


The implementation of the IPPC Directive in the mercury cell chlor-alkali production industry

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Executive Summary

The objective of Directive 96/61/EC concerning integrated pollution prevention and control (IPPC) is to achieve a high level of protection of the environment as a whole, by means of the integrated prevention and reduction of pollution arising from a wide range of industrial and agricultural activities.

Integrated pollution prevention and control takes place within the framework of a system of granting permits for the operation of installations. The aim of the permit system is to guarantee that the operators of installations adopt preventive measures against pollution, particularly through the implementation of Best Available Techniques (BATs).

The Directive applied to new installations from 30 October 1999. Existing installations must meet the requirements of the Directive by 30 October 2007 at the very latest. Existing installations whose operators intend to make substantial modifications were also required to comply with the Directive from 30 October 1999.

Among the industrial installations to which this Directive applies are those of the chlor-alkali industry, whose production is currently based on three different techniques: mercury cells, diaphragm cells (with or without asbestos) and electrolyte membrane cells. According to scientific studies and the practical implementation of these techniques, it is evident that the mercury cell process used in this industry cannot be regarded as a Best Available Technique according to the definition and criteria established by the IPPC Directive.

In accordance with this Directive, the competent authorities will have to ensure the implementation of BATs when granting an integrated permit. To do so, when it comes to establishing the conditions for the integrated permit, they will need to ensure that these conditions are based on the implementation of BATs. The legal analysis undertaken leads to the conclusion that by 30 October 2007 at the very latest, all existing installations in the chlor-alkali industry will have to obtain an integrated permit in compliance with the conditions imposed by the IPPC Directive. Therefore from that date onwards the installations in this sector whose production process is based on mercury cells will have to modify their processes to ensure that BATs are implemented.

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Acronyms

BREF	BAT Reference Documents
EC	European Community
OJ	Official Journal of the European Communities
IPPC	Integrated Pollution Prevention and Control
BAT	Best Available Technique
EP	European Parliament
GBR	General Binding Rules
TEC	Treaty establishing the European Community
ECJ	European Court of Justice
EU	European Union
ELV	Emission Limit Values

Background: introduction to the issue

Directive 96/61/EC concerning integrated pollution prevention and control[1] (henceforward the IPPC Directive) entered into force on 30 October 1996. The purpose of this Directive is to achieve integrated prevention and control of pollution arising from a wide range of industrial and agricultural activities and a high level of protection of the environment as a whole[2].

In accordance with its articles, the Directive applied as from 30 October 1999 to new installations and existing installations[3] whose operators intended to carry out a substantial change[4]. Existing installations have to meet the requirements of the Directive no later than 30 October 2007.

Integrated pollution prevention and control takes place within the framework of a system that grants permits for the operation of installations. "Integrated" means that the permit conditions must take into account all the environmental impacts of the plant, i.e. air, water and land, the generation of waste, the use of raw materials, energy efficiency, noise, prevention of accidents, risk management, etc. Thus installations to which the Directive applies must achieve a high level of environmental protection as a whole.

The goal of the permit system is to guarantee that the operators of installations adopt pollution prevention measures, particularly by implementing Best Available Techniques (BATs). In order to exchange information on BATs, the European Commission has organised a system for exchanging information between experts from industry, the regulatory authorities and environmental organisations in Member States. This work is coordinated by the European IPPC Bureau and has been divided into thirty sectors, in accordance with Annex I of the Directive, which contains the categories of industrial activities to which the IPPC Directive applies. For each sector, a document known as the BREF (BAT Reference Documents) has been developed.

Among the industrial activities to which the Directive applies is the chlor-alkali industry. This industry produces chlorine and alkaline products through brine electrolysis. The main technologies in chlor-alkaline production are:

- Mercury cells
- Diaphragm cells (with or without asbestos), and
- Electrolytic membrane cells.

These technologies were examined as part of the exchange of information on BATs by the European IPPC Bureau. The BAT Reference Document on chlor-alkali production[5] concludes that the BAT for chlor-alkaline production is the electrolytic membrane cell process, as well as the non-asbestos diaphragm cell process[6]. Likewise, it points out that mercury cell plants are not BAT[7] and that the BAT for mercury cell plants is to convert them to membrane cell technology[8].

The chlor-alkali industry is not only the largest user of mercury in the EU but also the most significant one[9]. Mercury and its compounds are extremely toxic to human health, ecosystems and wildlife. In high doses they can be fatal to humans, but even in small doses they can have adverse and serious effects on neuronal development. Mercury has recently been associated with possible damaging effects on the cardiovascular, immunological and reproductive systems.

Mercury pollution is a chronic and widespread global problem. When mercury comes into contact with the environment it transfers from species to species by means of a process known as bioaccumulation. In the environment, mercury can transform itself and become methylmercury, its most toxic form. Methylmercury easily crosses both the placental and hematoencephalic barriers, which can retard and even paralyse mental development before birth. Methylmercury accumulates and becomes particularly concentrated in the food chain originating in the sea, primarily impacting on people who eat a significant amount of fish and shellfish.

One of the main sources of mercury is chlor-alkali production plants based on mercury cell technologies. In Western Europe, chlor-alkali production using these cells is the predominant industry (54% of the production of chlorine used this method in 2001).[10]

[1] OJ no. L 257 of 10/10/1996
[2] Article 1, IPPC Directive
[3] "Existing installation" is an installation in operation or, in accordance with legislation existing before the date on which this Directive was brought into effect, an installation authorised or in the view of the competent authority the subject of a full request for authorisation, provided that that installation is put into operation no later than one year after the date on which this Directive is brought into effect (article 2.4).
[4] Articles 12.2 and 21, IPPC Directive
[5] Reference document on Best Available Techniques in the Chlor-Alkali Manufacturing Industry, October 2000, adopted by the Commission in December 2001. Available at http://eippcb.jrc.es
[6] Reference Document note 5 ut supra p. iii and 109
[7] Reference Document note 5 ut supra p. 120
[8] Reference Document note 5 ut supra p. v and 111
[9] Extended Impact Assessment to the Communication from the Commission to the Council and the European Parliament on Community Strategy Concerning Mercury. SEC(2005)101. Brussels, 28.1.2005. p.6.
[10] *Report from the Commission to the Council concerning mercury from the chlor-alkali industry, COM (2002) 489 end.*

