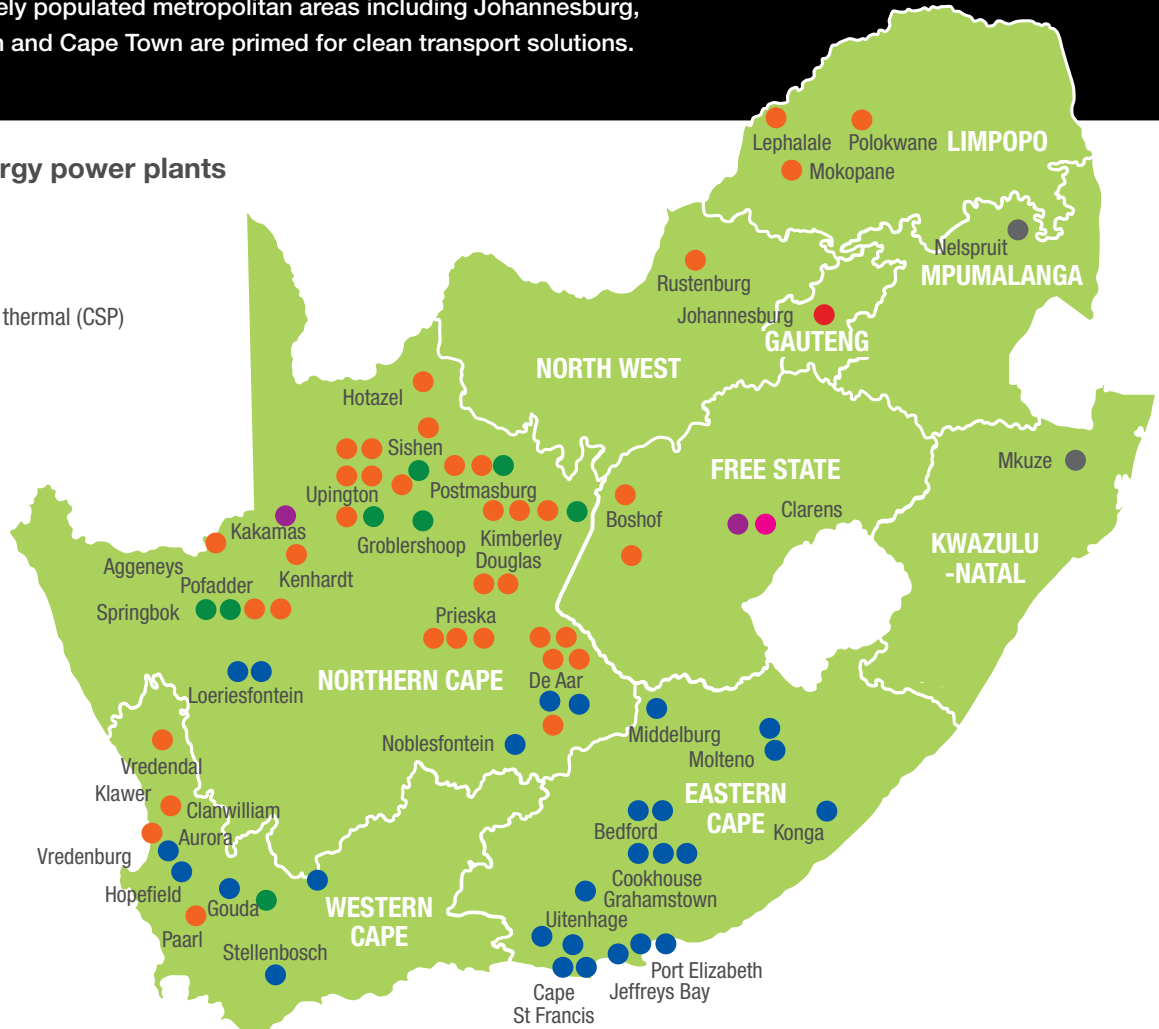
Where to invest?

