Visit to EnviRecover at Hartlebury 18/10/23

EnviRecover is the Energy from Waste Plant that processes residual domestic and commercial waste (that which is not recycled) from Worcestershire and Herefordshire by burning the waste, recovering the heat as steam and using a steam turbine to generate electricity. The plant was built between 2014 and 2016.



12 members of our group braved the lousy weather and travelled in four cars to the plant arriving at 2:00pm. On arrival we were greeted by Jason, the plant manager, who conducted our visit. After an introductory description of the plant and process we were equipped in safety gear and given a conducted tour of the plant.

The plant processes around 215,000t/year of mixed waste and generates about 135000MWh of electricity, enough to power 38000 homes.

The waste treatment part of the plant is maintained at a slight negative pressure to minimise odours to the surroundings. Lorries enter the plant and their contents are tipped into chutes which lead to bunkers having a capacity sufficient to hold 15,000T of waste. These bunkers have two automated cranes overhead with grabs which are used to mix the waste to make it more homogeneous and load the furnace. We saw this part of the plant from the control room which gave a view that could well be used as the setting for a science fiction film set in some dystopian future! The control room was pleasant and sophisticated with a DCS system and multiple screens showing the process information in great detail as well as some larger screens which gave an overview showing the trends of main parameters.

The waste is transported through the furnace on hydraulically operated overlapping sliding plates There are five combustion zones each with its own combustion air supply to take the waste from ignition through combustion and finally convert it to ash. The combustion chamber is large and the upper part has to be maintained above 875C to break down Volatile Organic Compounds arising from things such as plastics. We were able to look through inspection ports at the ashing end of the furnace and see the bed of waste moving through the combustion zones towards us. The mixed nature of the waste can be clearly seen with metallics sticking up out of the combustion bed. The ash produced is about 25% less in weight than the waste feed. Metallics are removed from the ash magnetically and it is then shipped off site for further processing before being used in the construction industry.

After the waste gases leave the combustion chamber they pass through tubular heat exchangers where the heat is used to produce superheated steam at 80 Bar which is sent to the adjacent steam turbine and generator house. The cooled gases then go into a reactor vessel where they are dosed with chemicals (lime, activated carbon and ammonia) to treat pollutants (NOx, SO2…) and adjust the Ph before passing through bag filters and discharging to atmosphere via an 80m chimney. Fly ash from the bag filters is also recycled via the construction industry.

The calorific value of the waste is about 50% that of coal and at the time of our visit the plant was exporting a very steady 18MW of electricity. The plant is run to maintain a constant output and the feed rate and process variables controlled accordingly.

We did not visit the turbine house which would be similar to that found in a small power station. Electricity is generated at 13kV and transformed up to 66kV before joining the grid.

Pollution control is extensive, and the plant operates well within the consents agreed with the Environment Agency. The data on the exit flue gas emissions is provided to the EA continuously.

The plant runs 7 days a week and 24 hours a day with an annual shutdown of 2 to 3 weeks. Availability is currently running at 99%. The annual shutdown produces some challenges as the building is no longer under negative pressure but must continue to receive waste into the bunkers so smell has caused complaints from local residents. They are addressing this with better deodorising and have improved the situation. After shutdown the plant is brought back up to operating temperature slowly using diesel burners.

The plant is operated by 44 people including management and services. Three operators work on each shift.

The building and equipment were clean and well managed. The process equipment and controls were excellent and well-designed. A very interesting visit which we enjoyed.



So what does this mean to the environmentally conscious person?

- Recycle as much waste as you can.
- Minimise the amount of non-recyclable waste.
- The non-recyclable waste is burnt in an efficient, well controlled and monitored way but nevertheless produces CO2 and pollutants in a manner analogous to a fossil fuelled power station and contributes to global warming.
- The incineration of our non-recyclable waste is probably environmentally better than land-fill with it's problems of toxic leachate and methane emissions.