Model economic cooperation and partnerships in waste management – case of Scandinavian countries

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Sweden

- Population: 9.4 million
- Area: 450 000 km$^2$
- Member of European Union
Treatment of household waste in Sweden

OVERVIEW 1975-2012

2.6 million tonnes

4.4 million tonnes
Political drivers concerning waste

1991 Municipal waste treatment plan

1994 Producers’ responsibility

2000 Landfill tax (35 USD/tonne, today 60 USD/tonne)

2000 Landfill ban on combustible waste

2002 EU: Landfill directive

2002 EU: Waste incineration directive

2005 Landfill ban on all organic waste
Political drivers concerning waste

2006 Incineration tax on combustible waste


2008 EU: All landfills have to fulfill the landfill directive

2010 Incineration tax is removed

2010 50 % of household waste to material recycling (incl biol treatment)

2013 EU: Waste prevention programmes established

2018 50 % of food waste to biological treatment (40 % energy recovery)
Amounts of waste to landfills (tonnes)

- Producers’ responsibility introduced
- Municipal waste planning compulsory
- Landfill tax introduced
- Ban on landfill of combustible waste
- Ban on landfill of organic waste and national target on food waste
- On-going national overview
Roles within waste management

**Waste generator:**
Households: Separation and leave/transport waste at indicated collection points
Companies/Industries: Management of own generated waste

**Municipalities:**
Collection and treatment of municipal waste
Information to households

**Contractors:**
Transport and treatment of waste

**Producers:**
Real estate owners: Space for waste separation

**Parliament/Government Authorities/Agencies:**
Collection and treatment of waste within the Producers Responsibility
The municipality’s responsibility and organisation

The municipality is responsible for
- collection and treatment of household waste
- Including similar waste from restaurants, stores, offices, etc

Municipalities deal with their responsibility in different ways and design their own waste management organisation

**Administration:**
- Almost 50% have formed municipal waste management companies

**Collection of municipal waste:**
- 30% inhouse operation
- 70% contractors

**Treatment of municipal waste:**
- 35% inhouse operation
- 65% contractors, mainly municipally owned
Regional waste management companies
Packaging and newspaper collection

- Coloured glass
- Uncoloured glass
- Metal
- Paper/cardboard
- Plastic – soft/hard
- Newspaper
Packaging and newspaper collection

77 stations in Borås
Material recycling

Plastics
- Flower pots, parts to car industry, construction materials, plastic bags etc
- Percentage: 26%

Cardboard
- New cardboard boxes, coating on gypsum boards
- Percentage: 75%

Metal
- Engine parts, tins etc
- Percentage: 68%

Glass
- Bottles and isolation material
- Percentage: 92%

Newspaper and toilet paper
Recycling centres
Recycling centers

- Reuse/Secondhand
- Bulky waste
- Garden waste
- Hazardous waste
- Electronic waste
- Inert waste
Household collection - curbside
2 household bins

Organic

Combustible

SP Technical Research Institute of Sweden

Borås Energy and Environment
A subsidiary of Borås Stadshus AB
Biological treatment

Anaerobic digestion

Composting

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Waste-to-Energy plant
Mix of fuels

The plot shows the mix of fuels to the electricity and heat production. Fossil free fuels stands for 91%
Economy for Waste to Energy in Sweden

- Model results indicate that waste incineration is expected to be an economically competitive alternative for district heating production during the studied period up to the year 2030. This provides that the national need for this waste treatment method will be met.
Waste economy in Borås City

• Waste taxation in Borås, a non-profit system
  
  >35% Transports (Collecting)
  20% Treatment
  20% Recycling Centres
  5% Sorting (Black/White bags)
  Rest. Overhead costs

• Fixed rate and dynamic rate, Borås 2013:
  
  – 1309 + 921-1567= 2230-2876 SEK/year (~250-325 €/year)

• Waste tax as a management control measure
  
  - Based on weight of waste
  - Mandatory or driven by cost
Economy and business in waste management

- Business is selling energy:
  - Biogas (busses, trucks, cars)
  - Heating (private persons, companies/industries)
  - Cooling (industries)
  - Electricity (Nordic electricity market – Nord Pool)
Waste Recovery
International Partnership in Borås

- Sustainable city planning
- Knowledge transfer and research
- Strategic environmental development
- Training program Capacity building

http://www.wasterecovery.se/