In view of this serious problem, the international community has started making efforts to combat the effects of mercury. Thus within the framework of the United Nations Environmental Programme, a Global Mercury Assessment was carried out[11] and subsequently, the Mercury Programme[12] was established. The EU has set itself the task of tackling this problem. To do so, the European Commission presented the European Council and Parliament with a Community Strategy on Mercury.[13]

As indicated, according to the IPPC Directive, the transitional period for existing installations to obtain an integrated permit or authorisation comes to an end on 30 October 2007. Among the requirements for obtaining this permit is that the installations apply the BAT so that the competent authorities can establish the conditions for the permit based on these BAT. Therefore, in accordance with the IPPC Directive, existing installations that produce chlor-alkaline with mercury cells will have to have a permit based on BAT by the indicated date.

Eurochlor, the association that encompasses the chlor-alkali producers in the EU, has been claiming that the total decommissioning of mercury cells will not be achieved until 2020[14]. Meanwhile, most of the EU Member States have shown their commitment to completely phasing out mercury cell technology by 2010[15].

The dates being announced by the chlor-alkali industry and the Member States to implement BATs to existing mercury cell chlor-alkali installations do not correspond with the deadline for compliance with the obligations established in the IPPC Directive. In view of the risks that the use of mercury raises, particularly mercury cells, there is an urgent need to clearly establish the obligations set forth in the IPPC Directive for plants in the chlor-alkali production industry that use mercury cells in their production processes.

This legal report has been prepared at the request of the international organisation Oceana, the objective of which is:

- To determine the exact deadline for eliminating mercury cell technology in the territory of the European Union.

To do so, an exhaustive analysis has been carried out, which included:

- establishing the obligations and requirements of the IPPC Directive for the operations of all the installations included in the scope of its application, with a special emphasis on the requirements for obtaining the integra ted permit and implementing BATs.

- to determine the obligations and requirements established by the IPPC Directive for installations in the chlor-alkali sector that use mercury cells in their production processes.

[11] *Mercury Assessment, UNEP-Chemicals, p. 130, paragraph 578, Geneva, Switzerland, December 2002.*
[12] Decisions of the Governing Council 22/4 V of 7 February 2003 which established the mercury programme and 23/9 IV, containing the agreement to establish partnerships for developing the mercury programme.
[13] COM (2005) 20 final de 28.01.2005.
[14] Euro Chlor's contribution to the European Commission's consultation document on the development of an EU Mercury Strategy, May 2004 en europa.eu.int/comm/environment/chemicals/mercury/pdf/ eurochlor.pdf y en Chlorine Industry Review 2000-2001 www.eurochlor.org/chlorine/Chlorine_Industry_Review/Environmental_performance.htm
[15] Overview Assessment of Implementation of PARCOM Decision 90/3 on Reducing Atmospheric Emissions from Existing Chlor-Alkali Plants. Fuente: HSC 04/3/8-Rev.1. http://www.ospar.org/documents/dbase/decrecs/implementation/pd90-3.doc

1. Preliminary considerations

The legal instrument chosen to harmonise the procedure and conditions for the permit in the EU was a Directive. Together with the Constitutional Treaty which represents the primary source of Community Law, the community Directive, a secondary source, has been the most frequently-used instrument to protect the environment in the European Community.

Directives are binding upon each Member State to which they are addressed,, although it is left up to the national authorities to choose the form and the methods[16].

The prompt and proper transposition of directives is of crucial importance, as the so-called “effect utile” depends upon this – i.e., compliance with the objective, within the framework of the Constitutional Treaties, is sought by community institutions when adopting a legal instrument and, in short, the uniform implementation of community law in the whole of the European Union. Following prompt and proper transposition, the Member States are obliged to apply the Directive and comply with the obligations that it imposes.

As indicated by the European Court of Justice (ECJ)[17], the community legal practice, shows that there can be big differences in terms of the types of obligations that directives impose upon Member States and, therefore, in terms of the results that need to be achieved:

- Some directives require legislative measures to be adopted at national level and compliance with those measures to be the subject of judicial or administrative review[18].
- Other directives lay down that the Member States are to take the necessary measures to ensure that certain objectives formulated in general and unquantifiable terms are attained, whilst leaving them some discretion as to the nature of the measures to be taken[19].
- Yet other directives require the Member States to obtain very precise and specific results after a certain period[20].

The legal basis of the IPPC Directive is the old article 130 R of the TEC, today article 174, which sets out the objectives and principles of European Community environmental policy. It is important to bear in mind that the measures adopted for compliance with the objectives of this policy, such as the IPPC Directive, establish minimum protection levels that must be respected by all the Member States, without these being an obstacle to the adoption and maintenance, by each individual Member State, of stricter protection measures. Article 176 of the TEC authorises Member States to maintain or adopt stricter protection measures, on the condition that they are compatible with the Treaty and are notified to the Commission. Thus within the framework of the Community environmental policy, and so long as the national measure pursues the same objectives as the Directive, article 176 EC envisages and authorises, under certain conditions, the minimum requirements established by this Directive to be superseded[21]. Therefore the minimum requirements must always be respected by the Member States.

[16] Article 249, EC Treaty.
[17] Case C-60/01, European Commission v French Republic,[2002] para. 25.
[18] Case C-360/88 European Commission v Belgium [1988] Rec..p. 3803 and Case C-329/89 Commission v Greece [1989] ECR .p. 4159
[19] The ECJ offers as an example article 4 of Directive 75/442/EEC on waste. Case C-365/97 Commission v Italy [1999] ECR. p. I-7773
[20] The ECJ offers as an example article 4.1 of Directive 76/160/EEC concerning the quality of bathing water. Case C-56-90 Commission v United Kingdom [1993] ECR. p. I-4109 paragraphs. 42 to 44; Case C-198/97 Commission v Germany [1999], ECR p. I-3257 paragraph 35; Case C-307/98 Commission v Belgium [2000] ECR p. I-3933 paragraph 51, and Case C-268/00 Commission v Netherlands [2002] ECR. p. I-0000 paragraphs 12 to 14.
[21] Case C 6/2003 Deponiezweckverband Eiterköpfe v Land Rheinland-Pfalz, [2005] paragraph 58.

