

## Government Initiatives

## Integrated pollution prevention and control in large industrial installations on the basis of best available techniques – The Sevilla Process

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## ABSTRACT

With respect to emissions from industry, the IPPC Directive is one of the key instruments of the environmental legislation of the European Union. The purpose of this Directive is to achieve integrated pollution prevention and control from large industrial installations. The conditions of required permits have to be based on Best Available Techniques (BAT). In 1997, the so-called Sevilla Process was established to develop these BAT. Since then, 33 Best Available Techniques REFERENCE Documents (BREFs) were drafted, adopted and published. This Sevilla Process with its actors is described. The BREFs are unique documents containing ambitious consumption and emission levels which cannot be found anywhere else.

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## 1. Introduction

With respect to emissions from industries, the IPPC Directive [1] is one of the key instruments of the environmental legislation of the European Union. The purpose of the IPPC Directive<sup>1</sup> is to achieve integrated pollution prevention and control of pollution arising from large industrial installations. It lays down a framework requiring Member States of the European Union to issue operating permits for certain installations carrying out industrial activities as described in its Annex 1. These permits must contain emission limit values and other conditions based on best available techniques (BAT) as defined in Article 2(12) of the Directive, to achieve a high level of protection of the environment as a whole. These BAT need to be specified for the different industrial sectors as well as for horizontal issues such as industrial cooling systems, monitoring and energy efficiency. For this purpose, the Directive requires the European Commission to organise an exchange of information between Member States and the industries concerned on best available techniques, associated monitoring and developments in

them. Hereupon, the information exchange was set up as illustrated in Fig. 1.

The European Integrated Pollution Prevention and Control Bureau (European IPPC Bureau, EIPPCB) plays a central role in this information exchange process. It is part of the IPTS<sup>2</sup> which is placed in Seville. Therefore, the information exchange on BAT has become well known as the 'Sevilla Process'.<sup>3</sup> The results of this information exchange are the so-called Best Available Techniques REFERENCE Documents (BREFs) which are comprehensive and detailed documents.

The objectives of the whole information exchange exercise are:

- based on a comprehensive exchange of information, to guide the competent authorities with respect to the determination of BAT-based permit conditions at site level for individual permits as well as for the development of general binding rules.
- to help to redress any technological imbalances in the European Community through the publication of the BREFs

<sup>2</sup> The Institute for Prospective Technological Studies (IPTS) is one of the seven scientific institutes of the European Commission's Joint Research Centre (JRC). It consists of six units. One of them is the Sustainable Production and Consumption Unit, of which the European IPPC Bureau is a part.

<sup>3</sup> The first European Conference on the information exchange on BAT took place in Stuttgart, Germany from 6 to 7 April 2000 and was called 'The Sevilla Process: a driver for environmental performance in industry'; see proceedings under <http://www.umweltdaten.de/publikationen/fpdf-k/k1823.pdf>. Since this conference, the exchange of information on BAT is also called 'The Sevilla Process'.

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<sup>1</sup> The Directive of the European Parliament and of the Council concerning integrated pollution prevention and control (IPPC Directive) has recently been codified (Directive 2008/1/EC). The codified act includes all the previous amendments to Directive 96/61/EC and introduces some linguistic changes and adaptations (e.g. updating the number of legislation referred to in the text). The substance of Directive 96/61/EC has not been changed.

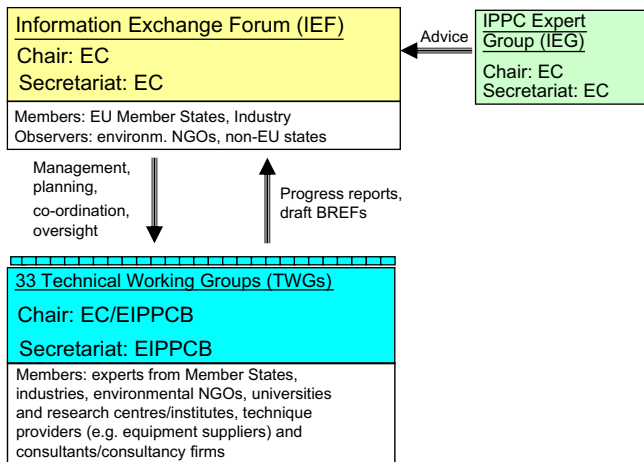


Fig. 1. Organisation of the information exchange according to Article 17(2) of the IPPC Directive, (EC: European Commission; EU: European Union).

- to promote the worldwide dissemination of achievable consumption and emission levels and performances associated with the application of BAT in the Community

Against the background of these objectives, the BREFs play an important role. Indeed, the BREFs are unique documents containing ambitious consumption and emission levels which cannot be found anywhere else.

