Enhanced Landfill Mining
A case in Belgium
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Introduction
- Mine the Remo landfill site, > 140 ha, ~18 million tons
- Apply zero waste technologies creating value
- Integrate in to surrounding nature
Drivers for Group Machiels
- Economic interest
- Continue to be active on the site
- Apply technologies on other sites

Drivers for the community
- Improve environmental condition and integrate in to nature
- Job generation (in short and long term, including potential spill overs)
- Support innovation
Status of the project
Daneel Geysen, Group Machiels | ELFM – a case in Belgium
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Refuse Derived Fuel

Crude Syngas

Stage 1: Fluid Bed Gasifier

Crack Syngas

Stage 2: Plasma Converter

100k tpa

Ash

Gas Cleaning equipment

Plasmarok™

Clean Syngas

Power Island generating renewable power and heat

case in Belgium
Closing the Circle - Barrier

- Environmental Impact Assessment and permitting
  - Process description
  - Waterbalance
  - Risk for soil and groundwater pollution
  - Impact on air (emissions)
  - Impact of noise
  - Energy balance
  - Impact on people (mobility, emissions, safety, changes, …)
  - Impact on nature
  - Impact on landscape
Closing the Circle

- LCA/LCC
- LCA

- Comparison with do nothing scenario (no landfill mining)
Closing the Circle - Barriers

- Financing scheme (no gate fees)
  - Initial idea was power production
  - Financing based on green current certification system
    - GCC scheme changed

- Solution:
  - Part of input is fresh waste (RDF) to attract gate fees
  - No power production but higher value gas (H₂)
    - Market not clear yet (fuel cell cars)
  - Consider first demo, do not expect very high returns
- Risk
  - Big investment, long period

- Solution:
  - Split in 3 phases and allow to start
  - Change/improve concept/proces in next phases if possible
- No local market yet for heat and CO$_2$
  - No permit for greenhouses nearby
- Limited interest from plastics market in landfilled plastics
  - Questions about quality
  - Questions about the market take-up capacity and the effect on the market price of recyclates
Film (LDPE) recycling
- Grinding
- Washing
- Density separation
- Grinding
- Washing
- Drying
- Extrusion/granulation
- Not all landfilled wastes can be recycled/treated yet

- Solution:
  - ‘Final’ disposal for 10% of the total mass
  - Temporary storage
- Waste characteristics
  - Fines content (< 10 mm) up to 60 wt% 
  - Moisture content (up to 60 wt%)
Thanks