HIGH POTENTIAL OPPORTUNITY
WASTE TO ENERGY IN SOUTH
AFRICA

ENERGY FOR AFRICA

BUSINESS SWEDEN, 2017
Sweden has a long and successful history in waste management and specifically with waste to energy solutions.

The opportunities provided by the waste sector are being driven by, amongst others, issues of carbon economics, resource scarcity, commodity prices, globalisation, climate change and tightening regulation.

There are opportunities for Swedish companies across the value chain ranging from collection, sorting, processing and treatment of waste, including specifically waste to energy opportunities.

This document will outline how Swedish companies can benefit from the opportunities in the expanded waste management sector. This document will focus on the current waste landscape in South Africa taking into account the legislative, investment, incentive and opportunities across the waste value chain, with specific focus on the waste to energy opportunities.

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WASTE TO ENERGY

The “Waste to Energy” opportunity in South Africa has been identified as one of the Energy for Africa program’s High Potential Opportunities (HPOs). The project was selected due to the changing waste management landscape in South Africa and the potential for Swedish companies to do business within this sector.

The existing waste industry in South Africa consist of the collection, landfilling and limited recycling (diversion) of waste. Household waste is typically collected and managed by local municipalities (in some cases by municipal service providers on behalf of the municipality) while commercial and industrial waste is typically collected and managed by private companies.

Most of the waste is disposed at municipal landfill sites (estimated at 90%\(^1\)) except for some commercial and industrial waste that is managed by private companies.

Policy and regulatory reforms, environmental pressure, limited landfill space and increased sustainability awareness is changing the waste landscape in South Africa. Waste management is crucial for the green economy and sustainability goals of both government and the private sector.

The South African government has identified the waste sector as a sector that can contribute towards local economic growth and job creation. The National Green Economy Accord (EDD, 2011) recognises the role that the waste sector, specifically waste reuse, recycling and recovery, can play in South Africa’s transition towards a Green Economy.

The policy framework to move waste up the waste management hierarchy away from landfilling towards waste reuse, recycling and recovery has been provided by government through the promulgation of the National Environmental Management: Waste Act (RSA, 2009).

This creates the enabling policy environment for job creation as new projects are implemented by business and industry, new markets become available, new business opportunities recognised, and as new innovations (technological and social) are introduced to the waste sector\(^2\). The waste sector is, therefore, potentially a meaningful contributor to the South African economy if it is supported and stimulated by government and the private sector.

\(^1\) “The state of innovation in the South African Waste Sector” – CSIR Paper at Solid waste world congress; ISWA 2014, Sao Paulo, Brazil, 8-10 September 2014, At Sao Paulo, Brazil

OPPORTUNITY DESCRIPTION

Waste to Energy – South Africa

South Africa, like most countries on the African continent, has very little accurate and reliable waste information, both in terms of waste quantities (tonnages) as well as organisational information. However, the estimated financial value of the formal South African waste sector (both public and private) in 2012 was estimated as R15.3 billion, or 0.51% of South Africa’s gross domestic product (GDP). According to the National Waste Information Baseline (NWIB), South Africa generated approximately 108 million tonnes of waste in 2011, consisting of 59 million tonnes of general waste; 48 million tonnes of unclassified waste; and 1 million tonnes of hazardous waste. It is estimated that around 38 million tonnes (65%) of the classified waste is classified as recyclable, and therefore could theoretically be diverted from landfill and recovered to be reprocessed/repurposed.

South Africa’s waste management opportunities are predominantly focussed on recycling, recovery (energy) and treatment and disposal. Given Sweden’s strong position in the waste recovery (waste to energy) space, the opportunity will be limited to this sub-sector of waste management only. Existing projects undertaken in waste to energy includes private small to medium scale projects where energy (electricity, heat, gas and fuels) is created for own use or sold to other private buyers. Another opportunity is the Department of Energy’s (DoE) Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), which has allocated 145 MW for large-scale biogas, biomass and landfill gas projects. Of the 145 MW, 59 MW has already been allocated (Rounds 1-4) while the remaining potential is 86 MW (7 MW – landfill gas, 19 MW - biomass and 60 MW biogas respectively).

In summary, there are two opportunities; first the small and medium-scale waste to energy projects (electricity, heat, gas and fuels) with the private sector or municipalities and secondly, the DoE REIPPPP Programme of 86 MW, including biogas, landfill gas and biomass as described above.

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1 Waste Economy – 2016 Market Intelligence Report (GreenCape)
Waste to Energy – South Africa

The growth potential in the small and medium-scale waste to energy facilities are the first area where Swedish companies and solutions could benefit. Typical projects include biogas plants where the energy (electricity, heat and/or gas) is used for own use or where electricity is wheeled through the existing electrical grid to other nearby private buyers.

