GIZ/SALGA RE Support to Municipalities
Overview on Pilot RE Projects

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Cooperation with

Objectives, Operation, Activities
Background information on GIZ

- As a government-owned corporation, GIZ carries out sustainable development projects worldwide for the German Federal Government and other public and private-sector clients.
- The organisation supports political, economic, ecological and social development worldwide.
- GIZ operates in more than 130 countries and employs more than 17,000 staff members (with a 70–30% split between national and international personnel).
- In 2010, GIZ’s turnover was EUR 1.85 billion.
- GIZ commenced activities in South Africa in 1994 and since then, allocated 550 million euro to the bilateral cooperation with South Africa.
- GIZ South Africa employs around 250 staff members of which 60% is South African.
- The main focus of our work in South Africa is on Governance and Administration, HIV/AIDS, Energy and Climate.
SAGEN: Programme principles, objective and duration

**Important principles**

- SAGEN focuses on large scale, grid-connected renewable energy projects
- Energy efficiency projects are focussed on supporting national EE incentive programmes and initiatives
- Ownership of partner institutions
- Seeking synergies with other initiatives
- Efficiency and Quality

**Programme Objective:**
Investments in RE and EE have increased

**Budget and Duration**

- Planned until 2020
- Phase 1 from October 2011 to September 2014
- Budget for phase 1: 12 million euro
In cooperation with South African – German Energy Programme (SAGEN)

**Component 1: Renewable Energy**
Objective: The conditions for investments in RE have improved

- **Sub-Component 1.1**: Institutional and regulatory capacities for promotion of RE
- **Sub-Component 1.2**: Support to grid and system integration of RE
- **Sub-Component 1.3**: Technical expertise for wind and solar

**Component 2: Energy Efficiency**
Objective: The conditions for investments in EE have improved

- **Sub-Component 2.1**: Institutional capacity development for EE promotion
- **Sub-Component 2.2**: Implementation of innovative EE programmes
- **Sub-Component 2.3**: Development of a market for energy service provides
- **Sub-Component 2.4**: Technology dissemination and private sector cooperation
GIZ/SALGA RE-Activities

**RE technology support**

- Waste to energy
- Solar PV
- All RE technologies

**RE financial aspects**

- Calculation of the levelled cost of electricity for eThekwini Municipality,
- Further analysis of the rooftop –PV dissemination
- Cost of Electricity Supply Study with a possible development of the Green Tariff for the NMBMM

**Technical aspects of grid integration**

- Baseline on the existing grid integration requirements for the municipalities
- Tariff Study on possible net-metering options
- Safety standards of RE integration
- RE integration and impacts on the municipal grid
RE:
Overview on the existing projects and forms of municipal engagements
Overview: Existing and Planned RE-Projects

- **Solar PV**
- **WtE**
- **Wind**
- **Mixture**

**City of Johannesburg**
- WtE Sewage Operational
- WtE Landfill (in progress)

**City of Tshwane**
- WtE (agricultural waste) (in progress)

**Ekurhuleni**
- Solar PV Operational

**NMBM**
- Wind Energy Operational
- WtE Landfill (in progress)

**Drakenstein**
- WtE Landfill (in progress)

**Mogale City**
- WtE Landfill (in progress)

**Buffalo City**
- WtE Landfill (in progress)

**City of Cape Town**
- Wind Energy Operational

**eThekwini**
- Co-generation (bagasse-based) Operational
- Solar PV - commercial + residential (Research based)

**uMlalazi**
- WtE (landfill) Operational

**City of Cape Town**
- Wind Energy Operational

**City of Tshwane**
- WtE (agricultural waste) (in progress)

**Mogale City**
- WtE Landfill (in progress)

**Buffalo City**
- WtE Landfill (in progress)

**NMBM**
- Wind Energy Operational

**City of Cape Town**
- Solar PV - residential (Research based)
Options for Public Private Partnership (PPP)

Foundation
Commitment, data, strategy, institutional capacity + determination (ERA, section 34)

- Supply and Civil Works Contracts
- Technical assistance contract
- Sub-contracting
- Management contracts
- Leasing
- BOT Concession
- BOO

Duration of Contracts

Private Sector Commitment
BOO – Build Own Operate

- A private company is granted the **right to develop, finance, design, build, own, operate and maintain** a project.
- The public-sector partner **may provide limited funding** but the private-sector partner assumes the risks associated with planning, constructing, operating and maintaining the project for a specified time period.
- The private company retains ownership of the facility.
- At the end of the specified period, the private-sector partner **may transfer ownership to the funding organization**, either freely or for an amount stipulated in the original contract. (Build Own Operate Transfer)
Example 1: RE PPP – Build-Own-Operate Contract

- City of Johannesburg
  WtE (Biogas to Electricity)
  1.1 MW - Own Use
  PPP - O&M

- eThekwini
  WtE (Landfill gas to Electricity)
  8 MW - Grid Connected
  PPP - O&M
Example 1: RE Maintenance Contract

