

WASTE INCINERATION DIRECTIVE

Guidance on the requirements of the Waste Incineration Directive and the implications for waste wood biomass and small scale energy from waste projects

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INTRODUCTION

The Waste Incineration Directive (WID) looks to achieve significant levels of environmental and human health protection by setting very strict operational and technical limit values within which facilities are not only required to operate but to demonstrate their compliance through verification testing and sampling. This is designed to ensure that thermal treatment and waste to energy facilities across the European Community are operating within the same operational and technical constraints, assisting understanding not only for Operators but for Regulators as well.

WID was recast within the Industrial Emissions Directive (IED) in December 2010, but is not required to be transposed into UK law until January 2013. Defra consulted on the required changes to the Environmental Permitting (England and Wales) Regulations 2010 (EPR) that the implementation of the IED will bring about, including changes to the permitted emission limit values for emissions to air.

The structure of the guidance relating to WID and IED is set out below and aims to give you an understanding of what each of the directives' main aims and objectives are with reference to thermal treatment activities:

- **Waste Incineration Directive**
Guidance relating to what the directive is, what's covered, terminology and when it applies.
- **Process control**
Guidance relating to the full process involved at the facility, the use of raw materials on site and interactions with other legislation.
- **Commissioning**
Guidance relating to how the commissioning of the facility and directives work together.
- **Operation**
Guidance relating to how the directives work during the operation of the EfW facility.
- **Wood Waste**
There are exemptions within WID and the IED on the types of wood waste that can be burnt before these Directives apply. This section provides guidance relating to the types of wood that fall within and outside of WID and IED.
- **Industrial Emissions Directive**
Guidance relating to what the directive is, what changes from WID to IED and when it applies.
- **Further information**
Signposts to further useful information and guidance.

1.0 THE WASTE INCINERATION DIRECTIVE 2000/76/EC

The aim of the Waste Incineration Directive (WID) is to prevent or limit, as far as practicable, any negative effects on the environment. In particular it relates to the pollution of air, soil, surface and groundwater and the resulting risk to human health by emissions from the thermal treatment of waste¹. It looks to achieve significant levels of environmental and human health protection by setting strict operational and technical requirements which will enable the implementation of emission limit values for facilities throughout Europe.

WID was first implemented in the EU in 2000 and imposed stringent requirements on incineration and co-incineration plants within its scope. These requirements covered a range of technical and operational aspects including types of waste permitted at plants, their delivery mechanisms, design of combustion furnaces, abatement plant, residue handling, monitoring equipment and emission limit values².

WID also required that the above be included within the facility's operational permit, and although the majority of WID facilities will be covered by Environmental Permits³, some facilities will be covered by Local Authority Permits. Such facilities are not subject to the requirements of WID.

1.1 What is contained within the WID ?

The operational and technical requirements introduced by the WID covered a range of aspects as identified above.

The most relevant requirements relate to the introduction of emission limit values for facilities applying to thermally treat wastes. WID introduced maximum emission levels for emissions to air of the most polluting and environmentally harmful parameters generated during the thermal degradation of wastes.

¹ The 'thermal treatment of waste' is used here to describe the chemical conversion of all wastes by thermal treatments including gasification, pyrolysis and incineration. See [Appendix 1](#) for full definition.

² See [Appendix 2](#) for full list of emission limit values

³ See WRAP Guidance on [Environmental Permitting Regulations](#)

These limits included both daily and half hourly limit values for the following parameters:

- total dust/particulates;
- total organic carbon;
- hydrogen chloride;
- hydrogen fluoride;
- heavy metals;
- dioxins;
- sulphur dioxide; and
- nitrogen dioxide.

As such, WID facilities are required to have flue gas cleaning plants to 'scrub' the gases generated and reduce emissions of the above parameters as far as practically possible. Such systems must be detailed within the EP application process and supported by a technical review of the systems selected on a site by site basis.

Further to the above, WID introduced minimum requirements for combustion conditions at such facilities, including a requirement for combustion gases to be heated to 850°C⁴ for a minimum of 2 seconds in the secondary combustion chamber to ensure complete combustion of all potentially polluting substances. Such technical standards are also required to be verified through on site testing/analysis and reported back to the Environment Agency (EA).

⁴ 850°C for non-hazardous waste, 1150°C for hazardous wastes

1.2 When does WID apply to thermal treatment plants?

WID applies to almost all processes that burn/incinerate wastes and generate direct emissions to air from the burning process. Therefore, for advanced thermal treatment (such as pyrolysis and gasification) WID will only apply where the purpose of the process is the disposal of materials and the combustion of resultant gases (rather than the production of vehicle fuel, for instance).

The EA note that European case law and Commission positions continue to develop on the distinction between the incineration of waste and the use of waste as a fuel for energy for the purposes (“recovery”) of the Waste Framework Directive.

