

Liability of BREF/BAT-Documents for Waste Incineration

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1. Introduction

The Best Available Techniques Reference Documents (BREFs) are a main point for the technical activities on environmental protection in Europe and therefore it will be shown which effects on national transposition of the BREF documents will be caused by the Directive 2010/75/EU on industrial emissions (IED) of 24 November 2010. Main aspects of the process are the higher liability of the BAT documents, exchange of information on BAT in Europe as a continuous and dynamic process and the national transition and control of BAT conclusions.

The IED is more than only a recast of the IPPC Directive because several European Directives were put together and the liabilities of the BAT documents are strengthened. Taking the BAT document on waste incineration into account you will see that like other industrial sectors there is no BREF on basis of IED because the work was done under IPPC conditions and without adoption through committee procedure it will not get automatically a higher liability. But looking on actual discussion of the BREF on waste incineration it seems that there will not be major changes on BAT conclusions based on IED. But there is still discussion if the more *qualitative* conclusions on measures for building, organization and operation will be adopted under IED in the same way as the more *quantitative* conclusions like emission values. Taking the reasons for considerations on IED into account, the definition of best available techniques combined with the reference documents for best available techniques and their liability are one of the main reasons for the recast of the IPPC. Therefore it makes sense to look closer on the reasons for consideration and the changes they cause for the revision of the BREF on waste incineration and its use in permitting procedures.

2. BREF/BAT activities based on the background of European Directive on Industrial Emission (IED)

The BAT documents and their use during the permitting process and control of industrial activities will become a central part of the national execution by the competent authorities if the reason of consideration for IED will be taken into account. Even the exact wording of several articles will bind the national authorities in a closer way. One of the main targets is to base permitting conditions on best available techniques.

The permit should include all the measures necessary to achieve a high level of protection of the environment as a whole and to ensure that the installation is operated in accordance with the general principles governing the basic obligations of the operator. The permit should also include emission limit values for polluting substances, or equivalent parameters or technical measures, appropriate requirements to protect the soil and groundwater and monitoring requirements. Permit conditions should be set on the basis of best available techniques (Consideration 12).

The BAT process is a central way to get more uniformity between the European Member States and becomes a more importance for EU 27.

In order to determine best available techniques and to limit imbalances in the Union as regards the level of emissions from industrial activities, reference documents for best available techniques (hereinafter BAT reference documents') should be drawn up, reviewed and, where necessary, updated through an exchange of information with stakeholders and the key elements of BAT reference documents (hereinafter BAT conclusions') adopted through committee procedure. In this respect, the Commission should, through committee procedure, establish guidance on the collection of data, on the elaboration of BAT reference documents and on their quality assurance. BAT conclusions should be the reference for setting permit conditions. They can be supplemented by other sources. The Commission should aim to update BAT reference documents not later than 8 years after the publication of the previous version (Consideration 13). Commission has the duty and at the same time creates the instrument to produce an actual version of BAT documents. A central role in the process is given to the Information Exchange Forum (IEF) which has local focal points as national counterparts.

In order to ensure an effective and active exchange of information resulting in high-quality BAT reference documents, the Commission should establish a forum that functions in a transparent manner. Practical arrangements for the exchange of information and the accessibility of BAT reference documents should be laid down, in particular to ensure that Member States and stakeholders provide data of sufficient quality and quantity based on established guidance to enable the determination of best available techniques and emerging techniques (Consideration 14).

Even the Commission sees the problems which caused by different national implementation in the Member States and the setting of emissions values, so consideration 15 give more flexibility to national authorities but still causes effects on the liability of the BAT documents.

So it is considered to provide sufficient flexibility to competent authorities to set emission limit values that ensure that, under normal operating conditions, emissions do not exceed the emission levels associated with the best available techniques. To this end, the competent authority may set emission limits that differ from the emission levels associated with the best available techniques in terms of the values, periods of time and reference conditions applied, so long as it can be demonstrated, through the results of emission monitoring, that emissions have not exceeded the emission levels associated with the best available

techniques. Compliance with the emission limit values that are set in permits results in emissions below those emission limit values.

The specific requirements which will be discussed later can be found in article 15 of the IED and give an idea of the problems between emission levels associated with the best available techniques and emission values.

One main point during the discussion on IED in Brussels was the question about costs which are linked to the use of the best available techniques.

Consideration 16 gives only an idea and the competent authorities will have some problems to take this in consideration.