2. The IPPC Directive

One of the weaknesses that used to characterise community environmental legislation was its emphasis on “end-of-pipe” techniques for reducing pollution. However, the IPPC Directive is aimed at the prevention, reduction and, as far as possible, elimination of pollution, acting preferably on the source of the pollution, in accordance with the principles of community environmental policy[22]. In contrast to the majority of “end-of-pipe” measures, the prevention of pollution encouraged by the IPPC Directive is not only beneficial to the environment but also its development and implementation are supported by the fact that it represents a significant cost-benefit ratio, given that the generation of pollution and waste reveals an inefficient production process.

As already mentioned, the objective of the IPPC Directive is to achieve a high level of protection of the environment as a whole by means of the integrated prevention and reduction of pollution.

This Directive requires the regulation of a wide variety of industrial activities, grouped into six categories:

- Energy industries,
- Production and transformation of metals,
- Mineral industries,
- Chemical industry,
- Waste management, and
- Other activities, such as the paper and pulp industry, leather tanning, food processing and some agricultural activities.

La Directiva se dirige principalmente a grandes instalaciones y, para la mayoría de los sectores, establece unos valores umbrales referidos a capacidades de producción o a rendimientos.

La prevención y el control integrados de la contaminación se producen en el marco de un sistema de concesión de permisos para la explotación de instalaciones. El sistema de permisos tiene como meta garantizar que los titulares de las instalaciones adopten medidas de prevención de la contaminación, en especial mediante la aplicación de las mejores técnicas disponibles. Conforme a la Directiva, esas medidas debían aplicarse a partir del 30 de octubre de 1999 en las instalaciones nuevas y, a partir del 30 de octubre de 2007 en las instalaciones existentes. No obstante, la propia Directiva indica una serie de medidas que también eran aplicables a las instalaciones existentes desde el 30 de octubre de 1999[23] .

Essential elements of the IPPC Directive

- Requirement to obtain an integrated permit for all installations

- Requirement to implement the Best Available Techniques

[22] Article 174.2 EC Treaty. We should remember that another of the principles established is the “polluter-pays” principle.

[23] These are: compliance with the objectives of the Directive (art. 1); application of the definitions of article 2; the requirement to take into account the evolution of BATs (art. 11); the obligation to notify any changes and to submit substantial modifications to the requirement of obtaining an integrated permit (art. 12); the obligation for operators of installations to allow inspections to take place without hindrance (art. 14, section 3); the participation of the general public in the process of reviewing authorisation when this has to take place due to the generation of pollution (art. 15, 1.3 and 4); the exchange of information on BATs (art. 16); the exchange of information between States in the event of transboundary-pollution (art. 17) and respect for the emission limits already established by a series of Directives (art. 18).

2.1. The Integrated Permit

This permit is.that part or the whole of a written decision (or several such decisions) granting authorization to operate all or part of an installation, subject to certain conditions which guarantee that the installation complies with the requirements of this Directive. This definition, provided by the IPPC Directive itself in article 2.9, leaves no room for doubt: the permit granted must guarantee that the installation operates in line with the minimum requirements of the Directive.

All the installations belonging to the industrial categories to which this Directive applies are obliged to have a permit in order to operate. Substantial modifications also need to have a permit of this kind. The definitive deadline for all installations to have a permit in compliance with the requirements of the IPPC Directive is October 2007.

2.1.1. The Application

The operator of the installation is obliged to apply for a permit from the competent authority. Most of the States have decided to delegate the obligations imposed by the Directive to their local or regional authorities. In accordance with the Directive[24], the minimum information that the application should contain is a description of:

- the installation and its activities,
- the raw and auxiliary materials, other substances and the energy used in or generated by the installation,
- the sources of emissions from the installation,
- the conditions of the site of the installation,
- the nature and quantities of foreseeable emissions from the installation into each medium as well as identification of significant effects of the emissions on the environment,
- the proposed technology and other techniques for preventing or, where this not possible, reducing emissions from the installation,
- where necessary, measures for the prevention and recovery of waste generated by the installation,
- Further measures planned to comply with the general principles of the Basic obligations of the operator as provided for in Article 3. These general principles of the fundamental obligations of the owner must include the provision of a description of all the appropriate measures for preventing pollution, particulary by the im plementation of BATs[27]
- Measures planned to monitor emissions into the environment.
- A summary that is understandable to be layman with regard to all the indications specified in the previous sections.
- A brief summary of the main alternatives studied by the applicant, if any.

[24] Article 6

2.1.2. The general principles of the operator's obligations

In the process of reviewing the application, the competent authorities are obliged to corroborate, at least when establishing the conditions of the permit, that the operator will comply with the general principles of his fundamental obligations, which are clearly established in the Directive[25].

a) all the appropriate preventive measures are taken against pollution, in particular through application of the best available techniques;
b) no significant pollution is caused;
c) Avoid waste production and, when that were impossible: reduce, recycle, reuse or store them in a secure place.
d) energy is used efficiently;
e) the necessary measures are taken to prevent accidents and limit their consequences;
f) the necessary measures are taken upon definitive cessation of activities to avoid any pollution risk and return the site of operation to a satisfactory state.

2.1.3. The conditions of the permit

Once the competent authority has corroborated all the details provided by the operator of the installation, it will grant a written permit that will be accompanied by the conditions that guarantee the requirements envisaged in the Directive; alternatively, it will refuse the permit. The minimum conditions that the permit should contain are:

- The emission limit values (ELV) for the pollutants which may be emitted in significant amounts by the installation, especially those listed by the IPPC Directive, taking into account their nature and the potential for transporting pollution from one environment to another. If necessary, it should also contain the opportune requirements to guarantee the protection of the land and subterranean water, as well as measures relating to the management of waste generated by the installation. In specific cases, the emission limit values may be complemented or replaced by equivalent parameters or technical measurements.

