



Case Study – Municipal Sector Waste Incinerator

Waste Planning Practice Guide – Case Study Supplement

MSWI

Veolia Environmental Services, Sheffield

General

The Energy Recovery Facility (ERF) incinerates residual waste produced by Sheffield's residents. The facility generates electricity which is fed to the National Grid and it provides heat, in the form of hot water, to nearby businesses, households and local authority buildings through a network of insulated underground pipes, referred to as the "district energy network". A cooling system is also provided to some of Sheffield's public buildings. This facility replaced the outdated household waste incinerator which was located on the site.

Details

Information	Data
Fully operational	2006
Site (hectares)	2
Location	1.6km north east of Sheffield city centre
Maximum capacity (tonnes)	225,000
Current Processing capacity	225,000
Electricity production (mw/hr)	40MW of thermal energy (heat) for the District Energy Network and 21MW of electricity for the national Grid
Site	Heart of Sheffield's industrial area Chimney stack is 75 metres in height
District energy network	50km of underground pipe, supplies approx. 140 buildings

Veolia Environmental Services Ltd signed a Public-Private Partnership (PPP) contract in 2001. This included waste collection, treatment and the management of the district energy network. Following planning and permitting, the facility became operation in 2006.

Community benefits

District Heating System and its expansion – local buildings have a supply of a renewable source of heating
Cost savings for businesses installing and running the District Heating System, e.g. exemption to Climate Change Levy ¹
Landfill diversion
Reduction in CO2 emissions (2.5 tonnes CO2 every hour) in Sheffield – improved air quality
42 employees
Visitor/Education Room

¹ <https://www.gov.uk/green-taxes-and-reliefs/climate-change-levy>

Input

Residual wastes from households and businesses

Process

Residual waste is collected and tipped into the storage bunker at the ERF. The waste is lifted onto a feed hopper which feeds the waste into an incineration unit where it is burned at in excess of 850°C. Superheated steam is generated above the incinerator. This steam is used to drive the turbine, generating electricity for the National Grid and producing hot water for the District Energy Network.

Output

- Heat: 40MW supplying over 140 buildings
- Electricity: 21MW for National Grid
- Bottom Ash: 22% of waste burned (by weight). Sent to local recycling facility to be used as aggregate for the construction industry.

Adjusting to changing waste arisings

A new recycling scheme led to a reduction in supply to the facility. Veolia was granted permission to increase its catchment area to include a maximum of 22% of its waste from neighbouring authority areas. The facility now takes trade wastes.

Planning – Engagement

Liaison

Who: community representatives from resident groups, education, health and religious group representatives

When: **After planning application had been considered**

Purpose: provide a forum for people to discuss concerns

How:

- a liaison group
- a newsletter for residents

Main public concerns and mitigation measures

Concern	Mitigation
Traffic	Restrictions on timing of waste collections Method of transporting waste to the facility (bulk containers) to reduce number of vehicles
Odour and dust	Clear information dissemination focusing on how the facility eliminates odour (enclosure area, negative pressure which prevents odour escaping) Air extracted from waste reception areas by negative pressure is used as input air to the combustion plant, hence destroying odorous compounds.
Emissions to Air	Environmental controls through the environmental permit and monitoring
Noise	Use of low frequency equipment
Flies and Vermin	Waste is stored in enclosed areas Contract with pest control company for monthly visits
Waste reduction to plant and consequence for district energy customers	Extend area of collection Increasingly efficient heat exchanger equipment

Further Information on case study²

Veolia Environmental Services:

<http://www.veoliaenvironmentalservices.co.uk/Sheffield/>
<http://www.veoliaenvironmentalservices.co.uk/Sheffield/What-happens-to-your-waste/Energy-Recovery-Facility/>

² The Welsh Government is not responsible for the contents of these sites.