

Attachment A.1 Non Technical Summary

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ATTACHMENT A1 – NON TECHNICAL SUMMARY

A.1.1 Nature of Facility

Dublin City Council (the Authority) acting on behalf of the four local authorities for the Dublin Region, i.e. Dublin City Council, Fingal County Council, South Dublin County Council and Dun Laoghaire Rathdown County Council, proposes to establish a waste to energy (WtE) facility (the Facility) to thermally treat household, commercial and non-hazardous industrial waste. The proposed Dublin WtE Facility will have a design capacity to thermally treat up to 600,000 tonnes of waste annually and will be located on the Poolbeg Peninsula in Dublin.

Elsam Dublin Waste to Energy Ltd has been commissioned by Dublin City Council to prepare Waste Licence Application for the proposed development. The project is known as the Dublin Waste to Energy Project (the WtE Project) and is part of the implementation of the integrated waste management strategy for the Dublin Region as detailed within the current Dublin Region Waste Management Plan.

The proposed WtE facility will be located on the Poolbeg Peninsula in Dublin. Most of the Site is located south of Pigeon House Road and is rectangular in shape measuring circa 160 m x 340 m and covers an area of approximately 5.5 hectares (13.6 acres). The location of the Site can be seen in Figures 1 and 2 below.



Figure 1 Location Of The Site



Figure 2: Aerial view of proposed Dublin Waste to Energy Facility from the North

A.1.2 Class or Classes of Activity

The principal class of activity proposed for the WtE Facility is Class 8 of the Third Schedule of the Waste Management Acts 1996 to 2003 namely

'Incineration on land or at sea'.

Other activities proposed for the proposed WtE facility are covered under the following classes of the Third and Fourth Schedule:

Third Schedule (Waste Disposal Activities)

Class 6. *Biological treatment not referred to elsewhere in this schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 5 or paragraphs 7 to 10 of this schedule.*

This activity is limited to the additional of a biological treatment chemical to the cooling water system to prevent fouling.

Class 7. *Physico-chemical treatment not referred to elsewhere in this schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 5 or paragraphs 8 to 10 of this schedule (including evaporation, drying and calcination).*

This activity is limited to physico-chemical treatment within the flue gas treatment system.

Class 10. *Release of waste into a water body (including a seabed insertion).*

This activity is limited to the discharge of cooling water from the proposed WtE Facility to Dublin Harbour.

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Class 11. *Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.*

This activity is limited to the mixing of waste within the waste bunker.

Class 12. *Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.*

This activity is limited to the loading of residues/ash into containers prior to export from the site.

Class 13. *Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.*

This activity is limited to the storage of waste within the waste bunker and waste quarantine area.

Fourth Schedule (Waste Recovery Activities)

Class 3: *Recycling or reclamation of metals and metal compounds*

The facility may be retrofitted with ferrous and non-ferrous metal separation system.

Class 4. *Recycling or reclamation of other inorganic materials*

As the WtE technology expands the facility may be retrofitted with systems for recycling or reclamation of other inorganic materials

Class 6. *Recovery of components used for pollution abatement.*

As the WtE technology expands the facility may be retrofitted with systems for recovery of components used for pollution abatement

Class 8. *Oil re-refining or other re-uses of oil.*

The auxiliary burners might be operated on a reusable oil product. The auxiliary burner will however not be fed with fuels which will cause higher emissions than those resulting from the burning of gas oil as defined in Article 1(1) of Council Directive 75/716/EEC, liquefied gas or natural gas.

Class 9. *Use of any waste principally as a fuel or other means to generate energy*

This activity is limited to utilisation of waste as a fuel to produce electricity from the primary site processes.

Class 13. *Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.*

This activity is limited to the storage of waste within the waste bunker and waste quarantine area.

A.1.3 Quantity and Nature of Waste

The types of wastes to be accepted at the Facility include:

- Household
- Commercial
- Industrial Non-Hazardous Waste

Waste will be accepted only from permitted waste hauliers. No hazardous waste will be accepted at the facility.