- > Due to its climatic conditions, the Northern Cape is the country's hub for utility-scale solar projects.
- > The Western Cape and Eastern Cape are South Africa's key hubs for utility-scale wind projects.
- > Energy-efficiency opportunities exist in areas of high demand, e.g. in the large metros, in areas with large manufacturing concentration and in the mining areas.
- > Large and densely populated metropolitan areas including Johannesburg, Pretoria, Durban and Cape Town are primed for clean transport solutions.

Renewable energy power plants

KEY:

- Orange dot: Solar photovoltaic
- Blue dot: Onshore wind
- Green dot: Concentrated solar thermal (CSP)
- Red dot: Landfill gas
- Pink dot: Hydropower
- Grey dot: Biomass
- Purple dot: Small hydro



The largest rooftop Solar PV system of its kind in the Southern Hemisphere, able to produce 7 800MWh annually, was launched in 2018 at the Mall of Africa in Gauteng.

The Redstone solar thermal power tower in the Northern Cape is set to become the second highest concrete building in South Africa.

What support exists?

- As a signatory to the Paris Agreement, South Africa is committed to reducing its carbon emissions and its reliance on fossil fuels. In order to achieve this commitment, the government is working towards improving the environment for Clean Energy investments.
- The renewable energy sector received renewed support with the approval of the Integrated Resource Plan (IRP) in 2019 which focuses on promoting a more diversified energy mix by 2030.



REIPPPP

Competitive bidding process used by the national government to procure renewable generation capacity. New renewable energy generation capacity of 17 470MW as set out in the updated IRP 2019 is to be commissioned between 2025 and 2030.



Finance Mechanisms

- Commercial banks and development finance institutions have provided finance for REIPPPP projects.
- Property Assessed Clean Energy (PACE) model is being piloted and aims to enable low-cost, long-term funding for energy efficiency and renewable energy projects.



Treasury Guarantees

Power-purchase agreements between Eskom and IPPs are guaranteed by the National Treasury.



Special Economic Zones

Local content manufacturing at special economic zones (SEZs):

- Atlantis SEZ
- East London SEZ
- Coega SEZ.

What are the opportunities?

- In line with the national commitment to transition to a low carbon economy, South Africa plans to commission an additional 17 470MW generation capacity from renewable energy sources by 2030.

Investment opportunities include:

- **Roll-out** of **renewable energy technologies**
- **Adoption** of **energy efficiency technologies**
- **Solar energy technologies** and **components manufacturing** (solar panels, solar water geysers, timers, etc)
- **Wind turbines** and **components manufacturing**
- **Pyrolysis/gasification; anaerobic digestion**
- **Energy storage**

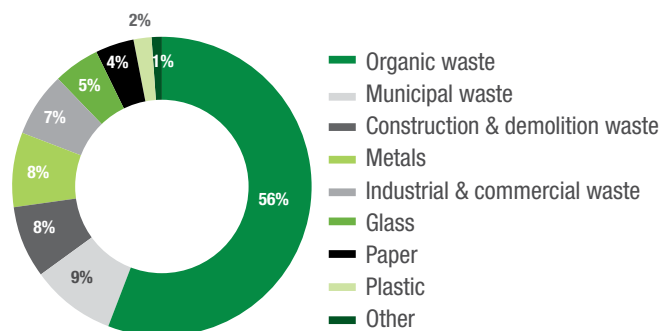
South Africa's Waste Economy

- > South Africa's waste economy contributes R24.3bn (1%) to the country's GDP and provides about 36 000 formal and 80 000 informal jobs.
- > In 2016, South Africa generated 111 million tonnes of waste, of which approximately 75% was landfilled and only 25% reused or recycled. There are more than 1 000 licensed landfills in the country.
- > General waste accounts for approximately 55% of all waste generated, followed by unclassified waste (44%) and hazardous waste (1%).
- > South Africa has relatively low levels of recycling. General waste was the most recycled type of waste with close to 40% being recycled, while less than 1% of hazardous waste was recycled in 2017.