In order to take into account certain specific circumstances where the application of emission levels associated with the best available techniques would lead to disproportionately high costs compared to the environmental benefits, competent authorities should be able to set emission limit values deviating from those levels. Such deviations should be based on an assessment taking into account well-defined criteria. The emission limit values set out in this Directive should not be exceeded. In any event, no significant pollution should be caused and a high level of protection of the environment taken as a whole should be achieved. Even this wording shows the problem which is linked to this question and is also part of article 15 of the IED.

Not easy to handle are emerging technologies and in order to enable operators to test emerging techniques which could provide for a higher general level of environmental protection, or at least the same level of environmental protection and higher cost savings than existing best available techniques, the competent authority should be able to grant temporary derogations from emission levels associated with the best available techniques (Consideration 17).

Consideration 21 and 22 give an idea about the timetable which is linked to the BREF process. In order to take account of developments in best available techniques or other changes to an installation, permit conditions should be reconsidered regularly and, where necessary, updated, in particular where new or updated BAT conclusions are adopted. In specific cases where permit reconsideration and updating identifies that a longer period than 4 years after the publication of a decision on BAT conclusions might be needed to introduce new best available techniques, competent authorities may set a longer time period in permit conditions where this is justified on the basis of the criteria laid down in this Directive.

Dealing with toxic emissions the Commission will set the standards. In consideration 41 is laid down that in order to address significant environmental pollution, for example from heavy metals and dioxins and furans, the Commission should, based on an assessment of the implementation of the best available techniques by certain activities or of the impact of those activities on the environment as a whole, present proposals for Union-wide minimum requirements for emission limit values and for rules on monitoring and compliance.

3. The legal basis of BREF/BAT activities in European Directive on Industrial Emission

For getting closer into the legislative concept connected to the BREF activities it might be helpful to have a brief look on the definitions given in IED:

- **best available techniques** means the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other

permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole;

- **techniques** includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned;
- **available techniques** means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator;
- **best** means most effective in achieving a high general level of protection of the environment as a whole;
- **BAT reference document** means a document, resulting from the exchange of information organised pursuant to Article 13, drawn up for defined activities and describing, in particular, applied techniques, present emissions and consumption levels, techniques considered for the determination of best available techniques as well as BAT conclusions and any emerging techniques, giving special consideration to the criteria listed in Annex III;
- **BAT conclusions** means a document containing the parts of a BAT reference document laying down the conclusions on best available techniques, their description, information to assess their applicability, the emission levels associated with the best available techniques, associated monitoring, associated consumption levels and, where appropriate, relevant site remediation measures;
- **emission levels associated with the best available techniques** means the range of emission levels obtained under normal operating conditions using a best available technique or a combination of best available techniques, as described in BAT conclusions, expressed as an average over a given period of time, under specified reference conditions;
- **emerging technique** means a novel technique for an industrial activity that, if commercially developed, could provide either a higher general level of protection of the environment or at least the same level of protection of the environment and higher cost savings than existing best available techniques; a **definition** which might cause scientific problem from the view of an civil engineer because linked to article 15 for the chance of lower costs higher emissions will be allowed for a certain period. Most of the *new or emerging techniques* are advertised with the arguments of lower costs but often they do not fulfil these promises and therefore they have no future.

In Article 13 the IED deals with **BAT reference documents and exchange of information** and describes the technical and organisational aspects of the BAT process:

1. In order to draw up, review and, where necessary, update BAT reference documents, the Commission shall organize an exchange of information between Member States, the industries concerned, non-governmental organizations promoting environmental protection and the Commission.
2. The exchange of information shall, in particular, address the following:
 - (a) the performance of installations and techniques in terms of emissions, expressed as short- and long-term averages, where appropriate, and the associated reference conditions, consumption and nature of raw materials, water consumption, use of energy and generation of waste;

- (b) the techniques used, associated monitoring, cross-media effects, economic and technical viability and developments therein;
- (c) best available techniques and emerging techniques identified after considering the issues mentioned in points (a) and (b).

3. The Commission shall establish and regularly convene a forum composed of representatives of Member States, the industries concerned and non-governmental organizations promoting environmental protection.

The Commission shall obtain the opinion of the forum on the practical arrangements for the exchange of information and, in particular, on the following:

- (a) the rules of procedure of the forum;
- (b) the work program for the exchange of information;
- (c) guidance on the collection of data;
- (d) guidance on the drawing up of BAT reference documents and on their quality assurance including the suitability of their content and format.