The proposed quantities of waste to be accepted at the proposed Facility are given in the table below.

WASTE TYPE	TONNES PER ANNUM (proposed) ^(Note 1)
Household	0-600,000
Commercial	0-600,000
Sewage Sludge ^(Note 2)	0-80,000
Industrial Non-Hazardous Sludges	0-80,000
Industrial Non-Hazardous Solids	0-600,000

Note 1: This application is being made for Household, Commercial and Non-Hazardous Industrial waste which in aggregate is not to exceed 600,000 tonnes per annum. The detailed split of the types of waste is unknown at the time of submission of this application

Note 2: In the event that land spreading of sludge will no longer be an option due to environmental constraints, it will be possible to pump the sludge directly to the proposed WtE facility for thermal treatment

A.1.4 Raw and Ancillary Facilities

A number of consumable materials will be used in the WtE process. The principal consumables that will be used onsite will be used for flue gas cleaning. These will be activated carbon and lime, ammonia solution, sodium hydroxide and water. Diesel and liquefied petroleum gas (LPG) will be used for the auxiliary burner system, the emergency generator and for any vehicles permanently used on site. Activated carbon and lime will be stored on site in silos. Ammonia solution, sodium hydroxide and diesel will be stored in bunded tanks. LPG will be stored in small quantities on site. Due to quantities of relevant materials stored onsite, the WtE facility will be regulated by the Health and Safety Authority under rules that control major accident hazards involving dangerous substances (COMAH).

A.1.5 Site Plant, Methods and Operating Procedures

There will be three buildings on the Site:

- (a) Main process building
- (b) Cooling water pump house
- (c) Security building

The main building will be approximately 200m long by 130m wide by 52m in height, at the highest point. A schematic of the waste to energy process is shown in Figure 3 below.