This information exchange process is described in more detail in the following sections along with the outcome after 12 years of its practical performance.

## 2. The different actors in the Sevilla Process

### 2.1. The Information Exchange Forum (IEF)

- The IEF (see Fig. 1) steers the information exchange process. It is the forum for the discussion of general and horizontal issues relating to the information exchange. The IEF members are representatives from all Member States and from EFTA countries as well as representatives from the industry sectors covered by the Directive and from environmental non-governmental organisations (NGOs). Typically, more than 60 people are members of this forum. The IEF usually meets once or twice a year.

As the IEF is not mentioned in the IPPC Directive, this forum does not have a formal decision-making status. Thus, decisions required for making progress within the information exchange lie with the Commission, being the responsible entity for the organisation according to Article 17(2).

### 2.2. The IPPC expert group (IEG)

The IEG (see Fig. 1) is an experts group of Member State representatives (and some non-Member States such as Norway and possible future members of the EU). It usually meets once or twice a year and exchanges information on the IPPC Directive as a whole and mainly deals with the implementation and the review of the IPPC Directive.

### 2.3. The European IPPC Bureau

At the first IEF meeting in December 1996, the European Commission announced that the European IPPC Bureau (see Fig. 1)

was to be established within the IPTS<sup>2</sup>. The Bureau started its activities in May 1997. Most of the experts are recruited from authorities in various Member States which are in charge of granting environmental permits or of their enforcement as well as of inspecting industrial installations. Currently, the Bureau has in total 18 posts for BREF authors, secretariat, English language editor and formatting experts.

The European IPPC Bureau practically organises the exchange of information and produces the BREFs. The Bureau carries on its work through Technical Working Groups (TWGs). The experts of these TWGs provide information and data and then review the draft documents that are elaborated by the Bureau.

As a result of the information exchange, the BREFs are publicly available on the website of the European IPPC Bureau (<http://eippcb.jrc.ec.europa.eu>).

Fig. 2 reflects the concept of the elaboration (and review) of a BREF. Generally, there is one BREF author who works on the project for two to three years supported by the secretariat, the English language editor and the formatting experts. In order to have a fruitful information exchange and to ensure the quality of the final document, the BREF author needs to play a very active role.

### 2.4. Technical Working Groups (TWG)

A Technical Working Group (TWG) (see Fig. 1) is a group of experts established by the European Commission, after consultation with the IEF, to carry out the detailed work for the exchange of information for the different industrial activities covered by the IPPC Directive.

A TWG is set up for the development (and review) of each BREF document. The TWG is mainly active during the elaboration of the BREF. However, well after a BREF is finished, the network of experts continues to exist until the document is reviewed.

The number of TWG members varies between 30 and 110 with an average of 64.

## 3. Structure and approach for the elaboration of the BREFs

The BREFs are large documents (usually several hundred pages) and are produced following the BREF Outline and Guide,<sup>4</sup> which has been agreed with DG Environment and the IEF. The outline refers to some standard text already translated into most European languages. In particular, the preface and the standard introduction to chapters on BAT are important foundations for the understanding of BREFs.

All BREFs follow the general principles of the BREF Outline and Guide but they may be structured differently if this is more appropriate for their subject.

### 3.1. The BAT approach

The currently observed emission and consumption levels for the overall processes and the sub-processes of a sector concerned may reflect best performing, well performing and not such well performing installations. As an example, Fig. 3 shows the distribution of achieved emission levels for a certain pollutant for an industrial sector. It demonstrates the range of best, well and not such well performing installations. There are certain technical and organisational measures and techniques for achieving good and best values. In principle, the BAT approach is to go for the best performing installations rather than to create a cut-off criterion for the

<sup>4</sup> The BREF Outline and Guide is publicly available at the website of the European IPPC Bureau (<http://eippcb.jrc.ec.europa.eu>).

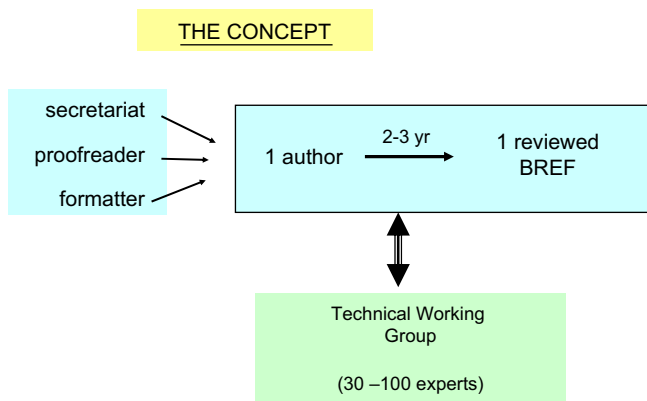


Fig. 2. The concept for the elaboration and review of a BREF.