These ELVs and equivalent parameters and technical measurements will be based on the BATs, without stipulating the use of a specific technique or technology, and taking into consideration the technical characteristics of the installation in question, its geographical location and local environmental conditions. Temporary exceptions to the requirement for establishing ELVs, parameters and technical measurements based on BATs can be included if there is a rehabilitation plan that guarantees that these requirements will be observed within a period of six months, and in the case of a project that entails a reduction in pollution.

In addition, if there is an environmental quality regulation that requires more stringent conditions than those that can be achieved by implementing BATs, the permit will demand the implementation of complementary conditions, without prejudice to other measures that may be taken to respect environmental quality regulations.

- Regulations relating to minimising long-distance or cross-border pollution;

- Conditions that guarantee a high level of protection to the environment as a whole;

- The appropriate measures in terms of waste control, specifying the method of measurement, its frequency and the procedure for evaluating these measures;

- The obligation to notify the competent authority of the details necessary in order to corroborate compliance with the provisions of the permit;

[25] Article 3.

- Measures relating to operating conditions that are different from normal operating conditions:
- Other specific conditions if these are deemed opportune by the Member States or competent authorities.

The Directive authorises Member States to set specific obligations for specific categories of installations in General Binding Rules (GBR) instead of the conditions of the permit, so long this guarantees an integrated approach and a similar high level of protection to the environment as a whole.

This type of GBR could consist of establishing ELVs, parameters and technical measures that are identical for all the installations that belong to a particular sector. Nonetheless, each installation will still have to apply for its individual permit.

The authorities should regularly review and update the conditions of the permit. Any essential changes to installations are also subject to obtaining a permit.

In light of the provisions of the Directive, it is clear that both the competent authorities and the Member States are obliged to demand that installations covered by the IPPC Directive should implement BATs. In demanding the implementation of BATs, and by defining them so that environmental problems can be evaluated and compared on a common basis, the IPPC takes a further step by demanding that the technology used in installations is the best for the environment as a whole[26].

While it is true that, as mentioned, "the adoption of the majority of obligatory decisions on environmental regulations is the responsibility of the authorities of Member States, in accordance with the principle of subsidiarity"[27], it is no less true that the obligation to demand the implementation of the BAT is a minimum requirement.

It should be kept in mind that when the Commission presented the draft IPPC Directive, it justified the need to act on a community-wide basis. This is a shared competence and at that time the old article 130 R, section 4, of the TEC applied, which stated: the community shall take action relating to the environment to the extent to which the objectives referred to in paragraph 1 can be attained better at Community level than at the level of the individual Member States. In other words, based on the principle of subsidiarity which, with the Maastricht reform, was added as a principle that applies to all EC policies. Now this principle is reflected in article 5 TEC, second paragraph, according to which the Community shall take action, only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States and can therefore, by reason of the scale or effects of the proposed action, be better achieved by the Community.

The objective of the IPPC Directive, which consists of achieving "a high level of protection for the environment taken as a whole" will not be achieved by means of actions undertaken solely by the Member States, hence the demand for minimum requirements, compliance with which must be guaranteed by each Member State. Thus all the essential provisions for defining an integrated approach to industrial pollution are established at community level, but the choice of the measures for putting these provisions into practice is left entirely at the discretion of the Member States (for example, the organisation that the competent authorities should adopt, the number of decisions included in a permit, setting emission limit values, etc.)[28].

[26] Propuesta de Directiva del Consejo relativa a la prevención y el control integrados de la contaminación, COM (93) 423 final, Bruselas 14 de septiembre de 1993, p. 3.
[27] Communication from the Commission to the Council, the EP, the European Economic and Social Committee and the Committee of the Regions. *On the Road to Sustainable Production - Progress in implementing Council Directive 96/61/EC concerning integrated pollution prevention and control* COM (2003) 354 final, Brussels 16.6.2003, p. 4.
[28] European Commission note 27 ut supra p. 6.

> ""...there appears to be a fatal lacunae in the mechanisms for monitoring the implementation of the Directive. A statement in the Communication is illuminating in this respect: "In accordance with the principle of subsidiarity, Member States have exclusive responsibility for the implementation of the Directive. The role of the Commission is to facilitate exchange of information at EU level"(p.6)
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> Taken literally, this could effectively leave the possibilities to monitor the implementation in limbo. Ultimately, one can question the added value of European legislation if it does not lead to sufficient consistence and coherence in the implementation. Needless to say, such legislation also becomes problematic from the point of view of our possibility to be of assistance to citizens who turn to Parliament with petitions if, in the end, all that can be replied to the petitioner is that whatever shortcomings there are in the national application, it is up to the competent national authorities to remedy these."
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> Committee on Petitions of the European Parliament (EP), Report A5-0034/2004 for the Resolution of PE-P5_TA (2004) 0082 integrated pollution prevention and control p. 17

The IPPC Directive does not impose; i.e. it does not oblige the implementation of a specific BAT for each type of industrial activity categorised in Annex 1, as it is possible that there is more than one BAT for a particular category, this being precisely the case with the chlor-alkali industry under analysis. If this were not the case, it would not then allow the technological innovation that the IPPC Directive indirectly promotes[29]. However, the Directive does not allow the concession of a permit for an installation whose conditions are based on the use of techniques that are not the best available, always bearing in mind the technical characteristics of the installation in question, its geographical location and the local environmental conditions. There are only two temporary exceptions to this sine qua no condition that an integrated permit must contain:

- When there is a rehabilitation plan approved by the competent authority that guarantees compliance with this condition within no more than six months;
- When a project involves a reduction in pollution.

The permit issued must establish the application of these temporary exceptions to the conditions it contains in order for the operation of the installation to be authorised.

When a Member State establishes in General Binding Rules the specific conditions for specific categories of installations, it must also respect the minimum requirements established in the IPPC Directive.

The Directive stipulates that the operation of existing installations will have to adapt to the requirements of the Directive by 30 October 2007. This is a clearly-expressed obligation. Consequently, it is not enough to simply grant a permit before 30 October 2007. Amongst the fundamental obligations of the operators of installations is the overriding obligation to take all appropriate measures to prevent pollution, particularly by means of implementing BATs. This obligation has been in force since 1999, and known about since 1996. In other words, enough time has been allowed for the Member States to adopt a strategy in this respect.

