

1.0 Introduction

1.1 Summary

Under Annex II of the Waste Framework Directive, the proposed waste to energy plant is deemed to be a Recovery Operation (R1) as long as the criteria set out in the footnote (*) to Annex II and the guidance document on the R1 efficiency formula are met.

As the facility is designed and will be operated primarily to treat municipal solid waste (MSW) which is non-hazardous then the activity concerned is a Recovery Operation.

As is the case with the Indaver waste-to-energy facility in Duleek, other wastes, such as industrial hazardous and non-hazardous wastes will be treated at the facility and planning permission has been attained to treat a maximum of 24,000 tonnes per annum at the Ringaskiddy facility.

The treatment of smaller quantities of wastes other than MSW does not affect the overall status of the plant as long as the facility can maintain the overall energy efficiency criteria by including these waste types as input.

Under Section 4.3 in the application form on the Eden portal, Indaver is required to identify “*all recovery/disposal activities and capacities relevant to the operation*”. The relevant recovery activity in this case is “*R01 - Use principally as a fuel or other means to generate energy*”. The form has been completed accordingly but when entering the List of Waste codes that are proposed to be treated in the facility (in the same section 4.3 of the application form on Eden), hazardous waste codes cannot be entered.

It is only when a waste disposal activity is selected in the form that the hazardous waste codes can then be added and saved. In order to complete the list of waste codes the disposal activity “*D10 - Incineration on land*” has been added.

Indaver would like to point out that this activity is not required for the operation of any part of the proposed facility at Ringaskiddy and was merely entered to facilitate the completion of the entries for the List of Waste codes in the Eden system.

2.0 Demonstration of Capacity Calculations

The following description supported by Attachment 4-3-4 “*R & D Activity Capacity Calculations*” will demonstrate how the tonnage capacity of the installation has been calculated for the Ringaskiddy facility based on a thermal input of 80MW.

2.1 Thermal Capacity (Boiler Size) & Calorific Value of the Incoming Waste

2.1.1 Thermal Capacity

For the design of any waste-to-energy facility, the first question to ask is what size of plant is required. Ultimately, this is decided by the local market needs, government/local policy and other local factors but is typically translated into a number of tonnes to be treated/processed per annum.

When contracting for a plant to be built, the number of tonnes of waste to be treated per annum must be translated into a request for a plant with corresponding thermal capacity. Thermal capacity is the size of boiler required to safely extract the amount of heat generated day to day and hour to hour by the incineration of the waste. An assumption, therefore, must be made about the energy content or calorific value of the waste.

The majority of the waste (80% to 90%) to be treated at the facility will be MSW but the calorific value of this waste stream varies due to seasonal factors and the waste management behaviours of the population at large. There are also other waste streams that will be accepted (albeit in smaller quantities) which have very different calorific values. In order to demonstrate the influence of these variables on the plant capacity, 12 scenarios have been calculated for different quantities of different waste streams and for three different CV values of MSW (high, average & low) in Attachment 4-3-4 “*R & D Activity Capacity Calculations*”.

This document demonstrates that an 80MW waste-to-energy plant can treat between 227,000 and 257,000 tonnes per annum based on an average number of operating hours (availability) per annum of 8,000 hours. This difference is based on the assumptions of the relative amounts of each waste stream and the associated energy content of them.

It should be stressed that the legal limit for the acceptance of waste at the plant will be 240,000 tonnes per annum but in any one year, that could be all MSW and no other waste types or a mixture of 85% MSW, 10% hazardous waste and 5% sludges and other waste types.

Of this 240,000 tonnes per annum, the maximum amount of hazardous waste that can be accepted at the plant is 24,000 tonnes per annum.

2.1.2 Calorific Value (CV) of the waste

Due to the variation of the CV of the incoming waste streams, the range of CV values that could be experienced by the plant must be specified. For this plant a range of 8MJ/kg to 14MJ/kg would be typical. The upper and lower limit combined with the thermal load of the boiler provide the basis for a combustion diagram (see example for the Meath plant below) that a supplier will use as the cornerstone of their overall design for the plant.