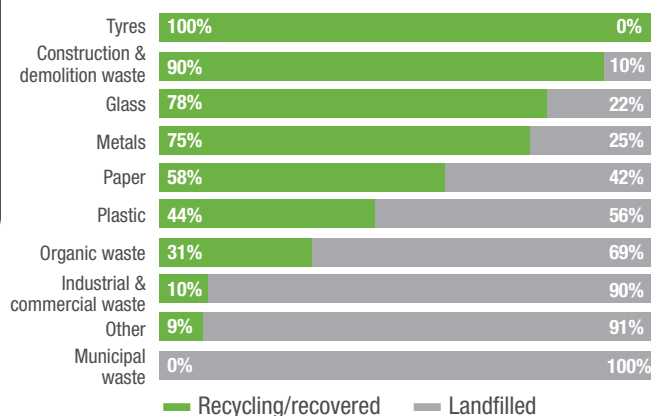
>1 000 licensed landfills

R24.3bn of South Africa's economy

Contribution to general waste, 2017



Recycling vs landfilled general waste, 2017



Why invest?

Constant waste stream

In 2017, the South African PET industry achieved a post-consumer recycling rate of 65%, exceeding the industry target of 58% and outperforming regions such as Europe which reached a rate of 59.8%. The 3% year-on-year increase in tonnage reflects the commitment of the PET industry to recycling.

2.15bn



PET plastic bottles recycled in 2017

44m tonnes of fly ash per year

Massive feedstock of e-waste

The size of South Africa's consumer electronics market is over US\$10bn. In 2015, 80% of the 7 500 tonnes of electronic plastic recovered was exported, presenting potentially a massive feedstock for e-waste recyclers.

#1

consumer electronics market in Africa



Recycling opportunities

With only 25% reused or recycled, but 65% of South Africa's waste being recyclable, recycling presents untapped opportunities.



65% of waste recyclable

Alternative to virgin material

Given that the bulk of fly ash and a sizeable amount of paper, metal, glass and plastic waste is not recycled, the use of this type of waste provides an alternative to virgin material for a range of industries.

Innovative solutions

South African companies, such as waste-to-protein company AgriProtein, have developed innovative and sustainable solutions for waste treatment, that address some of the country's most pressing environmental challenges.