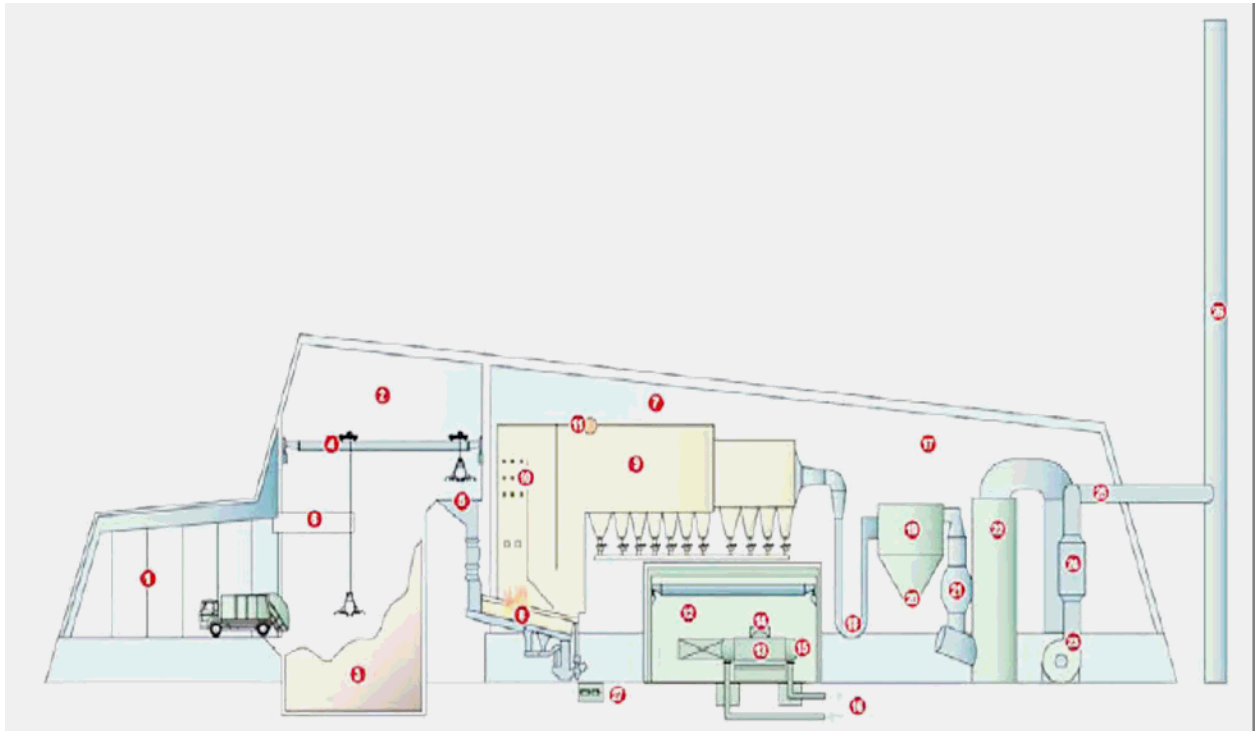


Figure 3 Schematic Diagram of the Waste to Energy Process

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1. Waste reception hall
2. Waste bunker compartment
3. Waste bunker
4. Waste crane for feeding the boiler grate
5. Waste hopper
6. Control room
7. Boiler area
8. Grate
9. Boiler, where the heat energy is transferred from the flue gas to the boiler water
10. NO_x reduction by spraying ammonia water into the flue gas
11. Boiler drum, where water and steam are separated
12. Turbine room
13. Steam turbine
14. Generator, producing electricity
15. Condenser, where the remaining heat energy in the steam is cooled
16. Cooling system
17. Flue gas treatment area
18. Activated carbon and lime are added to the flue gas to bind dioxins and other components
19. Fabric filter, where the flue gas treatment residue is removed from the flue gas
20. Extraction point for flue gas treatment residues
21. Flue gas cooler
22. Two-stage wet scrubber for reduction of HCl, SO₂, HF and Hg emissions
23. ID fan
24. Silencer
25. Emission Monitoring
26. Stack
27. Bottom ash for recycling

1: Waste Reception Hall

The waste reception hall will handle up to 50 waste trucks per hour. There will be a series of chutes, ample space for the waste trucks to manoeuvre and an area for inspection of incoming waste. The waste reception hall is kept under constant negative pressure to avoid the leaking of any odours to the surrounding environs.

2 & 3: Waste Bunker Compartment and Waste Bunker

Waste will only be received in the opening hours as specified in the operational licence from EPA, but incineration will take place 24 hours a day/365 days a year. The waste bunker will be designed to be large enough to ensure that the incinerator can store sufficient waste to allow a continuous feed of fuel outside of waste acceptance hours.

4 & 5: Waste Crane and Hopper

Two waste cranes will mix the waste and feed the waste into the furnace inlet hopper. A third grab will be on stand-by in case of maintenance or breakdown. From the hopper the waste will be pushed into the grate at an appropriate rate.

8: Grate

The facility will have two parallel independent incineration lines. Each line has a capacity of 35 tonnes/hour, i.e. the capacity of the facility is 70 tonnes/hour. The actual incineration of the waste takes place on the grates. The waste is continuously moved forward at a controlled speed to ensure optimum burnout. The ashes will be deposited into the bottom ash bunker. The grate is water-cooled and the hot water from this cooling process will be collected and used for pre-heating.

27: Bottom Ash Collection

The bottom ash will be collected and stored on site in a bunker.

9: Boiler

The hot gas from the incineration process will be led through the boiler in four passes – three vertical and one horizontal. The boiler walls will be lined with steel pipes and the heat energy from the gases turn the water in the pipes to steam, which is subsequently fed to the steam turbine.

12, 13, 14, 15 & 16: Steam Turbine and Electricity Generator

The steam turbine drives a generator producing electricity. Approximately 480,000 MWh will be fed to the National Grid in a year. This amount of electricity is equal to the demand from approximately 50,000 homes. The plant will be designed to allow for a district heating network, and will have the potential for heating future housing and office developments in the area.

