

**Minutes
Environment Scrutiny Panel**

**14 November 2007
5.30 p.m.
Abbey Leisure Centre, Pity Me**

Present: Councillors Wolstenholme (in the Chair), Carr, Colledge, Crooks, Kelly, Martin, Mavin, Moderate, Simpson, Turnbull and Wilkinson

Also in Attendance: Councillors Kellett, Marsden and Wilkes.

Mr Jonathan Elmer – Sustainable Development Manager, City of Durham

Mr Gavin Scott – Policy and Regeneration Manager, City of Durham

Apologies

Apologies for absence were received from Councillor Mitchell.

Minutes

The minutes of the 17 October 2007 were agreed subject to the amendment to Agenda Item No.4, paragraph four; it was to be amended to read:

“Also the Chair suggested that new build properties should confirm to the standards as set out in the HIPs”.

Draft Report – Review of Fly Tipping, Recycling and Litter Pickers

The Panel agreed that subject to the amendments made at the meeting the report of the Review of Fly Tipping, Recycling and Litter Picker be sent to Scrutiny Committee for consideration.

Climate Change

The Sustainable Development Manager gave the Panel an update on the Council's position on Climate Change. He reminded Members that a report was ratified by Cabinet 18 July 2007, which committed the Council to produce a strategy; this is a high level commitment from the Council.

Presently, the Sustainable Development Manager is carrying out an audit of the Council's own omissions and comparing this with other Councils.

Note: 5.35 p.m. Councillor Wilkes joined the meeting.

The Sustainable Development Manager described that he was currently auditing existing levels of Carbon Emissions both stemming from the Council's own activity and that of the wider community. Checks were to be made on energy consumption levels and to calculate amounts of omissions from land fill. Closer inspection of the fuel consumption of the Council's fleet vehicles to establish a base line position and reduce CO₂ omission levels.

Note: 5.50 p.m. Councillor Martin joined the meeting.

The Sustainable Development Manager informed Members that gathering information had been difficult prior to 2004/5, as certain quantities e.g. fuel consumption were not recorded prior to this date. Therefore the Council's baseline position would be taken from 2005/6.

The Sustainable Development Manager then described the process developed for Self Assessment of council services, to identify means of achieving further emissions reductions, and reviewed some of the preliminary findings of self assessment. Efficient working practices should be considered to reduce the Council's carbon footprint – looking at a travel plan (how employees travel to and from work); home working, teleconferencing.

The Sustainable Development Manager advised the Panel that a working group would be made up of various senior officers to investigate how the authority could reduce its carbon footprint. Some of the areas which would be investigated would be Estate Management, Procurement, Housing, Planning and Transport.

The Policy and Regeneration Manager reminded the Panel that the Council not only deals with planning applications but, was also the planning authority carrying out planning policy, which was instigated by Government policy. At a regional level, the Regional Spatial Strategy (RSS) gives key policies on energy use and climate change. The authority is talking to developers to influence them to employ energy reduction methods and embed into applications that 10% of energy comes from renewable sources.

On a local level the authority has the local development framework which looks at suitable area for development using a detailed appraisal and scoring method.

Planning applications are subject to development control policies document and whilst the authority wishes to set out a sequence for a higher percentage of embedded reusable energy many in the development industry resist this to keep costs down. Also another area which compounds the problem is that the developers are not usually the owners of the building. The way to enforce this would be through new restrictions in building regulations.

Members enquired as to how many Council properties had cavity wall insulation and were advised by other Members that all Council properties had cavity and loft insulation and energy efficient central heating boilers. Members did point out that there were properties in the district where the cavity wall insulation could not be carried out as they old properties which had no cavity to fill.

Aerobic Digester

It was decided to allow time for Members to digest the information contained within this item and that it would therefore be discussed at the December Meeting.

Any Other Business

The Chair thanked the both the Sustainable Development Manager and the Policy and Regeneration Manager for their attendance at the meeting and for their informative presentations.

Actions for Next Meeting

- Invite the Building Control Manager to December meeting.