#1 up-cycler of organic substrate to protein in the world

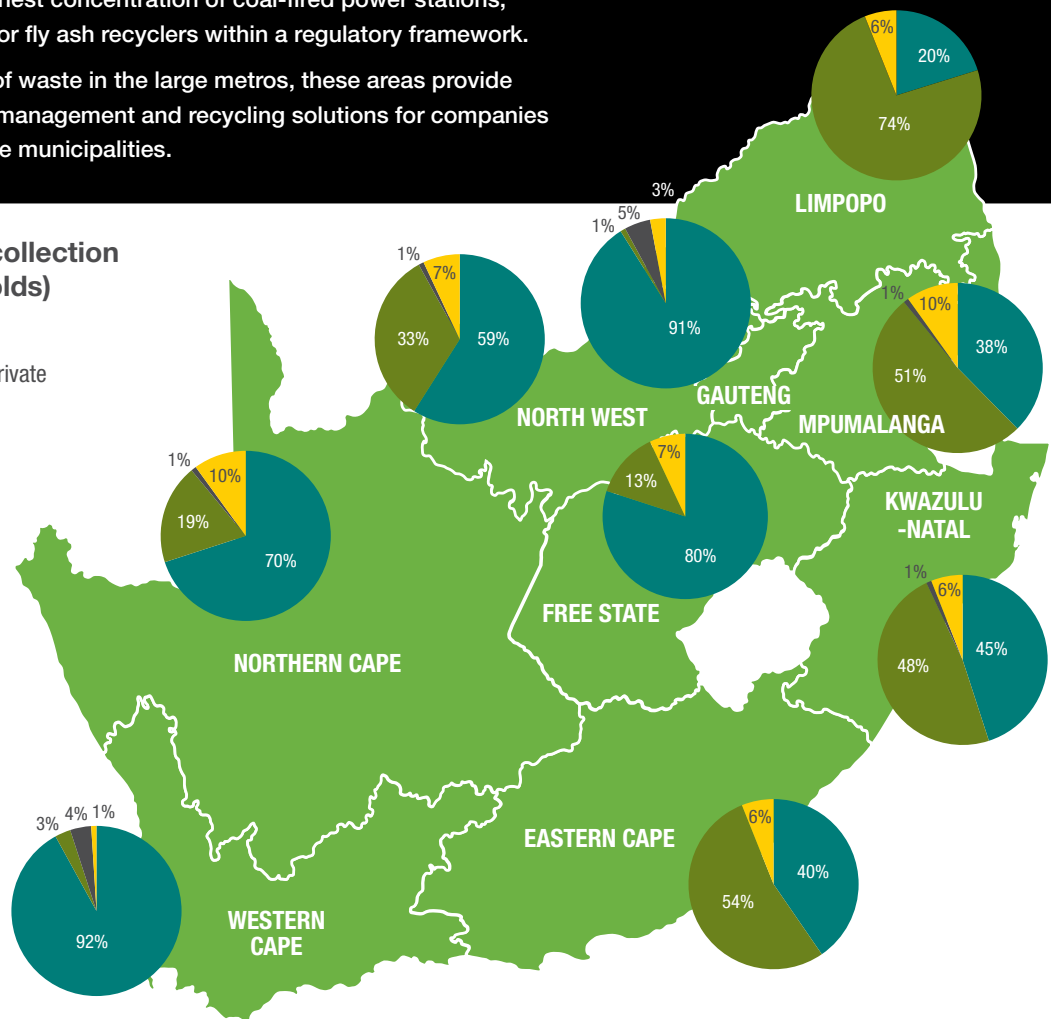
Where to invest?

- > The provinces of Limpopo, Mpumalanga, KwaZulu-Natal, North West and Eastern Cape depend on communal or individual refuse dumps, providing opportunities for formalisation of refuse collection and recycling, especially of industrial waste, which tends to be homogenous and is easier to access.
- > Mpumalanga has the highest concentration of coal-fired power stations, providing opportunities for fly ash recyclers within a regulatory framework.
- > Given the high volumes of waste in the large metros, these areas provide opportunities for landfill management and recycling solutions for companies that are contracted by the municipalities.

Breakdown of waste collection service (% of households)

KEY:

- Removed by local authority/private company
- Communal/own refuse dump
- Communal container/central collection point
- Other



A 'World First' in 2018: Researchers at the University of Cape Town turned human urine into building bricks.

What support exists?

- South Africa aims to provide an enabling operating environment for the Waste Economy. A number of programmes and plans have been launched or are under development by the government and industry players to enhance and support the sector.



Industry Initiatives

PETCO: Incentives or subsidies for PET recyclers

POLYCO: Investments in the form of infrastructure that is necessary to grow the collection, recycling, recovery or beneficiation of polyolefin plastics.



Operation Phakisa

Through Operation Phakisa engagements, the Department of Environmental Affairs (DEA) has identified 20 initiatives across four work streams to divert 20 million tonnes of waste from landfills. If implemented, this could unlock an additional R11.5bn per annum and create 45 000 direct jobs in the Waste Economy.



Legislation and Regulation

New and changing legislation and regulations will unlock a number of key waste streams, notably organics. These changes aim to simplify rules and procedures for alternative waste treatment technologies and activities.



