

CITY OF TSHWANE WASTE WATER TREATMENT

UTILITY SERVICES DEPARTMENT

BULK WATER AND WASTEWATER SERVICES DIVISION

Kerneels Esterhuyse

September 2020



Introduce Waste to Energy

(Combined Heat Power = CHP)



Kerneels Esterhuyse September 2020

Background

ONNECTIVE



- Continuous aeration required to enable biological waste water treatment to required regulated effluent quality limits
- Electricity supply for aeration
 - Intermittent supply due to load shedding enforced by electricity public utility company (ESKOM)
 - Recently high cost hikes
- Inferior effluent quality also due to lack of continuous electricity
- Effluent of WWTW is indirectly re-used as water resource for drinking water supply

Zeekoegat WWTW







Institution

- City of Tsh introducinç
- Feasibility
 Internatior
 - Biogas to
- Buy-in fror City of Tsh
- Zeekoega roll-out to
 - Operatio



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Institutional Setting



- National Department of Mineral Resources and Energy (DMRE) provided grant funding (EEDMS and SANEDI)
 - Appointed through USAID a consultant to review and confirm the first feasibility study with new data
 - Draft specifications for CHP
 - Technical support by C40 Cities through Cities Finance Facility (CFF)
 - Appointment of a Technical Advisor to package the project
 - Appointment of a Transactional Advisor to:
 - Assess design specifications
 - Contracting options and Risks
 - Peer-to-peer learning on CHP contracting

Climate Change



- Biogas from anaerobic digesters are flared to convert methane to carbon dioxide
- Environmental Defence Fund says:
 - <u>https://www.edf.org/climate/methane-other-important-greenhouse-gas</u> (Assessed on 28 August 2020)



 Biogas usage that is produced from anaerobic digesters reduce the use of fossil fuels, mitigating global warming



CITY OF TSHWANE IGNITING EXCELLENCE

- Construction of a modular 350 kW CHP to produce onsite electricity supply
 - Infrastructure provision
- Operate & Maintain of CHP by a service provider
 - Sound Business model for Zeekoegat and possibly other WWTWs
 - Reduction of energy supply with about 15-20%
 - Skills Transfer to City of Tshwane
- Saving in CO₂ emissions by about 31000 t CO₂ e/year
 - 71% reduction from baseline



Outputs

Transfer



- Site specific Feasibility Studies required before implementation
- Planning with realistic time frame for implementation
- Networking (peer-to-peer learning)
- Funding opportunities and requirements to be determined
- Various Business Models are available
- All risks to be properly identified and mitigated



Transfer



- CFF can assist on approval to include:
 - Bankable, properly packaged business model
 - Identifying source funding
 - Developing relevant capacity in the City of Tshwane
 - Develop contract models with private sector (PPP)
 - Development of specifications and tender documents
 - Energy Efficiency management



Thank you