A central concern highlighted by the Commission[30] is the lack of strategies in place in many Member States for adapting existing installations. It is likely that Member States which have still not adopted a strategy relating to the permits for existing installations are facing serious problems in meeting the 2007 deadline. However, they are obliged to guarantee compliance with the requirements of the Directive, including the implementation of BATs.

It is worth remembering that the demand to implement BATs has no other purpose than to achieve the general objective of the Directive, which is to provide: "a high level of protection to the environment as a whole".

[29] The draft Directive's explanation of reasons coincided with this observation: "Demanding that the permit makes it obligatory to use certain techniques or technologies would represent the stifling of technical innovation and management", p. 15.
[30] European Commission note *ut supra* 28.

2.2. Best Available Techniques

The Directive offers a comprehensive definition of what should be understood by BATs.

Definition of BATs in the IPPC Directive[31]

The most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing, in principle, the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole. They can also be understood as:

'techniques` shall include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned,

'available` techniques shall mean 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` shall mean most effective in achieving a high general level of protection of the environment as a whole.

Furthermore, Annex IV of the Directive offers a series of criteria that should be taken into account either generally or specifically when it comes to determining BATs, bearing in mind the costs and benefits that may arise from an action and the principles of precaution and prevention. These are:

1. the use of low-waste technology;
2. the use of less hazardous substances;
3. the furthering of recovery and recycling of substances generated and used in the process and of waste, where appropriate;
4. comparable processes, facilities or methods of operation which have been tried with success on an industrial scale;
5. technological advances and changes in scientific knowledge and understanding;
6. the nature, effects and volume of the emissions concerned;
7. the commissioning dates for new or existing installations;
8. the length of time needed to introduce the best available technique;
9. the consumption and nature of raw materials (including water) used in the process and their energy efficiency;
10. the need to prevent accidents and to minimize the consequences for the environment;
11. the information published by the Commission pursuant to Article 16 (2) or by international organizations.

[31] Article 2.11.

Unfortunately, the Directive does not apply hierarchical or selective criteria when it comes to taking these considerations into account. In fact, a study has revealed that these considerations contain a significant number of repetitions and are very heterogeneous[32].

2.2.1. The cost factor in defining BATs

It is worth remembering that the prevention and reduction of atmospheric pollution coming from industrial installations in the EU has, since 1984, been guided by the Best Available Technology Not Entailing Excessive Costs criteria – BATNEEC. This concept was introduced by the Council's Directive 84/360/EEC relating to the fight against atmospheric pollution from industrial installations[33]. The difference between technology and technique is that the latter includes the training of personnel, maintenance of the installation, controls and other factors such as design, construction and decommissioning[34]. This Directive also demanded prior authorisation for new installations and the adaptation of existing installations to the requirements of the Directive. The "NEEC" classification is kept, as we have seen, in the definition of BATs given by the IPPC Directive under the concept of "available".

BATs can vary from one installation to another, because it is obvious that costs and benefits can also vary. The fact that the costs and benefits enter into the definition of BATs also means that these techniques are inevitably the result of a balance between the different repercussions on the environment and the costs that they entail.

According to the definition of the concept, the techniques need to be developed on a scale that allows their implementation in the context of the relevant sector. Trials to corroborate the nature of BATs can come from one or various installations that implement them anywhere in the world. In exceptional cases, experimental projects can also provide a sufficient basis.

Inevitably, some of the BATs will not be amortisable, but the application of the principle "who pollutes, pays" means that their benefits for society outweigh the costs that have to be assumed by the operator[35].

In light of the provisions of the Directive, the excessive cost entailed in implementing a BAT is not the only criterion that should be taken into account when a competent authority has to decide on the conditions of a permit. Apart from the fact that the IPPC Directive is clear in this respect, we can also come to this conclusion through analogy, as we will see below.

The ECJ[36] recently ruled on Greece's failure to implement defined policies or strategies to progressively adapt to the best available technology the steam turbine units and gas turbine units of the power station operated by the Dimosia Epicheirisi Ilektrismou (DEI), which belong to the public electricity company in Crete, in accordance with article 13 of Directive 84/360/EEC. The Greek Government stated that adaptation of the power station to the best available technology would have generated excessive costs for the DEI. The European Commission responded that, on the one hand those costs were not the only criteria concerning adaptation set out in article 13 of Directive 84/360 and, on the other, that such costs must be considered bearing in mind the years which have elapsed since entry into force of the Directive.

[32] Laforest, V. and Bertheas, R. Integrated environmental regulation – how to define best available techniques? A study undertaken in the framework of the European project ENVIREDOX (IPS-20000-00035).
[33] OJEC L 188 of 16/07/1984
[34] Sorrell, S. The Meaning of BATNEEC: Interpreting excessive costs in UK industrial pollution regulation. Science and Technology Policy Research. Electronic Working Paper Series. Paper No. 61. February 2001, p.7. Available at www.sussex.ac.uk/spru/. Also see definition of "technique" in the BAT definition given by the Directive.
[35] European Commission note ut supra 28, p.15.
[36] Case C-364/03 Commission v Greece [2005], sections 22 & 53.1

Article 13 of Directive 84/360/EEC states that:

In the light of an examination of developments as regards the best available technology and the environmental situation, the Member States shall implement policies and strategies, including appropriate measures, for the gradual adaptation of existing plants belonging to the categories given in Annex I to the best available technology, taking into account in particular:

– *the plant's technical characteristics,*

– *its rate of utilization and length of its remaining life,*

– *the nature and volume of polluting emissions from it,*

– *the desirability of not entailing excessive costs for the plant concerned, having regard in particular to the economic situation of undertakings belonging to the category in question.*

The ECJ sentenced the Greek government. Amongst its appraisals, it indicated:

30. Whilst it is true, as the Hellenic Government maintains, that it is clear from Article 13 of Directive 84/360 that the Member States enjoy a certain discretion as to the measures appropriate for combating atmospheric pollution, it is none the less true that that provision compels the Member States progressively to adapt the plant covered by the directive to the technology at issue in line with its development.