worst performing plants. Thus, the BAT associated emission levels (BAT-AELs) do represent the best performing installations (see Fig. 3). However, BAT do not necessarily mean the 'best of the best' performing installations as there are cases where the lowest emission levels are 'beyond BAT'. This can be due to technical constraints or considerations of the economic viability with respect to the whole industrial sector concerned. In addition, techniques "beyond BAT" may be applied to meet local or regional air and/or water quality standards. Two examples may explain this:

- in cases where an installation is discharging waste water to a small river which is running dry or almost dry in summer for some months (to achieve the river water quality targets), it may be required to apply measures and techniques going beyond BAT (for instance two stage biological treatment with a low food-to-microorganisms ratio followed by activated carbon treatment and sand filtration)
- in cases where an installation is located next to a residential area and to a hospital and is emitting solvents and odorous substances at already low concentrations, it may be required that a thermal oxidation or adsorption to an appropriate medium is required going beyond BAT.

Further, the BAT in the BREFs reflect the situation of the whole sector including economics and cannot take each and every individual case into account. Competent authorities can take into account specific local considerations (technical characteristics of the

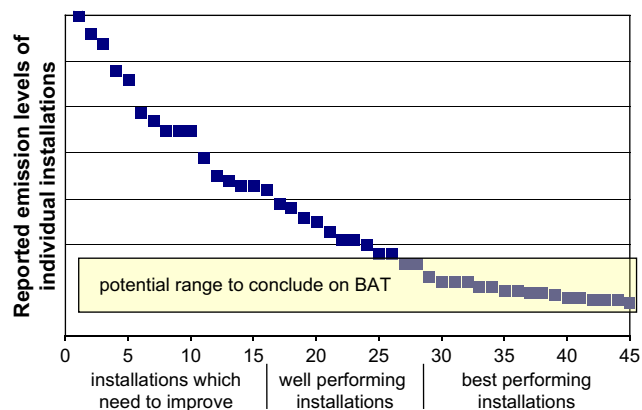


Fig. 3. Emission levels for a certain pollutant for 45 installations of an industrial sector and indication of the potential BAT range.

installation concerned, its geographical location and the local environmental conditions set in Art. 9(4) of the IPPC Directive) to set, in specific and well justified cases, permit conditions which deviate from BAT. The economic viability of a certain BAT or a combination of BAT reflects the industrial sector concerned as a whole but not individual installations with their specific circumstances.

For the decision on BAT, the expert judgement of the European IPPC Bureau and the TWG play a key role.

#### 4. Available BREFs

Annex I to the IPPC Directive refers to the categories of industrial activities covered by the Directive. For the Sevilla Process, the 57 industrial and agricultural sectors listed were grouped into 27 sets of similar or linked (sub) processes and (sub) sectors each of which is covered by one BREF (the so-called vertical BREFs). In addition, it was considered necessary to cover a number of horizontal issues, namely emissions from storage, industrial cooling systems, monitoring, economic and cross-media effects and energy efficiency in separate documents – the so-called horizontal BREFs. In addition, following an initiative of the European Commission, a TWG for a non-IPPC sector was established to elaborate the BREF on the Management of Tailings and Waste-Rock in Mining Activities. So, in total, 33 BREFs are available. The whole process to produce and adopt these documents took 11 years as indicated in Fig. 4.

#### 5. Use of the BREFs

Apart from their main purpose, which is to be used in the Member States for drafting individual permits or for the development of general binding rules, the usefulness of the BREFs has also been recognised beyond the borders of the EU.

As a member of the World Bank, the International Finance Corporation is using the BREFs for developing more than 60 industry-specific and general guidelines for sectors not covered by the mentioned specific guidelines [2].

Further, the EPE Banks have developed a 'Handbook on EU Environmental Standards'.

