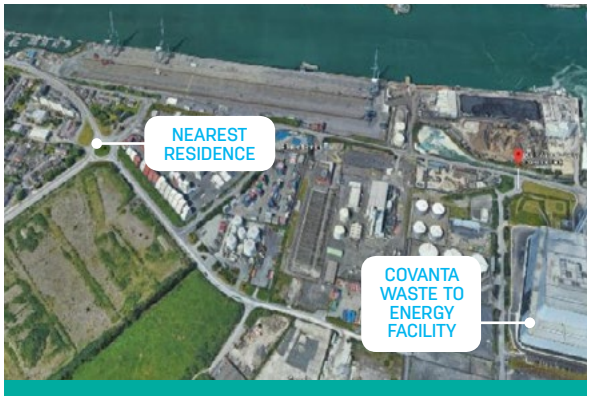
CASE STUDY *The Dublin Energy from Waste facility, Ireland*

This is one of many case studies similar to the Western Sydney Energy and Resource Recovery Centre proposal.

The Dublin Energy from Waste facility operated by Covanta started construction in 2014. It was funded by a public private partnership with Dublin City Council.

It has been operating at full capacity since December 2017. The facility takes waste that cannot be reused or recycled and recovers energy from these materials to generate electricity. This provides a long-term, environmentally responsible waste management solution.



The site, located on Pigeon House road, Dublin, is located less than 3 kilometres from Dublin City Centre, in the Docklands area of Dublin City, close to the mouth of Dublin Port.

Proximity to residential areas

The nearest residential area is Stella Gardens, Irishtown, 1.3 kilometres away. Irishtown is an inner-city suburb close to Dublin City, with historic public housing and modern apartments. The former Irish Glass bottle site, less than 1 kilometre from the site, will soon house 3,000 residential units.

How does the community benefit?

Covanta makes a positive contribution to the community. During construction over 300 jobs were created with more than 50 from the local area. Over 100 positions operate the facility.

Through community-based programs, the centre works with a variety of organizations on local environmental issues. The facility-run initiatives enlist volunteers to help clean up rivers, streets and parks. Also at a local level, the centre supports food pantries, recycling programs, and sports teams.

What sort of waste is managed?

The facility converts thousands of tonnes of residual household and business waste into energy, which otherwise would have gone to landfill.

Each year over 600,000 tonnes of waste is combusted, reducing the volume of waste to landfill by 90%.

What happens on site?

When the waste arrives, it is weighed, mixed and maintained in a storage pit under negative air pressure (this means waste odours cannot leak out).

The combustion process produces steam to create electricity using a turbine generator on site.

The ash and metal products remain at the end of the combustion process. The metals are extracted and recycled, and the final ash is transported for disposal.

Key Statistics:

Material being processed

Municipal and business solid waste.

Waste management capacity

600,000

tonnes per year

Energy produced

60 MW of continuous energy produced providing electricity for

80,000 homes

and can heat up to 50,000 homes

Reporting of emissions data

Emissions are measured and recorded continuously, with results automatically posted to the website in real time (see next page).

Meeting European standards

The facility is licensed by the Environmental Protection Agency under the Industrial Emissions Directive (IED).

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How is air quality measured?

The facility is designed to do better than the EU emissions standards for waste incineration.

The Ireland Environmental Protection Agency's (EPA's) public reporting requirements ensure the facility's performance data is easily accessible.

Air emission levels are measured and recorded by a continuous emissions monitoring system. The data is collected from inside the air stack, which is then published on the Covanta Dublin website

What data?

The raw data is published on the Covanta Dublin website in real time, providing the public with constant updates on air quality. This is important - it means people can see the information quickly.

This data is then checked and verified, with some alterations where, for example, something has been incorrect.

Many of the in-stack air measurements cannot be measured in real time and are tested periodically, with the results then published.

The air pollution control system uses the best available technology.

Water management at the facility

The facility operates on a completely waste water-free basis.

Most of the water used in the centre comes from rain water.

The facility is adjacent to a water treatment plant which also provides the water needed for operations.

How do emissions from this facility perform?

The centre successfully operates according to all EU air quality standards. Air emission levels are measured by the facility's Distributed Control System.

This includes readings from both stacks for:

- Total dust
- Hydrogen Chloride
- Carbon Monoxide
- Sulphur Dioxide and Oxides
- Nitrogen oxides
- Gaseous and vaporous organic substances expressed as Total Organic Carbon

A weekly emissions table is published showing the daily averages from the continuous monitoring of various substances. Following are examples of reporting found at www.dublinwastetoenergy.ie/About-the-facility/emissions-data.

Boiler One

MEASURED EMISSION	TOTAL DUST	TOC	HCL	SO2	CO	NOX
Limit	10	10	10	50	50	200
Unit	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3
17 April 2019	0.34	0.15	0.04	0.01	7.17	127.00
18 April 2019	0.40	0.50	0.07	0.43	11.20	116.43
19 April 2019	0.35	0.16	0.04	0.15	7.08	120.24
20 April 2019	0.32	0.22	0.04	0.15	7.39	124.57
21 April 2019	0.32	0.20	0.05	0.50	7.26	122.76

Boiler Two

MEASURED EMISSION	TOTAL DUST	TOC	HCL	SO2	CO	NOX
Limit	10	10	10	50	50	200
Unit	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3
17 April 2019	0.34	0.18	0.06	1.79	5.83	117.07
18 April 2019	0.33	0.22	0.13	0.90	5.49	107.29
19 April 2019	0.30	0.21	0.11	0.33	5.07	110.68
20 April 2019	0.30	0.21	0.09	0.37	5.19	113.54
21 April 2019	0.31	0.20	0.11	1.20	4.85	116.06

Cleaning the gases

The waste is stored under negative pressure to capture any odours. This means that air does not exit the centre, it is drawn into the centre. The waste is fed into the combustion process that also destroys odours.

The flue gas that is produced during the combustion process is cleaned. This is a three step process as described below.

Step One:

The flue gas is fed into the SemiDry reactor at a temperature of around 170°C. It is injected with dry hydrated lime, water and activated carbon. The particles of calcium hydroxide react with the pollutants in the flue gas. This creates particulate matter that is removed in step 2. The activated carbon neutralizes traces of mercury and dioxins or furans.

Step Two:

Particulate matter is removed by passing the flue gas through a bag house filter.

Step Three:

Water is used in a wet scrubber to reduce the flue gas temperature. This absorbs and neutralizes the remaining acid gases, before the scrubbed gas is released into the atmosphere.

All steps of this process are safe and are continuously monitored by operators working in the control room.

99.99% of the gas volume leaving the stack are gases common to air, including oxygen, hydrogen, nitrogen and water vapour.