The Meeting terminated at 6.25 p.m.

DRAFT - REPORT OF THE ENVIRONMENT SCRUTINY PANEL

Report for Information – Visit to PARC – Aerobic Digester, Thornley Crossings, Durham – 24 October 2007

Present: Councillors Wolstenhome (Chairman), Colledge, Mitchell, Moderate, Turnbull and Wilkinson

Also in Attendance: Councillors Kinghorn and Marsden.

Mr John Wade – Waste Business Manager, Durham
County Council
Mr Malcolm Johnson – Regional Development Manager,
Premier Waste

Apologies: Councillors Carr, Crooks, Kelly, Martin, Mavin and Simpson.

1. BACKGROUND

The Environment Scrutiny Panel had previously looked at the topic of Recycling, and Panel Members expressed an interest to visit the nearby Aerobic Digester, located at the Premier Waste PARC (Premier Advanced Recycling Centre) facility at Thornley Crossings, Durham. This was to give Members a clearer understanding of one of the processes by which the City of Durham's waste is disposed of.

2. PREMIER WASTE

Premier Waste are one of the largest independent waste management companies in the U.K. who pride themselves on tackling the core environmental objectives of Government, industry and commerce, through the development of unique recycling, composting and diversion from landfill technologies.

3. PYROLYSIS OR AEROBIC DIGESTION?

Premier Waste in 1999/2000 identified a need for alternative waste treatment. In the past they had operated 12 landfill sites, currently they operate 2 sites, one being located in County Durham (Joint Stocks at Coxhoe).

In 2000, Premier Waste narrowed the potential methods of waste treatment to two possibilities, those being:

In-Vessel Aerobic Digestion (the accelerated breaking down of the organic material by bacteria in the presence of air)

Pyrolysis / Gasification (a thermal treatment similar to the production of coke from coal, not to be confused with incineration)

After two small trials of a gasification process, it was clear that this method offered two main disadvantages. One was that the process was best suited for waste that was primarily homogeneous (which municipal waste, by its very nature, is not) and secondly, the waste product from the process is technically hazardous. Accordingly, this waste would need to be disposed of by the proper and correct fashion which would prove both difficult and expensive.

Therefore, the decision was made to pursue aerobic digestion and in 2001, the first steel "tower" (Tower 1) was constructed. This offered a 50% diversion from landfill for material being processed, which enabled Premier Waste to offer Local Authorities a method by which to help meet their LATS (Landfill Allowance Trading Scheme) targets for diversion from landfill.

4. FURTHER CONSTRUCTION

Tower 1 was operational in 2002 and a second tower (same size with some minor design improvements), Tower 2 was built and it came on-line in January 2005. Following the success of these first two towers, Premier Waste received funding from DEFRA (Department for the Environment, Food and Rural Affairs) to build a third larger tower (Tower 3) from reinforced concrete (rather than the steel construction of Towers 1 & 2) in order to ascertain whether this method would have improved heat retention, which in turn would benefit the digestion process / efficiency.

The facility at Thornley Crossings also boasts a newly constructed Visitors Centre as the DEFRA funding was not only to help build these types of alternative waste treatment facilities, but also to promote them to potential customers as a method by which to meet various Government and E.U. targets placed on both the public and private sector – such as DEFRA's WIP^[1] (Waste Implementation Programme).

5. DIVERSION TARGETS

Currently, to meet with DEFRA and Audit Commission rules, for an amount of waste to be counted towards diversion from landfill, it must physically be taken to the waste treatment facility and processed. For County Durham, it may be preferable if the target for Authorities could be pooled such that a percentage of each constituent Authority could be traded off against the diversion of all of Easington District municipal waste to the digester (as it is within Easington District).