One example of this wheeling type of arrangement is a 4.4 MW biogas plant, situated near Tshwane (Pretoria), that supply electricity to carmaker, BMW’s Rosslyn factory in South Africa. This biogas facility uses a mixture of cow manure from a 30 000 cattle feedlot and organic waste ranging from paper sludge, fruit and vegetable leftovers, fat from restaurants, abattoir waste, yogurt, dog food and expired carbonated drinks, supplying approximately 25 to 30 percent of the electricity consumption at BMW’s factory. While BMW is purchasing power generated at the biogas plant, the energy is fed into the local grid owned and operated by Eskom, the state power utility, which then connects to the auto plant via the city of Tshwane’s electricity distribution network. Tshwane, the local metropolitan area where both factories are located, facilitate the billing process.

An example of waste to energy for own use, is the City of Johannesburg’s Northern Water Works project, which treats about 430-million litres of sewage a day. This waste water treatment works (WWTW) site was the first biogas to energy project in Johannesburg and was developed within the existing WWTW site. The facility produces 4.5 MW of electricity for own use from biogas using cogeneration (or combined heat and power, CHP) gas engines. The electricity produced reduces Johannesburg City’s need to purchase more expensive power from Eskom and soften the impact of rising electricity prices. The heat produced will also improve sludge management and increase biogas production while it showcases the City’s commitment to renewable energy.

Many of the existing WWTW plants in the larger cities in South Africa have installed biogas plants, built in the early 1970s, which are currently idle due to poor maintenance and the inadequate training of WWTW staff. There is an opportunity for Swedish companies to participate in the refurbishment of these WWTW plants and providing solutions to generate electricity or gas from these plants. The South African Local Government Association (SALGA) and the DoE are currently discussing the feasibility of this energy-efficiency intervention as part of the future energy solution for South Africa.

OOPORTUNITY DESCRIPTION: DOE’S REIPPMP

Waste to Energy – South Africa

South Africa occupies a central position in the global debate regarding the most effective policy instruments to accelerate and sustain private investment in renewable energy. In 2009, the government began exploring feed-in tariffs (FITs) for renewable energy, but these were later rejected in favour of competitive tenders. The resulting program, now known as the Renewable Energy Independent Power Producer Procurement Program (REIPPPP), has successfully channelled substantial private sector expertise and investment into grid-connected renewable energy in South Africa at competitive prices.

Since November 2011, more than 6 327 MW from 92 renewable energy projects have been awarded at increasingly lower and cost competitive rates. The REIPPPP has attracted investments of R 192.6 billion of which R 53.2 billion was from foreign investors and financiers. The renewable technologies include onshore wind, solar PV, solar CSP, landfill gas, biomass and small hydro and 37 projects are operational, with 1827 MW of on-line capacity.

Swedish companies could benefit from the remaining waste to energy allocations of 86 MW (7 MW – landfill gas, 19 MW - biomass and 60 MW biogas respectively). The IPP participation is typically via a tender and bid process which includes Request for Proposals, bidders conferences, power purchase agreements (PPAs with Eskom), DoE guarantees (effectively provided a sovereign guarantee of payment) and subject to special requirements as per the process. Bids are typically required to contain information on the project structure, legal qualifications, land, environmental, financial, technical and economic development qualifications and bidders need to submit bank letters indicating that financing is locked-in. Bidders are also expected to identify the sites and pay for early development costs at their own risk. Project selection is based on a 70/30 split between price and economic development considerations.

Another opportunity for Swedish companies is that the REIPPPP has been extended to offer opportunities for small-scale renewable energy (RE) producers to participate. The small projects procurement approach is designed to promote partnerships between large experienced developers and smaller local entities to facilitate skills transfer and risk sharing. Under the small REIPPPP programme, projects with the capacity to deliver between 1 and 5 MW of generation are considered to contribute a total of 200 MW. The RE energy included under the small REIPPPP programme will be derived from onshore wind, biomass, biogas, landfill gas and small hydro technologies. As at 31 March 2015, 29 bids have been received totalling 140 MW and procurement of the first 50 MW under this programme is in process.

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6 South Africa’s Renewable Energy IPP Procurement Program: Success Factors and Lessons - Anton Eberhard, University of Cape Town may 2014
Electricity generation is dominated by state-owned power company Eskom, which currently produces over 96% of the power used in the country. Eskom has a nominal installed capacity of more than 45 GW and is part of the Southern African Power Pool, a group of utilities in the region aiming to create a common market for electricity in the region. It is estimated that South Africa needs over 85 GW of generation by 2050.

Currently, the transmission of electricity in South Africa is undertaken by Eskom and the company has over 28,000km of transmission lines spanning the entire country. Electricity distribution is the final stage in the delivery of electricity to end users, currently undertaken by Eskom, together with 187 municipalities.