The guidance referred to in points (c) and (d) of the second subparagraph shall take account of the opinion of the forum and shall be adopted in accordance with the regulatory procedure referred to in Article 75(2).

- 4. The Commission shall obtain and make publicly available the opinion of the forum on the proposed content of the BAT reference documents and shall take into account this opinion for the procedures laid down in paragraph 5.
- 5. Decisions on the BAT conclusions shall be adopted in accordance with the regulatory procedure referred to in Article 75(2).
- 6. After the adoption of a decision in accordance with paragraph 5, the Commission shall without delay make the BAT reference document publicly available and ensure that BAT conclusions are made available in all the official languages of the Union.
- 7. Pending the adoption of a relevant decision in accordance with paragraph 5, the conclusions on best available techniques from BAT reference documents adopted by the Commission prior to the date referred to in Article 83 shall apply as BAT conclusions for the purposes of this Chapter except for Article 15(3) and (4).

One central element for a higher liability of BAT documents in IED is Article 14 which describes the **Permit conditions**:

- 1. Member States shall ensure that the permit includes all measures necessary for compliance with the requirements of Articles 11 and 18.

Those measures shall include at least the following:

- (a) emission limit values for polluting substances listed in Annex II, and for other polluting substances, which are likely to be emitted from the installation concerned in significant quantities, having regard to their nature and their potential to transfer pollution from one medium to another;
- (b) appropriated requirements ensuring protection of the soil and groundwater and measures concerning the monitoring and management of waste generated by the installation;

- (c) suitable emission monitoring requirements specifying:
 - measurement methodology, frequency and evaluation procedure; and
 - where Article 15(3)(b) is applied, that results of emission monitoring are available for the same periods of time and reference conditions as for the emission levels associated with the best available techniques;
 - (d) an obligation to supply the competent authority regularly, and at least annually,
 - information on the basis of results of emission monitoring referred to in point (c) and other required data that enables the competent authority to verify compliance with the permit conditions; and
 - where Article 15(3)(b) is applied, a summary of the results of emission monitoring which allows a comparison with the emission levels associated with the best available techniques;
2. For the purpose of paragraph 1(a), emission limit values may be supplemented or replaced by equivalent parameters or technical measures ensuring an equivalent level of environmental protection.
 3. BAT conclusions shall be the reference for setting the permit conditions.
 4. Without prejudice to Article 18, the competent authority may set stricter permit conditions than those achievable by the use of the best available techniques as described in the BAT conclusions. Member States may establish rules under which the competent authority may set such stricter conditions.
 5. Where the competent authority sets permit conditions on the basis of a best available technique not described in any of the relevant BAT conclusions, it shall ensure that:
 - (a) that technique is determined by giving special consideration to the criteria listed in Annex III; and
 - (b) the requirements of Article 15 are complied with.

Where the BAT conclusions referred to in the first subparagraph do not contain emission levels associated with the best available techniques, the competent authority shall ensure that the technique referred to in the first subparagraph ensures a level of environmental protection equivalent to the best available techniques described in the BAT conclusions.

6. Where an activity or a type of production process carried out within an installation is not covered by any of the BAT conclusions or where those conclusions do not address all the potential environmental effects of the activity or process, the competent authority shall, after prior consultations with the operator, set the permit conditions on the basis of the best available techniques that it has determined for the activities or processes concerned, by giving special consideration to the criteria listed in Annex III.7.

For installations referred to in point 6.6 of Annex I, paragraphs 1 to 6 of this Article shall apply without prejudice to the legislation relating to animal welfare.

With Article 15 **Emission limit values, equivalent parameters and technical measures** Commission has a massive influence on national regulations but is pushed back in paragraph 4 and leaves the basis common EU concept. Thus Article 15 defines that:

1. The emission limit values for polluting substances shall apply at the point where the emissions leave the installation, and any dilution prior to that point shall be disregarded when determining those values. With regard to indirect releases of polluting substances

into water, the effect of a water treatment plant may be taken into account when determining the emission limit values of the installation concerned, provided that an equivalent level of protection of the environment as a whole is guaranteed and provided this does not lead to higher levels of pollution in the environment.

2. Without prejudice to Article 18, the emission limit values and the equivalent parameters and technical measures referred to in Article 14(1) and (2) shall be based on the best available techniques, without prescribing the use of any technique or specific technology.
3. The competent authority shall set emission limit values that ensure that, under normal operating conditions, emissions do not exceed the emission levels associated with the best available techniques as laid down in the decisions on BAT conclusions referred to in Article 13(5) through either of the following:
 - (a) setting emission limit values that do not exceed the emission levels associated with the best available techniques. Those emission limit values shall be expressed for the same or shorter periods of time and under the same reference conditions as those emission levels associated with the best available techniques; or
 - (b) setting different emission limit values than those referred to under point (a) in terms of values, periods of time and reference conditions.