[1] The Waste Implementation Programme (WIP) responds to the package of strategic measures recommended by the Strategy Unit (SU) report "Waste Not, Want Not" published in November 2002, and the Government's Official Response. The remit of the Strategy Unit was to consider action to be taken to help the UK to meet the legally binding targets under Article Five of the EU Landfill Directive. Taking account of the derogations available to the UK, the targets are:

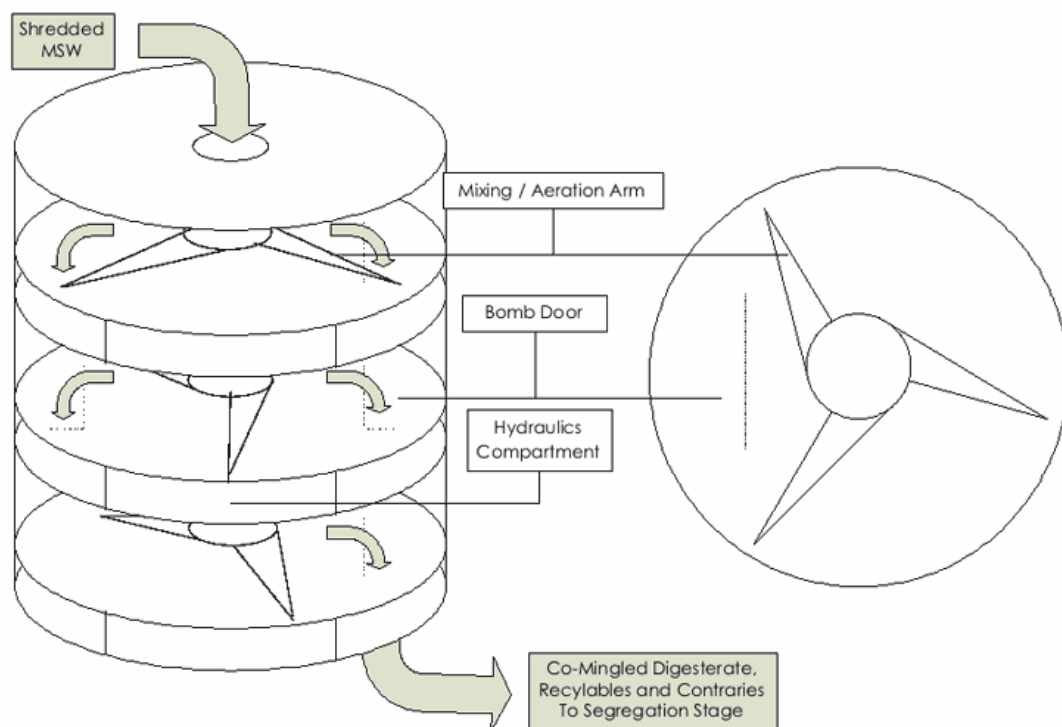
- By 2010 to reduce biodegradable municipal waste landfilled to 75% of that produced in 1995.
- By 2013 to reduce biodegradable municipal waste landfilled to 50% of that produced in 1995.
- By 2020 to reduce biodegradable municipal waste landfilled to 35% of that produced in 1995.

This would give a same net effect, but would save on the associated cost and energy considerations associated with the longer transport routes (44,000 miles) for waste from the other Districts. Unfortunately, this idea has not been accepted by DEFRA, and also this would not fit with the Audit Commission definition of some BVPIs (Best Value Performance Indicators). It may be possible to look at this situation again in the future.

6. DIGESTION PROCESS

The 3 towers require a steady influx of material to ensure that the biological process can be maintained. The process starts with the loading of MSW (Municipal Solid Waste) into a shredder after which there is an initial extraction of ferrous metals by use of powerful magnets. The shredder leaves the waste in “tennis ball” sized pieces as this has proved to be the optimum balance between surface area for digestion and particle size to allow for sufficient aeration of the material to maintain the aerobic digestion process.

Waste is then loaded by conveyor into the top of the towers, each tower being comprised of three composting compartments. Each composting compartment contains a large 3 limbed aeration and mixing assembly and a set of bomb doors down which the waste drops as it moves from one level to the next (Fig.1).