Industry Waste Management Plans

Paper and packaging, e-waste and lighting industries will be legally required to ensure extended producer responsibility. This will improve access to feedstock and support demand for recovered materials.

What are the opportunities?

- Recent and upcoming regulatory and legislative changes are geared towards unlocking investment opportunities in the sector.

Investment opportunities include:

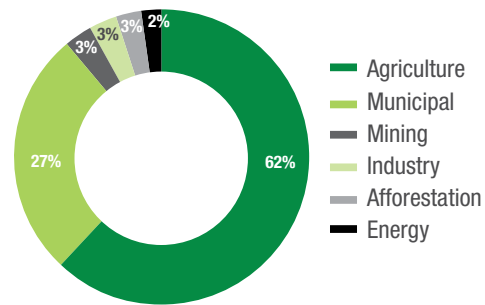
- Development of **solutions** for green waste, abattoir waste, the organic fraction of solid waste
- **Processing/recycling** of **e-waste**
- **Thermal treatment technologies** for dirty mixed plastics, refuse derived fuels and thermoform PET
- Waste related **infrastructure development, expansion** and **maintenance**
- **Pyrolysis/gasification; anaerobic digestion**
- **Recycling** (plastics, paper, glass, e-waste, etc)



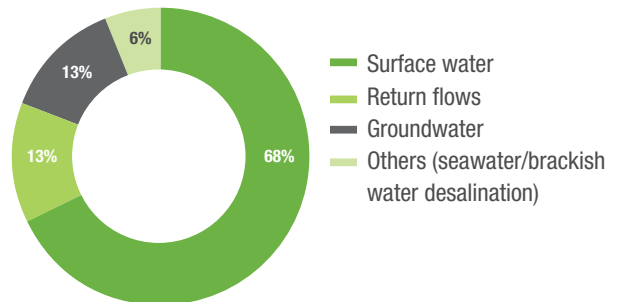
South Africa's Water and Sanitation Sector

- > As South Africa is a water-scarce country and is ranked as the 30th driest country in the world, it requires innovative solutions for water management.
- > About half of the runoff in South Africa's river systems originates from 8% of South Africa's land.
- > It is projected that water demand will outstrip supply by 17% by 2030.
- > Per capita water consumption is about 233 litres/day, compared to the international benchmark of about 180l/d.
- > The agricultural sector is the largest consumer of water, accounting for almost two-thirds of overall consumption.

Breakdown of water consumption by consumer, 2016



Water sources, 2016



Water demand will outstrip supply by

17%

by 2030

233 litres/day

per capita water consumption

Why invest?

Capital expenditure

The water and sanitation sector's capital replacement value is close to R1.4trn. The projected capital requirement for the next 10 years amounts to about R900bn.

R900bn

projected capital requirement for the next 10 years



Focus on water loss prevention

According to the Department of Water and Sanitation, water losses amount to 37% of water consumption. A 50% reduction in water loss could save up to R6bn per year. Given scarcity of supply, water loss prevention is crucial for South Africa.

A total of **1.6bn m³** of water lost annually



Underutilised return flows

Return flows from irrigation, urban domestic uses and bulk industrial and mining effluents could offer reuse opportunities of up to 1.9bn m³ per year.



1.9bn m³ of reuse opportunities annually

Demand for drought management

The recent drought conditions in various parts of the country have highlighted the need for more efficient water usage and drought management to reduce per capita consumption.