The South African Government is committed to diversifying its energy mix and this includes the introduction of renewable energy at a large scale. Renewable energy is growing fast and will be a large part of the future energy mix. The DoE is currently modelling and simulating a number of scenarios which will be used to inform the energy policy.

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8 DOE’s INTEGRATED RESOURCE PLAN – 2016
Team Sweden

The Energy for Africa program was launched to support Business Sweden’s efforts to achieve its mandate because of Sweden’s strong industry strength in the energy sector. Sweden is a world leader in sustainable and renewable energy and has an almost carbon-free energy supply. Other areas of expertise include energy efficiency, smart grids, energy related policy and regulations, legal frameworks and market design, generation, transmission, distribution, and many other abilities including leading research and development institutions.

In order to win bids in a competitive environment in Sub-Saharan Africa, and specifically in South Africa, it is important to utilise the strengths of Team Sweden. Team Sweden consists of two parts: the official Swedish institutions as shown below as well as the Swedish companies offering their goods and services.

Team Sweden

![Team Sweden Logos]
FINANCING
FUNDING AND INCENTIVES

There is a range of funding solutions, either focused on, or available to greentech manufacturers and service companies, as well as those who use such services. These cover Development Finance Institutions, local public and private sector financers and investors, and a considerable range of tax incentives. According to the KPMG Green Tax Index, South Africa ranks 13th out of 21 countries to use tax as an incentive to drive the green growth agenda (ahead of Australia, Singapore and Finland). As well as understanding the various incentives and funding options available to them, investors and suppliers of greentech can also benefit from understanding those available to their customers or clients, as these can influence the viability and attractiveness of their products and projects.

The following Manufacturing incentives are available:

- Department of Trade and Industry (DTI) special economic zone (SEZ) programme aims to increase industrialisation, economic development and job creation around the country. More specifically, the proposed Upington Solar Corridor SEZ (Northern Cape) and Atlantis Greentech SEZ (Western Cape) focus on solar energy generation and greentech manufacturing respectively. They provide significant incentives to manufacturers, IPPs, and other players in the relevant value chains.

The following Development Finance solutions are available:

- International Finance Corporation (IFC) - Loan, Equity www.ifc.org
- European Investment Bank (EIB) – Loan Greater than R0.25 million
- SouthSouthNorth / DBSA: Sustainable Settlements Facility (SSF) - Grant, Subsidy, Rebate
- African Development Bank: Sustainable Energy Fund for Africa - Grant, Technical assistance, Equity Grant for projects with total capital investments in the range of USD 30-200m. Equity for IPPs with an ideal size of between 5 and 50 MW and a commitment per project of between USD 10-30m.
- United Nations Development Programme (UNDP): Global Environmental Facility (GEF) – Grant Up to USD 50 000
- UK Prosperity Fund Programme – Grant, www.gov.uk/guidance/prosperity-fund-programme
- German Federal Ministry of Environment: International Climate Initiative (IKI) – Grant
- German International Cooperation Agency (GIZ) - Feasibility studies Bioenergy
FINANCING

FUNDING AND INCENTIVES

The following Public Sector Funding solutions are available:

- Western Cape Government: Cape Capital Fund – Grant 50% of approved intervention
- Industrial Development Corporation: Green Energy Efficiency Fund - Loan, Technical support R 1-50 m
- Development Bank of South Africa: Green Fund - Grant, Loan
- Green Cities and Towns; Low Carbon Economy; Environmental & Natural Resource Management.
- dti: Critical Infrastructure Programme (CIP) – Grant, 10% to 30% of the total qualifying infrastructural development costs, up to a maximum of R50 million
- dti: MCEP - industrial financing – Loan, Pre-and post-dispatch working capital facility of up to R50m at a fixed interest rate of 4% over a four-year term
- dti: MCEP - production incentive – Grant, Up to 25% of the manufacturing value added
- dti: Manufacturing Investment Programme (MIP) – Grant, Investment grant of 30% of the investment cost of qualifying assets for new or expansion projects below R5 million. Investment grant of between 15% to 30% of the investment cost of qualifying assets for new or expansion projects above R5 million.
- Department of Small Business Development (DSBD: Co-operative incentive scheme (CIS) – Grant, R0.35 million
- Municipal Infrastructure Grant (MIG) – Grant, www.westerncape.gov.za/general-publication/municipal-infrastructure-grant

South African National Biodiversity Institute: Global Adaptation
Business Sweden's purpose is to help every Swedish company to reach its full international potential and help companies abroad to reach their potential by investing in Sweden. The purpose is operationalised through 450 staff deployed at 14 offices in Sweden and at 55 offices in 49 key markets abroad. Feel free to contact us for any questions regarding Swedish international trade or foreign investments in Sweden.