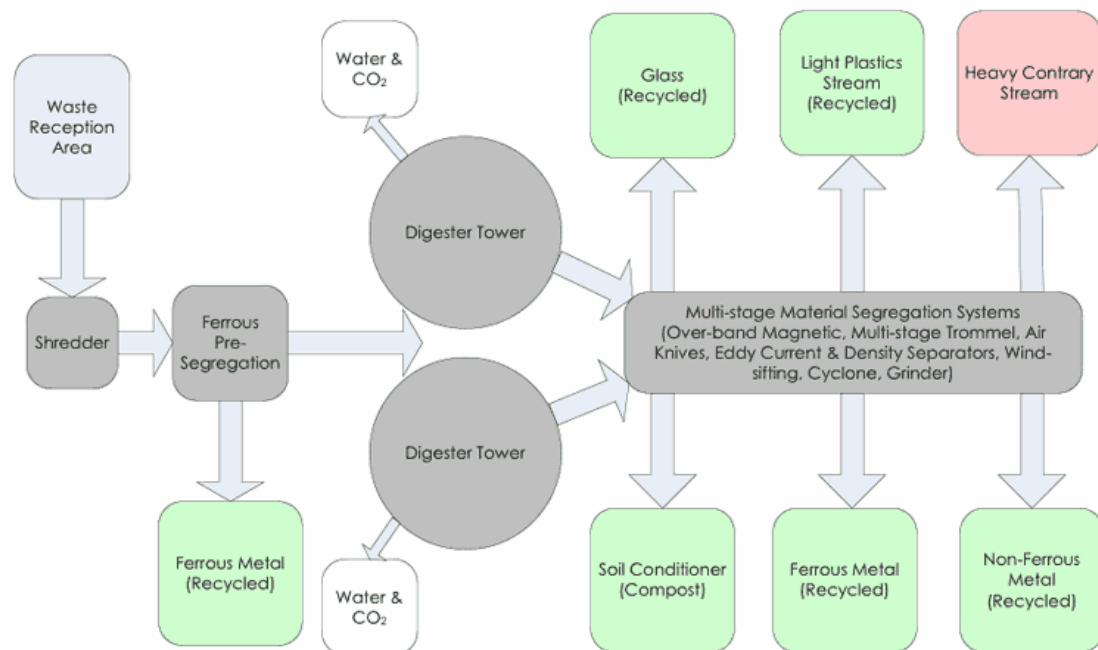
(Fig.1 – Schematic of a Digestion tower)

Waste spends two days sealed in each level, its temperature being controlled between pre-set thresholds by addition of air, agitation through mixing (the arms moving rather like the second hand of a clock, i.e. in fixed movements rather than a continuous motion due to the mass of the waste being processed) and the rate of extraction of compartment atmosphere through the bio-filtration system.

After 6 days the bio-waste fractions have been substantially stabilised and composted. This compares favourably with many anaerobic digestion systems which can take several weeks to fully break down material.

The material once it has passed through the tower is considered sanitised. As MSW naturally contains a proportion of kitchen waste, there are requisite steps^[2] that required by law to ensure the waste after treatment is not hazardous.

The removal of potentially harmful bacteria (such as E-Coli and Salmonella) is undertaken by heating up the material to 70°C. As the optimum temperature for the bacteria involved in the digestion process is around 55°C, this final 70°C “blast” is undertaken at the end of the process as not to affect the digestion efficiency. The mixed stabilised waste is unloaded and goes through a multistage segregation process, incorporating trommels, air-knives, ferrous and eddy current segregation (Fig.2).



(Fig.2 – Flow diagram of the various processes, noting this is diagram represents a pre-Tower 3, i.e. a 2 tower arrangement)

The mixed stabilised waste consists of the broken down organic material, plastics (mostly from plastic carrier bags) metals (e.g. cans), glass (e.g. bottles) with some other materials (brick fragments etc.). These materials are then separated by various processes. Ferrous metals are separated (for a second time) by magnets and collected to be recycled. Non-ferrous metal have eddy currents induced such that these metals are repelled by further magnets to allow for their separation. As the Kerb-It Scheme (also operated by Premier Waste) separates a lot of the cans from the waste at source, a lot of the metal materials recovered at the digester are those associated with DIY and automobiles.