1 of 30 driest countries in the world

Alternative water supply sources

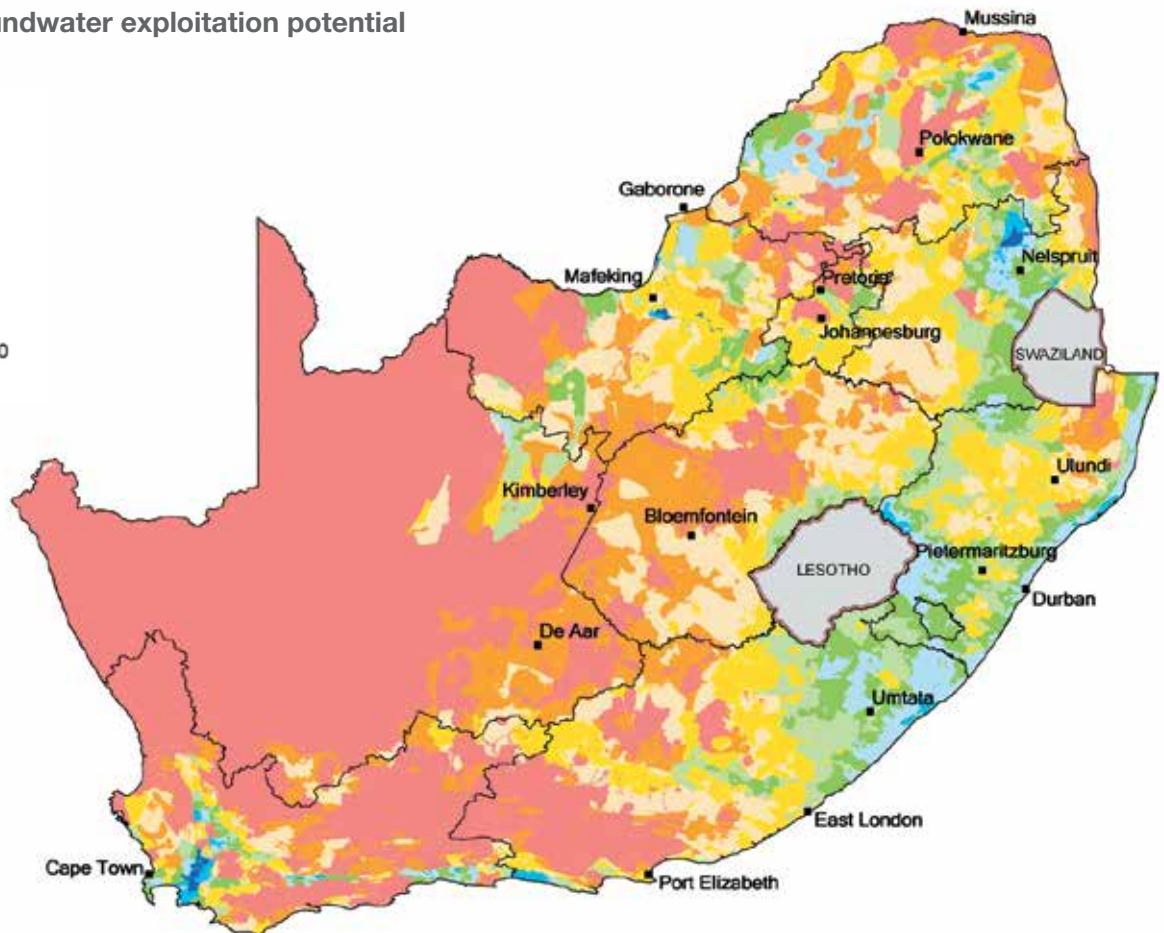
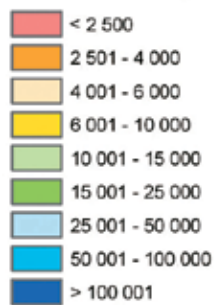
Due to the supply constraints from conventional sources, focus has shifted towards alternative water supply including seawater desalination.

4% of water supply expected from desalination by 2040

Where to invest?

- > Given the imminent water stress, South Africa has a country-wide need for alternative water sources and water efficiency technology.
- > Especially, in the Northern Cape, Western Cape, Eastern Cape and the Free State, the need for water efficiency and preservation is crucial.
- > In the coastal provinces, desalination presents a viable option for alternative water supply.

Utilisable groundwater exploitation potential
(m³/km²a)



In 2018, Cape Town was recognised by the International Water Association as the first city in the world to have cut its water consumption by 50% in just three years.