10, 17, 18, 19 & 22: Flue Gas Cleaning

After releasing their heat, the flue gases pass through a series of cleaning processes, which will reduce the stack emissions to the level specified by the EPA – in accordance with the Waste Incineration Directive as implemented in Ireland by the European Communities (Incineration of Waste) Regulations 2003. The various processes and systems reduce dust particles, nitrogen oxides (NO_x), heavy metals, dioxins & furans, hydrogen chloride (HCl), sulphur-dioxide (SO₂), Carbon Monoxide (CO) and Hydrogen Fluorides (HF), to the levels for which the plant is licensed. Ammonia is sprayed into the boiler to reduce NO_x, activated carbon to bind dioxins and furans and mercury, and lime to reduce HCl, HF and SO₂ are injected into the gas stream and are subsequently retained in bag filters. A final scrubbing with water and Sodium Hydroxide (NaOH) takes out the remaining HCl, HF and SO₂.

25: Emission Monitoring

Emissions monitoring equipment will be provided to monitor the air pollutants. The monitoring system will meet the requirements of the Waste Incineration Directive, Irish implementing regulations and the Waste Licence. Monitoring results will be displayed locally.

Emissions monitoring will include the measurement of dioxin emissions from the stack on a fortnightly basis. A monitoring filter will be removed and analysed in an independent laboratory with the subsequent results being representative of dioxin emission concentrations for that period. It should be noted that such monitoring is not a requirement of EU or Irish legislation.

26: Stack

The stacks will be approximately 100m in height. This will be approximately half the height of the existing ESB-Poolbeg Stacks.

The facility is proposed to operate 24 hours, 7 days a week and it is proposed that it will accept deliveries between 8:00 AM and 10:00 PM Monday through Saturday, 312 days per year.

A.1.6 Determination of Section 40(4) of the Act

To comply with the requirements of the Waste Management Acts 1996 to 2003 as amended, the activity concerned must comply with Sections (a) to (i) of Section 40(4) of the Act.

These issues relate to compliance with emission standards, the avoidance of environmental pollution, application of BAT principles, the technical competence of and site management by the operator and the financial provisions made.

(a) Compliance with Emission Standards

Dublin City Council will ensure compliance with emission standards conditioned under Waste Licence by the EPA and the Waste Incineration Directive.

(b) Avoidance of Environmental Pollution

The Licence Application sets out control/monitoring procedures, which will ensure the Facility will not cause environmental pollution.

(c) Best Available Techniques (BAT)

The Facility will be designed and operated in accordance with BAT to reduce emissions from the Facility as far as is practicable which will include operation in accordance with the Waste Licence conditions and Waste Incineration Directive.

(cc) Consistency with Waste Management Plan

The need for the development of WtE capacity to serve the waste management needs of the Dublin Region was identified as far back as 1997 in the Dublin Waste Management Strategy. This document highlighted the need for the Region to develop integrated waste infrastructure to improve recycling rates and residual waste management. The adoption of the Dublin Waste Management Plan in 1998 formalised the region's policy direction and set out an objective to develop thermal capacity for municipal waste.

The need for the development of thermal treatment capacity in the Dublin Region was confirmed in the policy of the replacement Waste Management Plan for the Dublin Region published in November 2005.

(d) Technical Competence and Site Management

The Dublin City objective is to secure a private sector partner with the appropriate design, construction and operations experience to develop and operate the facility.

Dublin City as the applicant propose to subcontract the operational responsibility for the Facility to the private partner subject to confirmation of compliance with the requisite operational competences. It is not possible therefore at this stage to provide details of designated staff at the facility and Attachment C1 sets out competence requirements for the key staff.

(e) Financial Provisions

Section 40(4)(e) of the Waste Management Acts 1996 to 2003 requires compliance with any financial provision required by the EPA.

(f) Energy Efficiency

Section 40(4)(f) of the Waste Management Acts 1996 to 2003 requires that energy will be used efficiently in the carrying on of the activity concerned.

The facility will generate approximately 60MW of electricity for export to the national grid. This is enough electricity to power approximately 50,000 homes annually.

In accordance with the Best Available Techniques Reference Document (BREF) on Waste Incineration, the Dublin Waste to Energy Facility has been designed and optimised to achieve a very high overall energy efficiency and energy recovery, taking into account the techno-economic feasibility of the facility and the availability of users for the energy that is recovered.

