

Materials Resource Management Contract

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Visit to Sistema Ecodeco MBT plant

Date of visit

Wednesday 5th May – Thursday 6th May 2004

Officers' names

- Steve Waight, Cabinet Member for Strategic Planning and Environment
- Phillip Russell, Head of Wastes Management Services
- Tracey Taylor, Waste Local Plan Officer
- Kate Stacey, Project Officer, MRMC, Wastes Management Services
- Accompanied by Graham Kemp from Shanks and, in Milan, Sari Calabrese and Sergio Scotti from Sistema Ecodeco

Site

Two sites nr Milan, Italy were visited:

1. Montanaso Lombardo; and
2. Corteolona

1. Montanaso

Observations

The plant is contained in an industrial style building in a rural area, the nearest dwelling being a farm about 300m away, and is surrounded by trees. A river runs adjacent to the site and there is a lake in front of the green building which houses the MBT process. There is a power station with 2 tall chimneys next door to the plant and there are many pylons surrounding the site. The entrance has electronic entry gates and an automatic weighbridge is used to weigh all inputs and outputs.

Description of facility

The Sistema Ecodeco MBT plant uses the Biocubi Process, which was developed (and patented) by Ecodeco to obtain the highest possible recovery of energy and materials from MSW. The Sistema Ecodeco Group has been operating for over 25 years in the environmental services field and is the technology partner of Shanks who are developing the process in the UK which is being promoted as the Intelligent Transfer Station (ITS).

The technology appears to be well established and is used in four major reference plants in Italy which have been operating for up to 6 years. Three further plants are currently under construction in Italy.

Four sites have been granted planning permission in the UK, two of which have IPPC permits. These include an integrated facility for East London Waste Authority consisting of 2

Materials Resource Management Contract

MRMC site visits

Ecodeco units (120 ktpa total) HWRC, Transfer/bulking station for dry recyclates/green waste, 60 ktpa gasification plant and an education/visitors centre.

The Ecodeco plant units are modular (60,000 tpa) and can be paired to match required capacity. The Montanoso plant has a capacity of 60,000 tpa and a building footprint of 80m x 20m x 14m high. It was constructed in 1999 and started operations in June 2000 taking the MSW, after source segregation (kerbside), of glass, paper, plastics and in some cases the organic waste fraction from districts in Milan where there is 40% recycling. There is a plant nearby at Lacchiarella which has twin units, one at 60,000 tpa taking MSW and the other 40,000 tpa unit taking organic fraction for compost. It started operating in December 2002.

The system outputs are:-

- 50% solid recovered fuel as fluff – landfilled or used as fuel for industry (in the case of the Montanoso Plant – sent to the fluidised bed boiler at Corteolona)
- 25% water and carbon dioxide
- 3% ferrous
- 11% glass and stone
- 10.5% fines – compostable/landfill
- 0.5% non-ferrous

Process

- Stage 1: Biological Stage (biodrying)

The process takes place in a fully enclosed building where negative air pressure is maintained to minimise environmental impacts. Waste is unloaded from refuse collection vehicles into a tipping pit which takes place in a controlled environment with water sprays and airflow management to control emissions to the atmosphere. The reception pit has sufficient storage capacity to contain more than 1 day supply of waste and has an elevated perforated floor. Waste is picked up automatically by a programmable crane operated from the control room and transported to a shredder. The shredded waste (exit size 20-30 cm) is then transported into a buffer storage pit to produce a homogenous material. The material is then moved by crane to the aerobic fermentation area where the waste is placed in contiguous windrows. The area is divided into a virtual grid on the computerised control system which controls the crane movements and records when and where materials have been stockpiled.

According to the pre-set computer programme the crushed and homogeneous material is formed into heaps of up to 6 m height. The perforated floor and ductwork system allows air which is sucked in by fans, to be drawn through the waste and the void beneath the raised floor. This air is transferred to the bio-filters (a bed of woody material) mounted on the roof which neutralises odours before release. The air flow is controlled automatically by a computer system to ensure optimum temperature range (50-60 °C) is maintained so that material is apparently stabilised, sanitised and practically odour free in 12-15 days. By providing air the activity of micro organisms is stimulated and heat is released, causing the

Materials Resource Management Contract

MRMC site visits

evaporation of water present in the waste (biodrying). The most easily putrefied portion of the organic waste is decomposed, whilst the remaining material has a heating value of between 15 MJ/kg and 18 MJ/kg.