There are, however, some notable exclusions from WID under Article 2 for plants treating only the following wastes:

- vegetable waste from agriculture and forestry;
- vegetable waste from the food processing industry, if the heat generated is recovered;
- fibrous vegetable waste from virgin pulp production and from production of paper from pulp, if it is co-incinerated at the place of production and the heat generated is recovered;
- wood waste, with the exception of wood waste which may contain halogenated organic compounds or heavy metals as a result of treatment with wood preservatives or coating, and which includes in particular such wood waste originating from construction and demolition waste;
- cork waste;
- radioactive waste;
- animal carcasses as regulated by Directive 90/667/EEC without prejudice to its future amendments; and
- waste resulting from the exploration for, and the exploitation of, oil and gas resources from off-shore installations and incinerated on board the installation.

1.3 Wood Waste & WID Compliance

A specific section of WID covers wood waste (Article 2(2)(a)(iv)). In general, plants burning ‘clean’ wood waste (containing no evidence of chemical treatments/paints) would be excluded from the requirements of WID, but the utilisation of ‘treated’ wood wastes (containing treatments or chemicals, either from product manufacture or through usage through the wood’s lifetime) would require WID compliance.

In order to use wood waste as a fuel in a plant not operated to WID technical standards, it would have to be demonstrated that the wood waste wasn’t treated. If the wood waste contains halogenated organic compounds or heavy metals as a result of treatment with wood preservatives or coatings, in particular wood originating from construction and demolition sites, then it will fall under the requirements of WID.

2.0 THE INDUSTRIAL EMISSIONS DIRECTIVE (IED) 2010/75/EU

The Waste Incineration Directive (WID) as described above has been recast within the Industrial Emissions Directive (IED) as of December 2010. The purpose of this was to transpose several pre-existing directives on the control of emissions from industrial processes into one directive on industrial emissions.

The IED was introduced into European law when it was published in the Official Journal of the European Community in December 2010 but is not required to be transposed into UK law until 6th January 2013. Defra recently consulted on the implementation of the IED in England and Wales and are proposing to introduce the IED through a recast of the Environmental Permitting (England and Wales) Regulations 2010 in January 2013.

The consultation on the implementation of the IED stated that there will be minimal changes to the requirements of the WID in the IED. However, Article 42(1) of the IED removes the waste incineration provisions from gasification and pyrolysis plants “if the gases resulting from this thermal treatment of waste are purified to such an extent that they are no longer a waste prior to their incineration and they can cause emissions no higher than those resulting from the burning of natural gas”.



APPENDIX 1 – INCINERATION DEFINITION

The WID makes specific reference to facilities for the incineration and co-incineration of wastes and provides the following definitions for these terms in Article 3:

“Incineration plant means any stationary or mobile technical unit and equipment dedicated to the thermal treatment of waste with or without recovery of the combustion heat generated. This includes the incineration by oxidation of waste, as well as other thermal treatment processes such as pyrolysis, gasification or plasma processes insofar as the substances resulting from the treatment are subsequently incinerated.”

It goes on to state:

“This definition covers the site and the entire incineration plant including all incineration, waste reception, storage, on site pre-treatment facilities, waste-fuel and air supply systems, boiler, facilities for the treatment of exhaust gases, on-site facilities for treatment or storage of residues and waste water, stack, devices and systems for controlling incineration operations, recording and monitoring incineration conditions.”

Co-incineration is defined as:

“any stationary or mobile plant whose main purpose is the generation of energy or production of material products and:

- *which uses waste as a regular or additional fuel; or*
- *in which waste is thermally treated for the purpose of disposal.”*

It can therefore be determined that references within WID, and therefore this guidance note, to incineration and co-incineration refer to all complex thermal treatment (EfW) processes not necessarily considered as traditional incineration or co-incineration technologies.

Further to the above, it is noted that not all thermal treatment technologies are considered to combust materials, particularly if thermal treatment is carried out in the presence of oxygen.

However, WID and most other thermal treatment guidance notes refer to combustion processes when describing the thermal breakdown of waste and as such this definition will also be adopted within this guidance.

APPENDIX 2 – DAILY EMISSION LIMIT VALUES

Parameter	Unit	WID (Annex V)
Total dust	mg/Nm ³	10
HCl	mg/Nm ³	10
TOC	mg/Nm ³	10
CO	mg/Nm ³	50
HF	mg/Nm ³	1
SO ₂ and SO ₃	mg/Nm ³	50
NO _x	mg/Nm ³	200
Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V	mg/Nm ³	0.5
Hg	mg/Nm ³	0.05
Cd and Tl	mg/Nm ³	0.05
Dioxins and furans	ng/Nm ³	0.1

APPENDIX 3 – WHEN DOES WID APPLY ?

Page 13 - <http://www.defra.gov.uk/publications/files/pb13639-ep2010wasteincineration.pdf>

**For further information about
Energy from Waste please visit:
www.wrap.org.uk/EfW**

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