Where point (b) is applied, the competent authority shall, at least annually, assess the results of emission monitoring in order to ensure that emissions under normal operating conditions have not exceeded the emission levels associated with the best available techniques.

4. By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:
 - (a) the geographical location or the local environmental conditions of the installation concerned; or
 - (b) the technical characteristics of the installation concerned.

The competent authority shall document in an annex to the permit conditions the reasons for the application of the first subparagraph including the result of the assessment and the justification for the conditions imposed.

The emission limit values set in accordance with the first subparagraph shall, however, not exceed the emission limit values set out in the Annexes to this Directive, where applicable.

The competent authority shall in any case ensure that no significant pollution is caused and that a high level of protection of the environment as a whole is achieved. Paragraph 4 and 5 were criticized before because instead of a higher level these paragraph might cause a lower emission level depending on the information available for the local authorities.

To reduce this risk Article 19 sets standards for **Developments in best available techniques**:

Member States shall ensure that the competent authority follows or is informed of developments in best available techniques and of the publication of any new or updated BAT conclusions and shall make that information available to the public concerned.

It's the question if the competent authorities are well informed by documents prepared in English and fulfil the recommendations of Article 21 for **Reconsideration and updating of permit conditions by the competent authority**:

1. Member States shall take the necessary measures to ensure that the competent authority periodically reconsiders in accordance with paragraphs 2 to 5 all permit conditions and, where necessary to ensure compliance with this Directive, updates those conditions.
2. At the request of the competent authority, the operator shall submit all the information necessary for the purpose of reconsidering the permit conditions, including, in particular, results of emission monitoring and other data, that enables a comparison of the operation of the installation with the best available techniques described in the applicable BAT conclusions and with the emission levels associated with the best available techniques.

When reconsidering permit conditions, the competent authority shall use any information resulting from monitoring or inspections.

3. Within 4 years of publication of decisions on BAT conclusions in accordance with Article 13(5) relating to the main activity of an installation, the competent authority shall ensure that:
 - (a) all the permit conditions for the installation concerned are reconsidered and, if necessary, updated to ensure compliance with this Directive, in particular, with Article 15(3) and (4), where applicable;
 - (b) the installation complies with those permit conditions.

The reconsideration shall take into account all the new or updated BAT conclusions applicable to the installation and adopted in accordance with Article 13(5) since the permit was granted or last reconsidered.

4. Where an installation is not covered by any of the BAT conclusions, the permit conditions shall be reconsidered and, if necessary, updated where developments in the best available techniques allow for the significant reduction of emissions.
5. The permit conditions shall be reconsidered and, where necessary, updated at least in the following cases:
 - (a) the pollution caused by the installation is of such significance that the existing emission limit values of the permit need to be revised or new such values need to be included in the permit;
 - (b) the operational safety requires other techniques to be used;
 - (c) where it is necessary to comply with a new or revised environmental quality standard in accordance with Article 18.

Another central scenario is the participation of the public with its different view on what is defined as best available techniques. Article 24 **Access to information and public participation in the permit procedure** can lead to very different discussions between the competent authorities and the affected public:

1. Member States shall ensure that the public concerned are given early and effective opportunities to participate in the following procedures:
 - (a) the granting of a permit for new installations;
 - (b) the granting of a permit for any substantial change;

- (c) the granting or updating of a permit for an installation where the application of Article 15(4) is proposed;
- (d) the updating of a permit or permit conditions for an installation in accordance with Article 21(5)(a).

The procedure set out in Annex IV shall apply to such participation.