31 In that regard it is important to note that the volume of emissions from a plant covered by Directive 84/360 certainly has an influence on the kind of measures to be adopted. None the less, it does not follow from that finding that, even on the supposition that the polluting emissions do not attain a significant volume, a Member State is permitted not to adapt that plant to the best available technology. Specifically in light of that finding it must be examined whether the Hellenic Republic has in the present case complied with its obligation under Article 13 of the directive.

In other words, the ECJ clearly establishes the fact that even if pollution from an installation is reduced, in this particular case referring to emissions into the atmosphere, it does not exonerate a Member State from fulfilling its obligation to adapt these installations to the best available technology.

The Commission was not condemning the Hellenic government for not having adopted measures that could have reduced the atmospheric pollution issued by the power station, but rather was accusing it of not having implemented a policy or strategy to adapt that power station to the best available technology.

Among the measures alleged by the Greek government to prove that it had implemented the best available technologies was the reduction in the maximum content of sulphur in the oil used by the power station. The ECJ commented on this issue, accepting that the reduction of the maximum sulphur content in the oil used by the power station could be taken into consideration, in principle, as a measure of adapting to the best available technology of an industrial installation such as the power station, given that it may have considerably reduced the level of atmospheric pollution produced by the installation. Nonetheless, it also pointed out that a consideration of this kind presupposed that the sulphur content of the oil used should be the lowest available in the market.

It was proven that the sulphur content of the oil used by the power station came to 2.6%, while there was a fuel available on the market with a lower sulphur content, 0.4%, and, moreover, it far exceeded the sulphur content of the oil used by the industrial installations in the Athens area, which came to 0.7%.

The Greek government alleged that the use of fuel with the lowest sulphur content available on the market was not imposed by article 13 of Directive 84/360 and that its use would have occasioned excessive costs to DEI. The ECJ did not accept this allegation, resolving that although the use of oil with a sulphur content of around 1% would have incurred a one-off investment of 3 million euros and an increase in the running costs of acquiring the oil of approximately

6 million euros per year, these amounts did not represent excessive costs in relation, on the one hand, to the economic situation of the DEI described by the parties in the dispute and, on the other, with the fact that the company in question has around 6.7 million clients.

Greece argued other measures to prove that it had implemented a policy or strategy of adapting the power station to the best available technology, but these were not accepted by the Courts either.

Therefore, in view of this judgment, it is obvious that cost is not the only criterion to bear in mind when it comes to defining and choosing the best available technology. In addition, we offer below some criteria to take into account when making a cost analysis:

- The economic situation of the company, not just the authorised installation
- The number of clients that the company has

Although this judgment does not mention BATs, but rather the best available technology, there is no doubt whatsoever that it sets an important and useful precedent when it comes to interpreting the obligations of the IPPC Directive.

2.2.2. Exchange of information: the Seville process

Article 16.2 of the Directive requires the European Commission to organise an exchange of information on BATs between Member States and the industries involved. The objectives are to facilitate the exchange of information, notably by the publication of reference documents, encourage EU countries to achieve technological homogenisation, internationally disseminate ELVs and the techniques used in the EU, and help Member States to effectively implement the Directive.

The exchange of information on BATs and control activities is occasionally given the name “the Seville process”, due to the fact that it is carried out under the coordination of the European IPPC Bureau, which belongs to the Institute for Prospective Technological Studies of the Commission’s Joint Research Centre, whose headquarters are in Seville.

The main results of this exchange of information are the technical BAT reference documents (BREF) referred to in Annex IV. The objectives of the BREF are:

- To catalogue all the industrial processes carried out and tested in Europe for all the industrial activities defined in Annex I of the Directive.
- To serve as a tool for the competent authorities to make decisions when it comes to establishing the conditions for permits, as well as for professional operators who have to define the environmental policies of the installations.

As the Commission has stated[37], the BREF documents do not impose legally binding regulations, but rather limit themselves to providing information for reference. In other words, they serve as guidelines or principles. The European Parliament “considers that the status and role of the information exchange network and the “reference documents” (BREFs), whose aim is to make comparative analyses and to identify and seek to guide the determination of “best available technology” (BAT) elements which constitute the Directive’s cornerstone, and thus the issuing of permits for installations covered by the Directive, need further clarification;”[38].

[37] European Commission, note ut supra 28, p. 18.
[38] EP Resolution EP-P5_TA(2004)0082 section 13.

While the BREF are not binding, we believe that they are illuminating when it comes to establishing exactly what the BATs are in a particular sector. The competent authorities should take them into consideration when it comes to studying applications for permits and establishing the conditions for their concession. It would seem illogical that the installations of a particular sector were to obtain permits whose conditions are based on the implementation of a technique that a BREF has identified as obsolete and not fulfilling the BAT criteria. Therefore, the fact that it is not binding should be understood in the context that it does not impose the use of a technique identified as a BAT, and that the competent authority has a certain leeway for choosing between the techniques identified as BATs.

Indeed, it would make no sense and would be a waste of resources if the efforts made within the framework of the Seville process were not considered or used by the Member States and the competent authorities when it comes to making decisions. Furthermore, it would be a paradox for a particular sector, whose conditions are based on techniques that have been identified as bad or the worst available techniques, were to obtain integrated permits.

2.2.3. Possible socioeconomic impact of implementing BATs

From the study undertaken by the Commission on the impact of BATs on the competitiveness of certain installations[39], the following factors have been verified, amongst others:

- There is no evidence that companies which implement BATs to achieve high levels of environmental compliance stop being competitive at a national or international level;
- Many installations manage to use their good environmental record as a competitive advantage;
- However, it does come to the conclusion that the early implementation of BATs in other companies in the sectors under study may have a negative, minimal or no impact at all on the competitiveness of these installations[40].