What support exists?

- > Given its scarcity of water, South Africa is committed to reducing its water consumption and to improving water efficiency. In order to achieve this commitment, the government has initiated a number of programmes in support of these key objectives.



National Water and Sanitation Master Plan

The plan provides a critical overview of the present state in the sector and the key challenges it is currently facing, together with a consolidated plan of action required to enable the achievement of the set targets.



Critical Infrastructure Programme (CIP)

The CIP is a cost-sharing incentive that is available to the approved applicant/s or infrastructure project/s upon the completion of verifiable milestones or as may be approved by the Adjudication Committee.



Funding

There are a number of funding options available for water and sanitation projects:

- SADC Water Fund
- DBSA Project Preparation Fund
- Mvula Trust.



Skills Development

A number of academies and training institutions offer industry-specific training and skills development related to water treatment, water management and water conservation.

What are the opportunities?

- > Droughts in various parts of the country have highlighted the need to invest in the water and sanitation sector.

Investment opportunities include:

- Supply and manufacturing of **advanced water technologies**
- Supply and manufacturing of **water-efficient devices**
- Supply of **smart water metering systems**
- Provision of technologies and services for **water reuse** in the **industrial sector**
- Supply of **alternative water supply technology**
- **Water efficiency technology** for the **agricultural industry**

How to invest?

Opportunity identification

- 1 Conduct feasibility study
- 2 Evaluate outcome of feasibility study
- 3 Take investment decision
- 4 Decide on investment strategy in order to best align to the market opportunity

Go ahead



Location identification



Resourcing requirements (HR, capital, finance, IT)



Compliance and legal affairs

Investment preparation

- ✓ • Decide on geographic location most suitable for investment
- ✓ • Consult property specialists, real estate agents to identify suitable offices for operations
- ✓ • Conduct site visits of suitable locations
- Consult with HR/recruitment agencies about staff requirements
- Determine immigration requirements
- Determine funding model (e.g. self-funding, debt, equity)
- Consult with IT systems providers
- ✓ • Determine corporate structure
- Determine licensing and permit requirements
- Consult with labour lawyers
- ✓ • Consult with InvestSA to identify eligibility for incentives, skills and other support initiatives

Investment execution

- Acquire/lease site, rent office space
- Apply for municipal services (e.g. water, electricity)
- ✓ • Conduct interviews, hire staff
- Apply for work permits for expatriate staff
- Open a bank account
- Apply for finance
- Set-up IT infrastructure/systems
- ✓ • Register company
- ✓ • Apply for licenses and permits
- ✓ • Apply for National Level Incentives Schemes, Skills and Other Support Programmes

✓ InvestSA ready to assist



Key contacts for more information

InvestSA

☎ +27 861 843 384

@ Investsa@thedti.gov.za

🌐 <http://www.investsa.gov.za/>

the dti

@ contactus@thedti.gov.za

🌐 <http://www.thedti.gov.za/>

Annelize van der Merwe

Director: Green Economy Investment South Africa

Department of Trade & Industry

☎ +27 (0)12 394 5721

@ avdmerwe@thedti.gov.za

Cobs Pillay

Deputy Director: Green Economy Investment South Africa

Department of Trade & Industry

☎ +27 (0)12 394 1177

@ cpillay@thedti.gov.za

Information sources

Department of Energy, 2018; Department of Environmental Affairs, 2018; Department of Water and Sanitation, 2017 & 2018; Energy Intelligence, 2016; Eskom, 2019; GreenCape, 2017 & 2018; IRP, 2019; National Cleaner Production Centre, 2017; Statistics South Africa, 2018; Who Owns Whom, 2017 & 2019; WWF, 2016.

Research partner | **Deloitte.**



the dti

Department:
Trade and Industry
REPUBLIC OF SOUTH AFRICA

investSA