

WASTE TO ENERGY FOR THE DISPOSAL OF MUNICIPAL SOLID WASTE IN STELLENBOSCH: IS IT FEASIBLE?

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Waste to Energy is not:

1. Specifically Electricity from Waste
2. A Black Box one stop solution to waste problems
3. Cheap
4. Easy
5. Without Consequence

INTEGRATED WASTE MANAGEMENT (STELLENBOSCH DRAFT IWMP APRIL 2015)

GreenCape are currently busy with the updating of the waste management strategy for municipality through the IWMP process and have inter alia investigated the following scenarios for waste planning to address the issues that the municipality have:

SCENARIO 1

In scenario 1, builders rubble is diverted to a brick making factory and garden refuse to a composting facility, with the bulk of the remaining waste being landfilled at Devon Valley. Once Devon Valley reaches capacity, the waste will need to be sent to another landfill site, possible Kalbaskraal, a City of Cape Town/Regional landfill site that is in the planning phase.

SCENARIO 2

The separation at source, of recyclable domestic household waste. The recyclables are then sent to the Materials Recovery Facility (MRF) at Kraaifontein or a new local MRF, with residual waste being landfilled at Devon Valley, and at Kalbaskraal post closure of Devon Valley

SCENARIO 3

The recyclables will follow the same route(s) described in Scenario 2 and be diverted to either the local or Kraaifontein MRF. The organic stream will be sent to a local organic treatment facility, provisionally located at Klapmuts, where it can be treated using an anaerobic digester (AD). The remainder of the waste will be sent to landfill, and when the local Devon Valley Landfill is full, the waste will need to be diverted to Kalbaskraal landfill.

SCENARIO 4

Scenario 4 represents a collaborative approach to waste disposal. This would depend on source separation, with organics treatment at a local organic treatment facility as mentioned above and would be supplemented by other municipalities (Drakenstein and City of Cape Town) organic waste streams. Recyclables would be sent to the MRF while the residual waste would be sent to Drakenstein Municipality, which is in the process of implementing a W2E project.

SCENARIO 5

In this proposal no source separation occurs and it is assumed that no further separation at source will be implemented, and a mixed waste stream will need to be processed. Separation will take place either through a non-technical route (e.g. manual sorting) or through a mechanical separator (designed to separate mixed waste to produce e.g. organic waste for AD, recyclables and RDF). Three streams (as described in Scenario 3) will be produced. The organic fraction will still be sent to a local organic treatment facility, due to the 'dirty' nature of the recyclables produced, which may be unsuitable for processing at a MRF, this stream may be used for the production of Refuse-Derived Fuel (RDF). Once again the remainder of the waste will be sent to the Devon Valley landfill.

Need for W2E

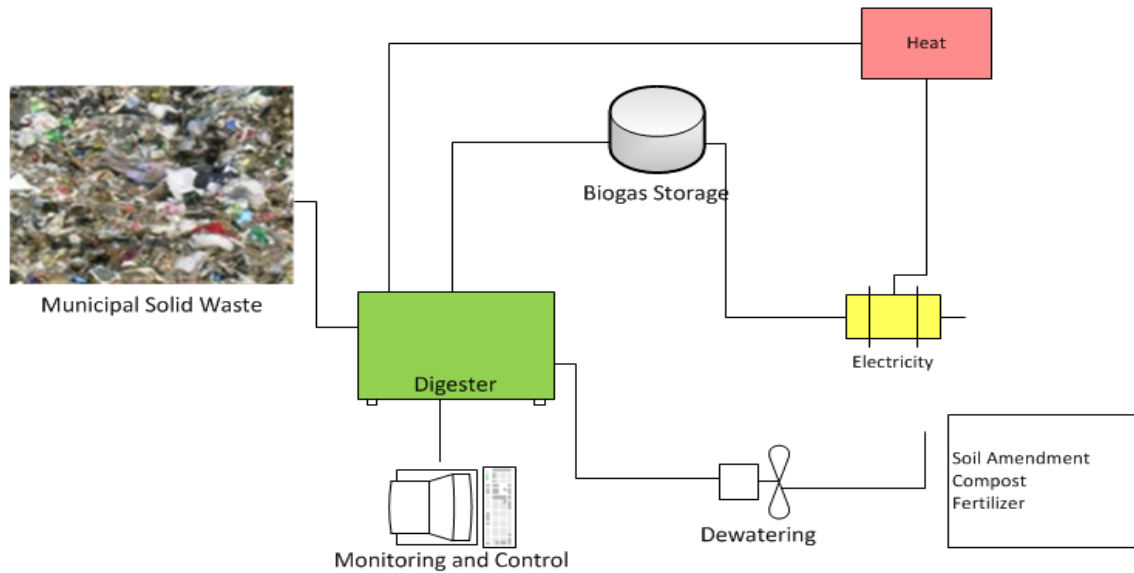
1. Stellenbosch will arguably run out of “airspace” in three years
2. There is no real possibility of regional “airspace” for 10 to 15 years
3. The neighbouring municipalities are also running out (Drakenstein, CoCT.)
4. There is an environmental cost to landfilling (e.g. Global Warming)
5. Although the old “hole in the ground” dumpsite is cheap Engineered Landfilling is not (EIA, design, construction, operation, closure)
6. South Africa’s economic growth has declined to 1.3% largely as a result of “load shedding”