The European Commission also points out in its Communication that there may be specific cases where the operators lack the necessary means to transform their installations by implementing BATs. This problem may crop up in particular in regions where development is slower or where there is a situation of industrial decline. When the operators of installations cannot manage to comply with the environmental requirements of the Directive, the Member States need to be encouraged to actively promote industrial conversion, which is beneficial for both the environment and the economy. Certain areas of the European Union can resort to structural funds for this purpose. Indeed, the Regulation relating to the European Regional Development Fund[41] for the 2007-2013 period envisages that, in accordance with the objective of “convergence”, the FEDER will centre its interventions on supporting sustainable and integrated economic development, at regional and local level, through the mobilisation and reinforcement of endogenous capacity through programmes geared towards modernising and diversifying regional economic structures, including the environment, with investment earmarked for the integrated prevention and control of pollution[42].

[39] *The Impact of BAT on the Competitiveness of European Industry (case studies in the sectors of cement, non-ferrous metals and pulp and paper industries), David Hitchens et al, Institute for Prospective Technological Studies, November 2001. Available at: www.jrc.es/pages/f-publications.html.*
[40] European Commission, note ut supra 28, p.13.
[41] Regulation (EC) No 1080/2006 of the European Parliament and of the Council of 5 July 2006 on the European Regional Development Fund and repealing Regulation (EC) No 1783/1999.
[42] Article 4.3 of the draft.

2.2.4. Implementation of BATs by 2007

The Directive establishes that by 30 October 2007 the operation of installations must come in line with the requirements of the Directive. This is an unequivocally expressed obligation. Consequently, it is not enough to simply grant a permit before 30 October 2007. Amongst the fundamental obligations of the operators of installations is the overriding obligation to take all appropriate measures to prevent pollution, particularly by means of implementing BATs.

3. The implementation of the IPPC Directive in the chlor-alkali industry

Annex I of the Directive that covers the categories of industrial activities that fall within its scope of application includes:

Section 4.2: Chemical installations for the production of basic inorganic chemicals, such as:

a) chlorine
b) potassium hydroxide and sodium hydroxide

Consequently, the installations of the chlor-alkali industry fall within the scope of application of the IPPC Directive. This industry produces chlorine and alkaline products by brine electrolysis. The main technologies used for chlor-alkali production are:

- Mercury cells,
- Diaphragm, which may or may not be asbestos, and
- Electrolytic membrane cells

The processes based on the diaphragm and mercury cell techniques have been used since the end of the 19th century. Processes based on membrane cells were developed in 1970.

3.1. The chlor-alkali industry

At present, 95% of the world's chlorine production is obtained by the chlor-alkali process. The geographical distribution of chlor-alkali processes (the capacity to produce chlorine) varies appreciably:

Western Europe is the second world chlor-alkali producer, after the United States, with a total chlorine production of 9.4 million tonnes in 1997[43]. In the United States, the process based on diaphragm technology is predominantly used, with 75% of the production capacity. In Japan, the electrolytic cell technique is mostly used, with 90% of production, where in 1984 the chlor-alkali industry stopped using mercury[44]. There is absolutely no doubt that the pollution of Minamata Bay had an influence on this decision.

[43] *Mercury process for making chlorine. Euro-chlor page 2. Available at: www.eurochlor.org/chlorine/publications/mercury.pdf*
[44] UNEP, Global Mercury Assessment, Overview of Existing and Future National Actions, including Legislation Relevant to Mercury. November 2002.

World statistics on the chlor-alkali production capacity show that the central and western regions of Europe are those with the largest relative percentage of world production capacity of chlorine using mercury cells (66 and 61 per cent respectively in 1997)[45]. Figures from 2001 show the clear predominance of mercury cell chlor-alkali production in Western Europe (54% of the chlorine production capacity)[46].

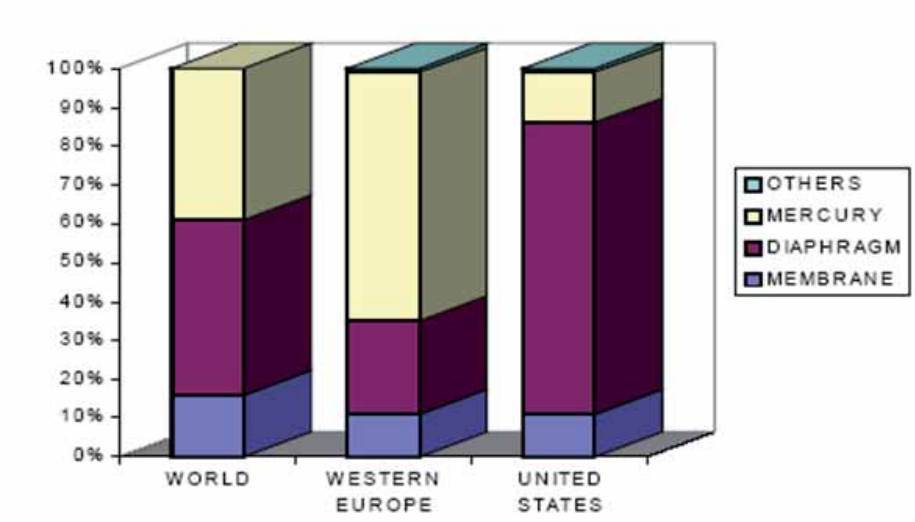

Figure 1: Comparison of the total chlorine capacity in Western Europe, the United States and the world in terms of technology used (Lindley, 1997). Source: Reference Document on Best Available Techniques in the Chlor-alkali Manufacturing Industry, p.5.

The chlor-alkali industry is not only the biggest user of mercury in the European Union but also the most significant[47]. One of the main sources of mercury comes from chlor-alkali production. Despite the fact that it has always been considered that the largest source of mercury emissions were coal-burning installations, chlor-alkali production is the main source due to so-called fugitive emissions. Indeed, the majority of mercury emissions from these installations do not come from emissions into the atmosphere and water or from waste disposal operations, but rather from these fugitive emissions that are neither accounted for nor controlled. Mercury not only evaporates during regular plant operations but also when the tanks are open for maintenance. This is due to the fact that mercury is a very volatile element, and that the facilities where the cells are held operate at very high temperatures[48].

