Energy from Waste – Amsterdam

Peter Simoës
Strategic Advisor AEB
simoes@afvalenergiebedrijf.nl
WtE Company

- Owned by Local government
- Partners: City Districts, 15 municipalities
- 400 employees
- Situated in harbor area Amsterdam
- Largest WtE plant in the world
- Largest Renewable Energy plant in Amsterdam
WTE plant (1993)
- 1.4 million inhabitants
- 850,000 tons of MSW

WFPP (2007)
- 530,000 tons of commercial waste
History: Waste Management in Amsterdam

From cleaning to sustainable recovery of energy & materials

Amsterdam 1877
4th generation: WFPP® in a nutshell

Waste Fired Power Plant

- Virtually zero-discharge
- Waste (endless stream; 53% biomass)
- Residues (<0.5%)
- Energy = Electricity & Heat
  - >30% net electrical efficiency
  - 100% renewable energy
  - 53% sustainable (CO₂-free) energy
- Valuable Materials
  - Sand & granulate for construction
  - (Non)-ferrous metals
  - Industrial salt, gypsum ....
High Efficiency concept WFPP®

850 kWh/ton = 30 %
Sustainability
EU Policy

WFD

Prevention / waste reduction

Re-use

Recycle

Energy from waste R1

Energy from waste D10

Land filling

Preferred environmental option

Least preferred environmental option
Emission levels

- NOx
- NH3
- C, tot.org.
- HCl
- HF
- SOx
- CO
- PM
- Hg
- Cd, Th
- HM
- PCDD/F

WFPP as %
Legal limit
Dutch limit
Energy & Climate policy

- **EU 5 x 20**
- **NL 2% energy savings per year, 16% renewable energy, 16% CO2 reduction**
City of Amsterdam powered by AEB
Integration with Waste Water Treatment Plant

Waste Water Treatment Plant
- Sewage sludge 100 kton/yr
- Biogas 25,000 m³/day

Waste Fired Power Plant
- Electricity 20,000 MWh/yr
- Heat 50,000 GJ/yr

Recovery

Water

Electricity 20,000 MWh/yr
Heat 50,000 GJ/yr

Waste water

Solid Waste
District Heating

- Supplying heat to companies and households in Amsterdam
- Joint Venture with Energy company in Amsterdam
- replace natural gas by heat from waste
- 12.000 houses connected
- Grow towards 50.000
How to capture the value?

- Bottom-ash: needs mining technologies
- Joint R&D with TU Delft
- Wet separation process (fully patented)
- Economically profitable (metal recovery)
- Avoiding large volume of CO2
Why did Amsterdam invest in WtE
Why did Amsterdam invest

- Large contribution to sustainable goals A’dam
- Sustainable electricity production (source, biomass)
- CO$_2$-reduction (11% of 2025 target for Amsterdam)
- More materials recovered from waste
- More revenue, lower waste taxes
- Strengthen AEB’s leading position in the waste market

Adding sustainable and profitable value for Amsterdam
Vision AEB
Long term strategy

- Growing towards an Sustainable Energy and Resources Company
- Work together in partnerships, Find the Synergy
- Work together to meet climate and energy ambitions of City of Amsterdam