The next stage is to effectively sieve the material through a 16mm mesh screen to take out the larger non-recyclable materials such as plastic bags, old shoes etc. Unfortunately, this is the percentage of waste that currently can only be disposed of at landfill.

[2] Regulations impose a temperature of 60°C be maintained for 2 days or temperature of 70°C for 1 hour to sanitise the waste.

The fine filtered material is then finally put through a density filter (vibration device) such that small fragment of glass and stone are separated from the CLO (compost-like product). Ironically, the small fragments of glass and brick mimic the physical properties of the aggregates that must be added to the CLO, but consumer expectations dictate that fragments of glass would not be acceptable within the product.

Batch control and visibility is an important part of this system – we have comprehensive temperature records for every batch and traceability to a batch numbering system that is preserved through out the process.

7. PRODUCTS / USE

The primary product of the process is a brown, fibrous compost predominantly consisting of organic matter. After processing, it is polished in windrows for 6 weeks.

The compost produced by PARC is used as a component in the manufacture of a topsoil product called ParcGro. ParcGro conforms to BS3882 topsoil standards and meets Contaminated Land Exposure Assessment (CLEA) and Dutch soil contamination standards for agricultural use, but Premier use it exclusively, in line with Waste Management Exemptions in brown-field site restoration.

One use was during the Foot & Mouth outbreak to provide backfill and also it is used at the landfill site at Coxhoe.

The particular application that Premier is focussing on in the north east is in the development of Short Rotation Willow Coppicing on former colliery and landfill sites (at Willington). Premier has already established contracted long term markets in this sector for compost outputs of around 400,000 tonnes per annum, mainly related to renewable energy crops.

8. COST EFFECTIVENESS

The cost of processing waste via the Digester compares to landfill as follows:

£50 per tonne	-	Landfill
£65 per tonne	-	Kerb-It (<i>paper, cans & glass only</i>)
£75 per tonne	-	Aerobic Digestion

However, as Landfill Tax increases (£8 per tonne per year from the next three years, then a possible further increase beyond that) the cost effectiveness of digestion will move ahead of dumping to landfill. Also with the reduction in landfill sites being available the cost for dumping could increase significantly.

It should be noted that household waste only comprises 10% of the total amount of waste produced in the UK. Therefore, to make a realistic impact on waste, industry would need to take up the challenge of reducing the amount of waste produced and increase the recycling rate of that waste that is produced. Indeed, this is an area many waste management companies (including Premier) are looking at. An example is collection of the food waste from Supermarkets, this is a excellent opportunity as the material is ideal for processing via aerobic digestion.

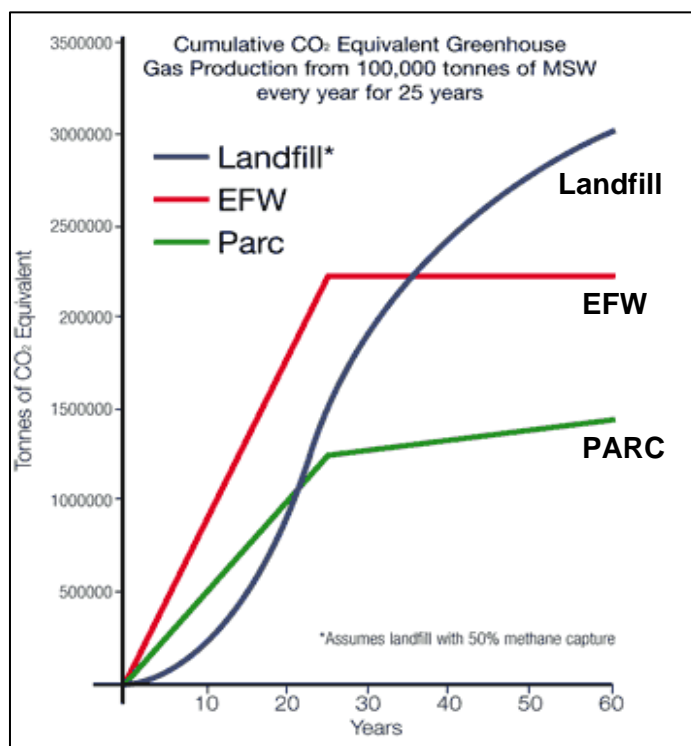
At this time however, companies do not have performance targets laid down similar to those for Local Authorities, the only influence is via increases to the cost of disposal to landfill (landfill tax) and therefore in the next 5-10 years the cost implications may lead many companies to look at alternatives to landfill.