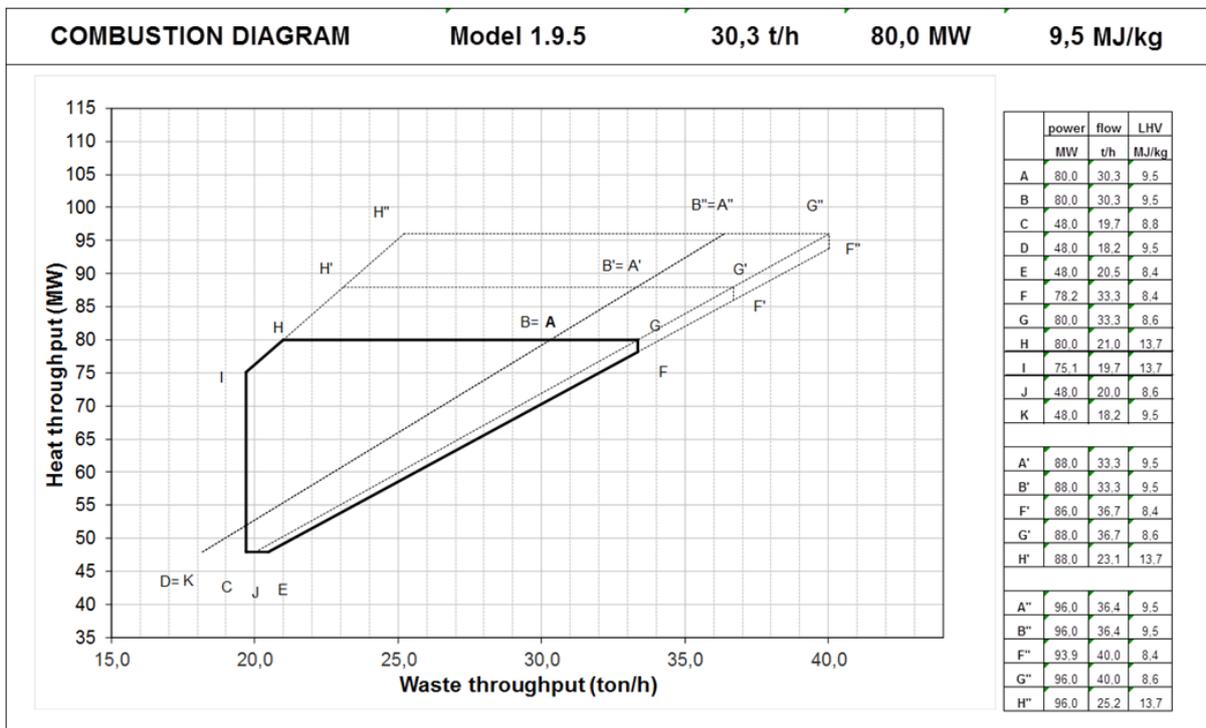


Figure 4.1

With reference to Figure 4.1 above, in order to maintain the same thermal load of 100%, if the average CV of the waste increases (moving from right to left on the diagram), then less tonnes per hour can be processed.

However, the overall point here is that the plant is designed to be flexible and can handle a variety of waste streams with a variety of calorific values.

3.0 R1 Code for the facility

The facility will be designed to meet R1 efficiency criteria in order to be classed as a recovery operation pursuant to the waste hierarchy, a central tenet of EU waste policy (as set out in Annex II of the original Waste Framework Directive and as retained in the recently adopted revised Directive on Waste) and which sets out a non-exhaustive list of recovery operations which includes material recovery, energy recovery and biological recovery). It must meet or exceed an efficiency of 0.65 according to the R1 formula in order to be classed as a recovery activity (R1) according to the waste hierarchy.

The facility will be designed to ensure that the criteria for achieving R1 status will be achieved. The guidance document on the calculation of the R1 formula states that as long as the facility is primarily for the treatment of MSW, then even though other waste types are treated (and permitted by the licensing authority), the R1 status is still applicable as long as the energy input from these other wastes is included in the overall calculation.

Hence the guidance tells us to look at the overall mix of the waste (some with high CV and some with lower CV) and its energy content and not the individual waste streams to decide on the applicability of the R1 status. This also makes sense from an operational perspective as there is constant variability in the incoming CV of MSW and it is extremely helpful to have higher and lower CV waste streams available in your portfolio of waste to help balance the overall CV of the waste as fed into the furnace.

4.0 References

[R1 Guidance Document](#)