(g) Noise Control

The noise and vibration modelling assessment shows that during operation, the facility will comply with relevant noise guidelines. During construction, noise and vibration will be generated from construction activities. Construction noise and vibration were considered in the modelling assessment and also found to comply with the relevant guidelines, with mitigation in place. Dublin City Council will ensure compliance with relevant emission standards.

A.1.7 Nature of Emissions at the Site

The emissions from the proposed facility will be: atmospheric, surface water, sewer and noise. Each of these individual emissions is considered in this licence application and supporting EIS attachments. The position with regard to each of the above emissions is summarised below:

Atmosphere

The main air emissions will be from the stacks and from the emergency generators exhaust. There will be also minor emission points from building ventilation.

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Control and abatement technology measures have been designed to secure full compliance with the requirements of the Waste Incineration Directive 2000/76/EEC which specifies limits on the emission of the following substances from incinerators:

- Oxides of Nitrogen (NO_x)
- Carbon Monoxide (CO)
- Particulates (Dust)
- PolyChlorinated Dibenzo Dioxins (PCDD)
- PolyChlorinated Dibenzo Furans (PCDF)
- Hydrocarbons (expressed as Total Organic Carbon (TOC))
- Sulphur Dioxide (SO₂)
- Hydrogen Chloride (HCl)
- Hydrogen Fluoride (HF)
- Heavy Metals - Antimony, Arsenic, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Thallium, Tin and Vanadium.

There will be no fugitive emissions from the delivery of process materials and removal of residues and ash as all such process will be conducted within the confines of the main building.

There will be no fugitive emissions from waste in the Reception Hall, as this area will be maintained under negative air pressure (ie air is sucked in rather than escaping). Therefore any potential fugitive emissions in this area will be drawn into the combustion plant, as part of the primary combustion air and will not escape to the atmosphere.

Air dispersion modelling results indicate that the background ground level concentrations of air pollutants, with the Facility in operation, will comply with the relevant air quality standards or guidelines for the protection of human health and vegetation.

Surface Water

Cooling water will be abstracted for use in the WtE Facility. Water will flow from the intake point in the port, through the condensers where it will be used to cool the steam after the turbine, and will return to the port through the outfall channel. The discharge temperature will be at higher temperature than the intake temperature and be at the point of the existing cooling water outfall channel.

All the surface water run-off from the roofs of the buildings and from the roads, parking areas and capped landscape areas will be collected and stored in the rainwater storage tank in order to enable use of the collected rainwater in the facility process. The rainwater storage tank will be provided with an overflow connection to the main combined sewer pipeline.

Sewer

Sanitary effluent from the facility will be generated from the sanitary installations in the kitchens, toilets, floor drains and showers in the administration area and will be discharged to the existing main Storm Water and Foul Sewer in Pigeon House Road

There will be no discharge of process wastewater from the facility. All process wastewaters from the WtE Facility will be collected for use in the process. Wash water will be discharged to the floor drains in the boiler house, etc. will also be collected and used in the process water system.

Groundwater

There will be no emissions to groundwater from the Dublin WtE Facility.

Noise

The existing noise and vibration levels were measured at the site boundary and at the nearest noise sensitive locations. The noise and vibration assessment shows that during operation, the facility will comply with all relevant guidelines.

During construction, noise and vibration will be generated from construction activities. Construction noise and vibration were considered in the assessment and also found to comply with the relevant guidelines, with mitigation in place.

A.1.8 Assessment of Environmental Impacts

The potential impacts of the proposed Facility on the surrounding environment are detailed in Volume 2, of the EIS. Impacts have been described and assessed under the following headings.

- Landscape and Visual
- Traffic and Transportation
- Air Quality and Climate
- Noise and Vibration
- Residues and Consumables
- Soils, Geology and Groundwater
- Water
- Human Beings
- Terrestrial Ecology
- Estuarine Ecology
- Archaeology, Architecture and Cultural Heritage
- Material Assets

A.1.9 Monitoring and Sampling Arrangements

All environmental monitoring will be carried out according to frequencies and analysis methods specified in the Waste Licence and the Waste Incineration Directive. A nominated competent person, who sanctions appropriate measures to mitigate any problems identified, will assess all monitoring data.