The realistic uptake of recycling via Kerb-It style schemes is approximately 17-20%. Therefore, any further increase in diversion from landfill would need to come from alternative waste processing. The current average figure for diversion to landfill in County Durham is 70%.

Initially the amount of waste, once processed by the digester, diverted to landfill was between 50-70%. Now due to improved processes within the digester and extra facilities at the Joint Stocks Recycling Centre at Coxhoe the amount now diverted to landfill from the digester is in the region of 20-30%.

If all waste were processed by this method this would represent a significant improvement in the amount of waste sent to landfill. In Teesside, the diversion rate is 5% as they use incineration techniques to get rid of waste.

However, this does not take into account the waste gas produced – heavy in carbon dioxide (CO₂) with a comparison over time being set out at Fig. 3 below.



EFW – energy from waste – e.g. incineration / anaerobic digestion

PARC – Premier Advanced Recycling Centre

(Fig.3 – Comparison of Carbon Dioxide output over time)

Premier Waste have PhD Students from Durham University carry out studies into the gas produced from the digestion process from end to end and produce models to allow for further improvements to be made. Indeed the model is to be refined in February 2008 and it is hoped improvements can be gained.

9. IN THE FUTURE

Unfortunately, plastic bags prove to be a large percentage of the waste that cannot be effectively recycled. There are two points at which plastics can realistically be separated, either at the front end, i.e. at the household / Household Waste Recycling Centres (HWRCs) or to be treated and separated at the back end, i.e. after collection at waste processing facility.

Whilst many people wish to have plastic included within the Kerb-It scheme, it would present an increase in cost from £65 per tonne to in the region of £200 per tonne.

Whilst the plastics can be extracted by the various processes within the digester, the individual polymer types cannot be separated.

This combination of plastics can be used to form a hardwearing low grade plastic material suitable for garden furniture, park benches etc. the commercial demand is for the individual polymers rather than the blend. Possibilities for improved separation include a German system using optical sensors to identify the different types of plastic.

The obvious method to decrease the amount of plastic in the waste stream would be for industry to reduce the amounts of plastic packaging and perhaps use less differing types of plastics, simplifying the recycling process for the public.

It may be that in the future, "Producer Responsibilities", similar to those found in the electronics industry, may force industry to either fund Local Authorities to enable recycling or to provide facilities for the processing of the waste.

Durham County Council secured funding from DEFRA to produce a Waste Analysis Report to determine the types of waste produced and the distributions across the County. This would in turn help to plan for not only waste collection, but also to help allow more specific recycling campaigns to target areas that may have a particular problem.

10. FURTHER SITES

Premier Waste have anticipated the need for further sites to cope with the increase in the amount of waste that will come from Local Authorities and Industry, wanting to either meet targets and / or reduce costs as landfill tax increases. Accordingly, Premier Waste secured planning permissions for a six tower facility at Tursdale (with treatment off-site). Also, planning permission for a site near the Wildfowl & Wetland Centre at Washington which would deal with commercial waste and have a facility to process “dry-recyclables”, i.e. waste collected for recycling via Kerb-It style schemes. Premier Waste also have in place the requisite licenses and accordingly, when pitching for waste contracts, they are in a position to proceed quickly once funding was released.



(Fig.4 – In front of Tower 3, left to right: Democratic Support Assistant, City of Durham, Councillors Marsden, Mitchell, Moderate, Wolstenholme [Chairman], Wilkinson, Colledge, Kinghorn and Turnbull, Malcolm Johnson – Premier Waste)