2. When a decision on granting, reconsideration or updating of a permit has been taken, the competent authority shall make available to the public, including via the Internet in relation to points (a), (b) and (f), the following information:
 - (a) the content of the decision, including a copy of the permit and any subsequent updates;
 - (b) the reasons on which the decision is based;
 - (c) the results of the consultations held before the decision was taken and an explanation of how they were taken into account in that decision;
 - (d) the title of the BAT reference documents relevant to the installation or activity concerned;
 - (e) how the permit conditions referred to in Article 14, including the emission limit values, have been determined in relation to the best available techniques and emission levels associated with the best available techniques;
 - (f) where a derogation is granted in accordance with Article 15(4), the specific reasons for that derogation based on the criteria laid down in that paragraph and the conditions imposed.
3. The competent authority shall also make available to the public, including via the Internet at least in relation to point (a):
 - (a) relevant information on the measures taken by the operator upon definitive cessation of activities in accordance with Article 22;
 - (b) the results of emission monitoring as required under the permit conditions and held by the competent authority.
4. Paragraphs 1, 2 and 3 of this Article shall apply subject to the restrictions laid down in Article 4(1) and (2) of Directive 2003/4/EC.

4. Actual status of the BAT document Waste Incineration

This part will concentrate on the actual BAT document *Waste Incineration*, with a short view on the complex connecting to the co-incineration of waste.

Best Available Techniques Reference Documents (BREFs) are prepared for environmentally relevant industrial installations on the basis of the European IPPC Directive 96/61/EC. The underlying aim is for industrial activities to be carried out in a manner as environmentally sound as possible and ensuring a high level of protection of the environment as a whole by preventing or reducing emissions to air, water and soil.

The preparation of the Waste Incineration BREF represents a further step towards integrated environmental protection in waste incineration. It defines very high environmental standards associated with the use of best available techniques (BAT) for reducing pollutant emissions and takes waste management aspects and energy efficiency into account.

The BAT identifies high standards in waste incineration as already applied for many years in some EU Member States the uniform standard for Europe. Table 1 below is an excerpt from chapter 5 showing how operational emission levels associated with the use of BAT were allocated to corresponding BAT flue gas treatment techniques.

Table 1: Excerpt from BAT document – Table 5.2 *Operational emission level ranges associated under BAT for releases to air* –

Substance	Unit	Non continuous measurement values	1/2 hour average	24 hour mean average	Comments
Dust	mg/Nm ³		1 – 20*	1 – 5	with use of fabric filters
HCl	mg/Nm ³		1 – 50	1 – 8	use of wet FGT systems preferred
SO ₂	mg/Nm ³		1 – 150*	1 – 40*	use of wet FGT systems preferred
NO _x with SCR	mg/Nm ³		40 – 300*	40 – 100*	requires additional energy demand and costs
NO _x with SNCR	mg/Nm ³		30 – 350	120 – 180	NH ₃ slip must be considered when raw gas concentrations are high; use in combination with wet FGT preferred
TOC	mg/Nm ³		1 – 20	1 – 10	optimized combustion conditions
CO	mg/Nm ³		5 – 100	5 – 30	optimized combustion conditions
Hg	mg/Nm ³	< 0,05*	0,001 – 0,03	0,001 – 0,02	input reduction, carbon-based adsorption
PCDD/ PCDF	ng/Nm ³	0,01 – 0,1*			optimal combustion conditions, temperature controlled reduction of de-novo synthesis, carbon-based adsorption techniques

* BAT standards not accepted by individual Member States (* Some Member States expressed split views regarding these level ranges) are marked with so-called split views

There is still a potential for technical development looking on better energy efficiency and a better quality of ashes/slag.

As the Commission decided to regulate the co-incineration of waste in the relevant sectors following sectors and the linked BREF document should be taken into :

- iron and steel industry,
- large combustion plants and
- cement, lime and magnesium industries.

Some of the problems of co-incineration can be seen during the activities on revision of BAT document *large combustion plants* which will start in the next year. And another question will deal with so called non-regular fuels like

- residues of distillation and refining in refineries;
- black liger
- blast furnace gas from steel industry

and the reasons why they can be burned under lower emission standard than waste fuels.

Here are different regulations on European and national level which are not always depend on technical reasons.

5. Summary

The IED will force Member States to take the BREF documents more into account when setting emission control requirements in permits for industrial installations, even for waste incineration plant and the co-incineration in different industrial sectors and the national regulations for the specific fuels. The Article 15 and the use of operational emission level ranges associated under BAT to set emissions values for these parameters will influence the BAT process in the future. Looking very precisely on Article 15 it may cause some differences in the use of BAT document by the competent authorities depending on the different interpretation in the EU Member States.

6. Literature

- [1] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast), Official Journal of the European Communities, L 334/17, 17.12.2010
- [2] Integrated Pollution Prevention and Control, Reference Document on the Best Available Techniques for Waste incineration, August 2006 (final version published in the Official Journal of the European Union)
- [3] Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste, Official Journal of the European Communities, L 332/91, 28.12.2000

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