City of Johannesburg: Waste to Energy Project (Biogas to Electricity)

- Location: Johannesburg Water’s Northern Works Waste Water Treatment near Diepsloot
- Operational since Nov 2012
- Upgrading sludge digestion facilities (by-product biogas)
- Product of sewage treatment
- Aim: to reduce the electricity consumption by replacing the Eskom supplied electricity
- Power plant is capable of producing 1.1 MW of power for the treatment plant, which is 18% of its power requirements.
- Plans to ramp up the project to 4 MW, which would be 65% of the site’s power requirement, and the plant was designed to suit the upgrade.
- O&M signed for 7 years
Options for Public Private Partnership (PPP)

Foundation
Commitment, data, strategy, institutional capacity + determination (ERA, section 34)

- Supply and Civil Works Contracts
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- Management contracts
- Leasing
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- BOO

Private Sector Commitment
Duration of Contracts
BOT – Build Operate Transfer

- A private company is granted the right to build and operate a facility for a period of time
- The transfer of the ownership to the public sector takes place afterwards
Example 2: RE PPP BOT Contracts

Drakenstein
WtE (landfill gas to electricity)
Capacity not yet defined, on-grid
PPP - BOT, Feasibility Stage

City of Johannesburg
WtE (landfill gas to electricity)
Capacity not yet defined, on-grid
PPP - BOT - Feasibility Stage

Mogale City
WtE (solid waste gasification)
8 MW (Final 72) on-grid
PPP - BOT - Feasibility Stage (EIA)

City of Cape Town
WtE PPP - BOT
PLANNED

Buffalo City
WtE (solid waste gasification)
PPP - BOT
PLANNED

In cooperation with
Example 2: RE PPP BOT Contracts

- Total 32 of registered projects (3 RE-projects)
- Standardized PPP provisions and PPP manual
- Growing interest by municipalities and private sector to engage in PPP
Perceptions about PPP

**PRO**

- Service can often be delivered **more efficient and cheaper by IPP**
- **Less financial/technical risks** for municipalities
- Projects seem to be bankable using Eskom-rates (Megaflex)
- **Support by NT** “along the entire way”

**CON**

- **Onerous and costly process** (minimum of 2 years)
- Lack of awareness (process and eligible technologies)
- **On-grid feed-in specifications not clear**
- Credit risk
- Provisions of loans difficult

*PPP Models*
Options for Power Purchase Agreement (PPA)

- Voluntary Market
  (PPA between willing Buyer/Willing Seller)

- Contract between municipality and EG

Foundation
Commitment, data, strategy, institutional capacity + determination (ERA, section 34)
Example 3: PPA Contracts between willing buyer and willing seller

- Bronkhorstspruit Voluntary Market Bronkhorstspruit Biogas Project 3 MW On-Grid
- City of Cape Town Voluntary Market Darling Wind Farm 4.8 MW On-Grid
- uMhlathuze Voluntary Market Landfill Gas Project 0.4 MW On-Grid
- NMBM Municipal Voluntary Market Scheme (Amatola Green Power (Pty) LTD) 10% RE-Cap (65 MW) On-Grid
Example 3: PPA between willing buyer + willing seller

Bronkhorspruit Biogas project BBP

- Location: premises of the Beefcor at Bronkhorstspruit
- 10 year PPA between generator (Bio2Watt) and user (BMW)
- 3 MW biogas to electricity plant (60,000 tons of biowaste per annum)
- Electricity to be sold at ZAR 0.96/kWh
- Wheeling agreements with Eskom and Tshwane Municipality (40 km distance)
Perception about PPA

Voluntary Market Models

**PRO**

- Existing (and certified) traders
- Existing wheeling agreements
- Market driven/demand-based (willing buyer willing seller)

**CON**

- Market restricted by “willing buyers”
- Municipality “only” benefits from wheeling charges
Options for Power Purchase Agreement (PPA)

Voluntary Market
(PPA between willing Buyer/Willing Seller)

Contract between municipality and embedded generator

Foundation
Commitment, data, strategy, institutional capacity + determination (ERA, section 34)
Example 4: PPA Contracts between municipality and embedded generator
Example 4: PPA between Municipality and EG

eThekwini – guidelines and forms

• eThekwini first municipality in SA to establish a formal application process for grid-tied energy generation

• Currently 6 EPGs have followed procedure and are in operation
Example 4: PPA between Municipality and EG

Co-generation eThekwini

• NCP Alcohols (Co-generation)
• **2.8 MW** of electricity is generated, of which 2.4 MW is used up on site with 0.4 MW being sold back to the grid
• NCP has signed a PPA with eThekwini (3 years)
• Eskom Megaflex rates used (capital cost low)
Perception about PPA

**PRO**
- Control of **SSEG-activity** by municipality
- Existing projects and layouts

**CON**
- MFMA (Section 33)
- Expensive and time consuming tender process
- Security of investment not guaranteed
- Feed-in tariff (?)
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