- Stage 2: Mechanical refining

Once the material has been aerated for 12-15 days it is automatically transported by crane to the recycling and recovery process area where the dried waste is separated into five fractions (ferrous and non-ferrous metals, glass, stones and combustible materials) by using a combination of sieving, weight separation and metal extraction and secondary shredding.

The stabilised waste fraction (approx 50%) can be landfilled or sent for conversion into energy as a secondary fuel. For use as Solid Recovered Fuel (SRF) the material is shredded to a suitable size i.e. dimension of around 10-15 cm.

Planning Comments

Access:

- Single unit serving 300,000 residents = 20 dustcart movements a day.

Visual:

- The unit was shed like as found on most retail parks
- Landscaping was low key i.e. pond, tress
- It was painted green which was visually attractive
- The plant was 300m from houses, other plants have been located adjacent to residential areas.

Odour

- The plant is under negative pressure to encourage odour and flies to remain inside the building.
- There was some odour when the lorries were unloading, but no more than other transfer stations/incinerators previously visited (ie Halewick lane/Chineham).
- When standing on the roof the biofilter located there had a distinct odour similar to composting sites but this was not obvious from the ground.

Local Plan Comments:

The type of use could be located on many industrial estates. In principal it accords with policy A1 (Deposit Draft Local Plan) subject to the usual development control policies ie noise, access etc. When considering the emerging Waste Local Plan (as recommended by Officers for Revision) it would be considered against policies A1 and/or A1b.

Other Comments:

- The biofilter located on the roof may give the biggest concern. It gave off vapour (which didn't rise very high). Consideration would need to be given of the visual appearance on a winter's day. The potential odour on a hot day would need to be evaluated.

Materials Resource Management Contract

MRMC site visits

- Care would be needed with access, and vehicle movements. Although in West Sussex material would probably be arriving from a transfer station meaning bigger lorries but less movement, nonetheless the traffic movements would need to be assessed. The site is staffed by 5 (approx) people with few car movements.

2. Corteolona

Observations

The site is in a rural area surrounded by trees. The waste facilities are all painted green to blend in but the chimney from the fluidised bed plant, although slim, does stand out from the surroundings even though the plant has been built 5 m below the ground level.

Description of Facilities

The site is an integrated waste management facility with sludge treatment, industrial waste treatment area, MBT plant, fluidised bed plant for power generation from RDF and landfill. The plant has a capacity of 60,000 tpa. The SRF from the MBT is fed directly into the fluidised bed plant via a conveyor and burnt to produce electricity (9.0 MWe). It also takes RDF produced by some of the other MBT plants.

The power plant started operating at the beginning of 2004 and is owned by Ecoenergia, a subsidiary of Ecodeco. It has a footprint of 120m x 45m with the boiler completely contained in a 32m high building, while the gas cleaning section is outdoor. The tallest equipment is the stack that reaches 60 m.

Comments on the two sites

- Health, safety and environmental impacts of the MBT process are reduced as far as possible through the process being self contained and being automatically managed, thus avoiding any possible contact with the operators.
- Based on evidence of the Lacchiarella plant the modular design of the MBT units means the process is flexible and can accommodate different waste streams.
- The SRF appears to be easily and safely handled, stored and transported and is suitable for use in advanced thermal processes which qualifies as a source of renewable energy under the Renewables Obligation Order. Additionally it is exempt from the Climate Change Levy and thus derives a significantly higher income from the power it produces. High waste diversion rates of materials away from landfill means Local Authorities can create income from selling Tradable Permits.
- Landfill diversion etc is only achieved as long as there is a market for SRF. SRF can be used in the cement industry and, although there is a developing market, the power industry is slow to take this on. In the UK Shanks have signed agreements with Blue

Materials Resource Management Contract

MRMC site visits

Circle and Rugby even though there will be no fuel for 2 years until the facilities are built.

- The situation in Italy is different to that of the UK because refuse derived fuel is considered as green energy and there are drivers to produce fuel. In the UK there are subsidies only for certain qualifying technologies.

Other comments to Note:-

- The question as to whether or not the material is 'inert' in line with the landfill directive was not answered. *Will this process really meet the Landfill Directive i.e. is the end product really stable? Surely if it is made wet then it would be active again.*
- For a fully integrated waste management facility such as at Cortelona the size of site required is larger than conventional incineration handling similar amounts of waste.
- It was stated that in the UK the MBT process would not meet the 2 stage process required under the Animal By-Products Regs.