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

Investing in South Africa’s Green Economy Sector

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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

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

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

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

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.

Up to 434TWh per year supply gap in 2050

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.

30%

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:**
- Solar photovoltaic
- Onshore wind
- Concentrated solar thermal (CSP)
- Landfill gas
- Hydropower
- Biomass
- 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
Recycling opportunities
With only 25% reused or recycled, but 65% of South Africa’s waste being recyclable, recycling presents untapped opportunities.

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.

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.

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.

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.

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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.

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<td>PETCO: Incentives or subsidies for PET recyclers</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
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<td>POLYCO: Investments in the form of infrastructure that is necessary to grow the collection, recycling, recovery or beneficiation of polyolefin plastics.</td>
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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)
Underutilised 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.

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.

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.

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.

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

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.

A total of 1.6bn m³ of water lost annually

1.9bn m³ of reuse opportunities annually

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.

Water demand will outstrip supply by 17% by 2030.

233 litres/day per capita water consumption

Breakdown of water consumption by consumer, 2016

Water sources, 2016

Agriculture
Municipal
Mining
Industry
Afforestation
Energy
Surface water
Return flows
Groundwater
Others (seawater/brackish water desalination)

4% of water supply expected from desalination by 2040

1 of 30 driest countries in the world

27%
62%
13%
13%
6%
3%
2%

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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.

Where to invest?

**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.

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.

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

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

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

Resourcing requirements (HR, capital, finance, IT)

Compliance and legal affairs

InvestSA ready to assist
Key contacts for more information

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**Information sources**