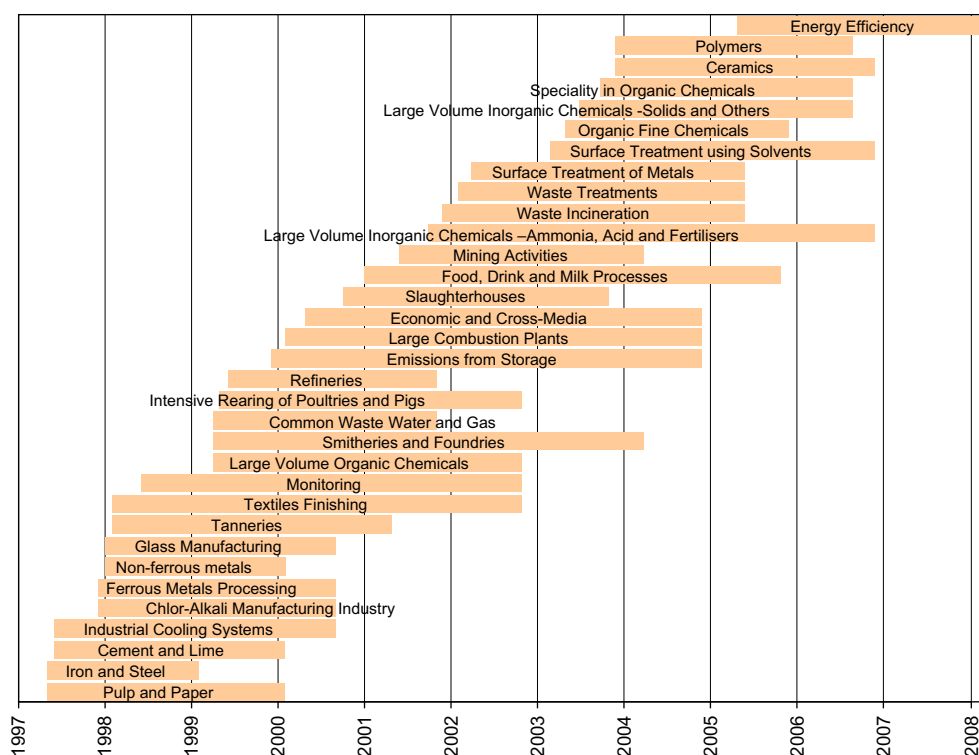
In 2005, the OECD published the 'Integrated Environmental Permitting Guidelines for EECCA Countries' and in 2007 the 'Guiding Principles of Effective Environmental Permitting Systems' where the IPPC approach is supported and the BREFs are explained and recommended.

The United Nations Industrial Development Organisation (UNIDO) also considers the BREFs when preparing documents on cleaner production as well as on best available techniques (BAT) and best environmental practice (BEP) for the prevention and abatement of persistent organic pollutants (POPs) covered by the Stockholm Convention on POPs. The same is for the protocols developed under the Convention on Long-range Transboundary Air Pollution.

Further, the European IPPC Bureau website appears as a link on more than 140 environmental websites, including websites from Russia, Egypt, Switzerland, Norway and Kazakhstan and also United Nations Environment Programme (UNEP).

Another indicator for the extensive use and consideration of the BREFs is the number of downloads from the website of the European IPPC Bureau. In 2007, there were about 72 000 BREF downloads from all over the world, in 2008 about 117 000.

So far, the BREFs are available in English only, with the executive summaries translated into all Community languages. However, many Member States have translated them into their languages, at least partially. Also non-EU countries have translated selected BREFs. For instance, the BREF for the pulp and paper industry was



**Fig. 4.** Schedule of the elaboration of the first BREF series from 1997 to 2008. In this figure, the start time corresponds to the kick-off meeting and end time corresponds to the time when the BREF was accepted at the IEF meeting. Periods with no activity (e.g. change of the BREF author) are not indicated.

translated into Chinese and Russian. Also developed non-European countries, such as the US, Canada and Japan are considering and appreciating the BREFs more and more.

## 6. Review of the existing BREFs and the proposal for a Directive on Industrial Emissions

Due to the continuously ongoing scientific and technical progress and due to changing economic conditions, best available techniques have a dynamic character. This requires the update and review of the BREFs within a number of years (as a thumb rule: 5–8 years) after their adoption.

The BREF reviews are carried out by following the Generic Schedule<sup>5</sup> as agreed upon by the Commission and the IEF. The basic concept for the review is the same as for the existing BREFs (see Fig. 2). The TWG remains the primary channel through which all information required for BREFs is gathered and assessed. Since 2005, ten BREF reviews have been started and for the cement, lime and magnesium oxide sector, the first review has been finalised in April 2009. The review of the existing BREFs show that, within

a certain sector, there can be areas with substantial changes and improvements whereas there are also areas without significant developments. E.g., ten years ago, there very few sinter and cement plants equipped with efficient bag filters whereas today these end-of-pipe-techniques are proven and common techniques achieving significant lower emissions of inorganic and organic pollutants.

On 21 December 2007 after a 2-year review process, the European Commission adopted a proposal for a Directive on Industrial Emissions to revise the existing IPPC Directive.<sup>6</sup> The proposal foresees a significant strengthening of the role of the BREFs and is currently subject to the ongoing discussion process.

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<sup>5</sup> The Generic Schedule for the review of BREFs is publicly available at the website of the European IPPC Bureau (<http://eippcb.jrc.ec.europa.eu>).

<sup>6</sup> <http://ec.europa.eu/environment/ipcc/proposal.htm>.