Possible site for W2E

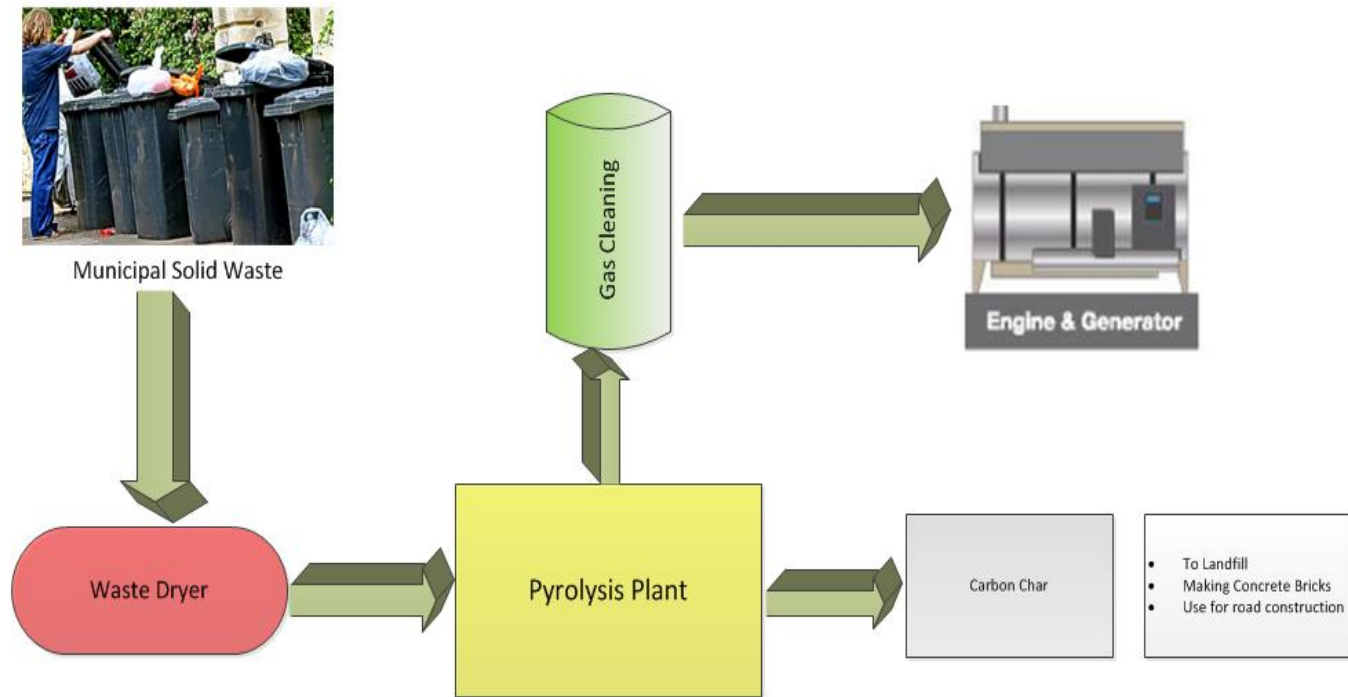


W2E Technologies

Anaerobic Digestion

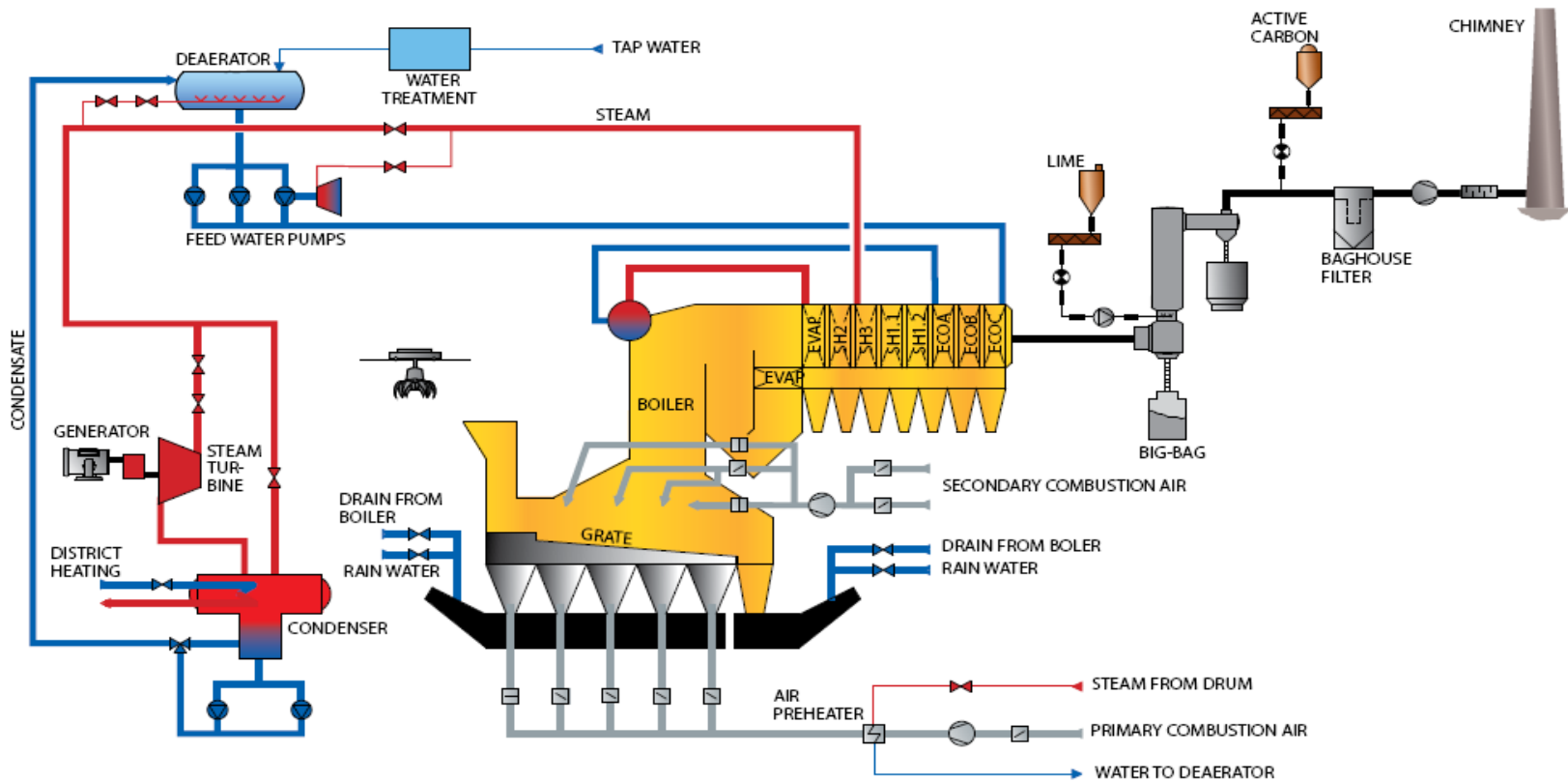


Pyrolysis and Gasification



Pyrolysis Process Diagram

Incineration



Typical concept for waste-to-energy Plant (from website of Babcock & Wilcox Vølund A/S)

Technology for Stellenbosch

1. Mass burn technology is prohibitive expensive for the application in a small municipality and cannot be justified for the amount of waste generated by Stellenbosch or in-fact by the surrounding municipalities.
2. AD in conjunction with Gasification or Pyrolysis is scalable and can be applied to smaller projects and there are currently such installations being constructed and commissioned in RSA although not specifically for MSW.
3. The main purpose of the W2E plant would be for the disposal of waste and the generation of electricity will be beneficial but not significant.

Delivery Model

There are a number of Municipal Service Partnerships that are available as external mechanisms for the provision of the Waste Facility site operation and management service to the Stellenbosch Municipality:

1. Public / Public Partnership
2. Service Contracts
3. Operating and Management Contracts
4. Lease Contracts
5. Concession
6. De-Monopolisation and new entry
7. Full Privatisation
8. Build - Operate –Own -Transfer (BOOT)
9. Employee / Management Buy-Out

Legislative Framework

If the municipality does go the route of W2E, the following legislation is applicable:

1. The Local Government: Municipal Systems Act, Act 32 of 2000
2. The Local Government: Municipal Finance Management Act, Act 56 of 2003
3. The National Environmental Management: Waste Act, Act No.59 of 2008
4. The National Environmental Management Act, Act 107 of 1998
5. The National Environmental Management: Air Quality Act 39 of 2004

Other acts and SANS standards etc. may be applicable for different technologies

OUTCOMES AND RECOMMENDATIONS

1. The municipality must make alternative arrangements for waste disposal,
2. The municipality is part of the district and can't do it "alone",
3. There is no one stop; one size fits all solution,
4. Alternative treatment is feasible but must be scaled to purpose,

W2E IS A WASTE SOLUTION FOR STELLENBOSCH NOT A ENERGY SOLUTION

Thank you for your attention.
Any questions?

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