A.1.10 Prevention, Minimisation and Recovery of Waste and Off Site Disposal Arrangements

Ash and residues will be generated during the WtE process. There will be three main solid residues:

- a) Bottom ash
- b) Boiler ash
- c) Flue gas treatment residues

The types and approximate quantities of ash and residues from treating 600,000 tonnes of waste are detailed in the Table 1 below.

Table 1 Estimated Ash and Residues by Type and Quantity

Ash Type	Tonnes/annum
Bottom Ash	120,000
Boiler Ash	3,000
Flue Gas Treatment Residues	24,000
Total	147,000

Bottom ash is what remains at the end of the grate after the burnout of the waste. Bottom ash is classified as non-hazardous. Bottom ash will be stored onsite in the bottom ash bunker. Until the framework for re-use of bottom ash develops in Ireland, the bottom ash will be exported by ship for recycling and reuse in the UK or Continental Europe.

Boiler ash is contained in the flue gases from the combustion process and accumulates in the boiler. Depending on its content, the boiler ash will either be stored with the bottom ash (if non-hazardous) or with the flue gas treatment residues (if hazardous), prior to removal offsite for either re-use or disposal overseas.

Flue gas treatment residues are the residues removed from the flue gases in the treatment processes. Flue gas treatment residues will be collected and stored in an enclosed system. The flue gas treatment residue, due to its composition, will be classified as hazardous for transportation and disposal. The residue will be transported offsite in sealed containers and will be shipped to Europe.

There will be no emissions from the ash and residue handling operations during normal conditions. The residues handling, storage and loading areas will be enclosed to prevent the potential for windblown ash.

No treatment of any ash or residue will take place onsite.

A.1.11 Emergency Procedures

Measures will be put in place to ensure the safety and well being of all staff, the community and the receiving environment. An "Emergency Procedure Strategy" or "EPS", incorporating requirements and procedures identified in the Hazard and Operability Study (HAZOP) will be prepared. The EPS shall ensure that resources are available to respond to emergencies at all times during the operational period and that suitably qualified personnel will be available at all times to manage the response of the emergencies.

A.1.12 Closure, Restoration and Aftercare Measures

The provisions, which will be put in place, to minimise the impact on the environment following the cessation of the activity and any post closure care are described below.

Decommissioning

The Dublin Waste to Energy facility has a projected life span of at least 30 years, though this may be extended through maintenance or renewal of equipment and systems. Should circumstances arise whereby it becomes necessary to shut down the facility, the applicant will implement a decommissioning programme to ensure that any negative environmental impact is minimised.

This programme will include:

- Removal of any chemicals or wastes stored on site. Any oils, lubricants or fuels that are on site at the time of closure will be recycled/disposed of through appropriate registered contractors.
- Equipment and machinery will be emptied on ceasing operations, dismantled and stored under suitable conditions until sold, or if a suitable buyer cannot be located, recycled/disposed of through appropriate licensed waste disposal contractors.
- The site and buildings will be left in a secure manner and appropriate security maintained on site in the event of the site potentially being vacant for an extended period of time.
- If the buildings cannot be reused, the structures will be demolished and disposed of or recycled through appropriate licensed waste disposal contractors. The site will be returned to its present state.
- There will be no asbestos used in the construction of the facility so its removal during decommissioning will not arise.

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The main impact from the decommissioning phase will be the generation of waste. Relatively small quantities of waste will arise from the site and equipment cleaning phase of the decommissioning plan. If a reuse option cannot be found for the plant and buildings their constituent materials will also be waste. The materials arising in this situation will be recycled if feasible.

Post Closure Care

When the facility is decommissioned all materials will be removed from the facility. There will be no emissions from the facility after cessation of the activity. No post closure care management plan will be required.

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