[45] *Global Mercury Assessment*, UNEP-Chemicals, p. 130, párrafo 578, Ginebra, Suiza, Diciembre 2002. Estas cifras provienen de un estudio de Sznopek and Goonan (2000) en el que citan a CMAI (1999). Sznopek, J.L and Goonan, T.G. (2000): The materials flows of mercury in the United States and the world. USA Geological Survey Circular 1197, vers. 1.0, USA Geological Survey, Nov. 2001 (http:// minerals.usgs.gov/minerals/pubs/commodity/mercury). CMAI-Chemical Marketing Association, Inc. (1999): Chlorine, world capacity tables. 11601, Katy Frewy, Number 22, Houston, Tex.

[46] European Commission note 10 ut supra, p.3.
[47] European Commission note 9, ut supra, p.6.
[48] Oceana, *Poison Plants: Chlorine Factories Are A Major Global Source of Mercury*, January 2005, p. 11.

3.1.1. The problem of mercury

Mercury and its compounds are extremely toxic to human life, ecosystems and wildlife. Mercury pollution, which started off being regarded as a serious localised problem, is now perceived as a global, widespread and chronic problem. In high doses, mercury can be fatal to humans, but even in relatively low doses it can cause serious problems in neurological development. Since relatively recently it has also been suspected that it causes damage to the cardiovascular, immunological and reproductive systems.

Mercury is a long-lasting substance and when it comes into contact with the atmosphere it can be transformed into methylmercury, which is its most toxic form. Methylmercury easily crosses the placental and hematoencephalic barriers and can hinder mental development even before birth. This explains why the exposure to mercury of women of fertile age and children raises such enormous concern.

In view of this serious problem, the international community has started making efforts to combat the effects of mercury. In 1990, OSPAR Decision 90/3 of 14 June recommended phasing out the activities of existing mercury cell installations in chlor-alkali production plants as soon as possible, with the aim of achieving the objective of their total elimination by 2010. The recommendation in Decision 90/3 relating to the gradual phasing-out of mercury cells was examined again in 1999-2001, but no amendments were introduced. In the framework of the United Nations Environment Programme, a Global Mercury Assessment[49] was carried out and subsequent to this the Mercury Programme[50] was established.

The EU has resolved to tackle this problem. Following the report that the European Commission presented to the Council on mercury generated by the chlor-alkali industry, the Council asked the Commission to draw up a Community Strategy on Mercury[51], which was presented recently to the Council and the European Parliament. The objectives of this strategy are:

- To reduce mercury emissions
- To reduce mercury movements by restricting supply and demand
- To resolve the long-term problem of mercury stocks and “deposits” (mercury contained in products in circulation or storage)
- To protect against mercury exposure
- To improve understanding of the mercury problem and its solutions
- To support and promote international action on mercury

The Council of the Environment, in its meeting on 26 June 2005, issued its conclusions[52] regarding the Strategy, supporting the Commission in its implementation based on a life-cycle approach, encompassing the production, use, processing of waste and storage until its elimination. The Ministers agreed that mercury exports from the EU to other countries should be banned from 2011. These conclusions indicated that to ensure the application and development of this strategy it will be essential to implement BATs in line with the IPPC Directive with the aim of reducing mercury emissions from combustion processes. Likewise, the Commission was invited to present a proposal relating to the safe storage and disposal of mercury from the chlor-alkali industry consistent with the schedule for implementing the ban on exporting mercury.

Although this Strategy presents certain recommendations for the chlor-alkali sector, the IPPC Directive is the only legally binding instrument that is applicable to this sector. Directive 84/360/EEC also needs to be taken into consideration, which applies to chlor-alkali manufacturing plants in terms of emissions into the atmosphere when there is no integrated permit in place and up to 30 October 2007, when it will be completely repealed by the IPPC Directive[53].

[49] *Mercury Assessment, UNEP-Chemicals, p. 130, paragraph 578, Geneva, Switzerland, December 2002.*
[50] Decisions of the Governing Council 22/4 V of 7 February 2003 which establishes a programme on mercury, and 23/9 IV which agrees to the establishment of partnering for the development of the mercury programme.
[51] COM (2005) 20 final of 28.01.2005.
[52] Available at www.eu2005.lu/en/actualites/conseil/2005/06/24env/mercure.pdf
[53] Article 20, IPPC Directive

3.2. Obligations of the chlor-alkali sector with regard to the implementation of the IPPC Directive.

As seen when analysing the IPPC Directive, we are speaking of a legally binding instrument for all Member States by virtue of which, as from 30 October 2007, all existing installations in all the industrial sectors to which the Directive applies must operate with an integrated permit. The conditions established for this permit should be based on the implementation of BATs; in other words, it should be ensured, by means of the established conditions, that BATs are being implemented.

Consequently, existing installations in the chlor-alkali sector will have to have an integrated permit before 30 October 2007, the conditions of which are based on the implementation of BATs.

It is the responsibility of the competent authorities to determine, case by case, the conditions for authorising each installation in accordance with BATs. The competent authorities have a certain leeway when it comes to establishing these conditions, based at all times on the implementation of BATs, but the specific and expected result of the Directive is clear and unequivocal: the technique on which the determination of the conditions of the permit is based will always have to be one of the best available ones.

3.2.1. Determining BATs for the chlor-alkali industry

In the framework of the Seville process, in 2001 a BREF was adopted relating to the Chlor-alkali Manufacturing Industries. The processes most frequently used by this industry were submitted to an exhaustive examination. The BAT reference document with regard to chlor-alkali production[54] concluded that the BAT for chlor-alkali production is the electrolytic membrane cell process, as well as the diaphragm process without asbestos[55]. At the same time, it indicates that the BAT for mercury cell installations is none other than their conversion to membrane cell technology[56], and that mercury cell installations are not the Best AT[57] (author's italics).

The BREF document indicates that economic benefits would result from the conversion of mercury cells to membrane cells, such as a reduction in energy consumption, a reduction in maintenance operations and the number of staff employed, the sale of mercury and savings as a result of the elimination of measures to combat mercury emissions and medical costs for personnel[58].

As seen when analysing the definition of the BAT concept, the techniques must be developed on a scale that allows their implementation in the context of the relevant sector. The tests to check the nature of the BAT can come from one or more plants that implement them anywhere in the world. Processes based on electrolytic membrane cells are not only used in Japan and the United States but also in a considerable number of plants in the European Union.

[54] BREF nota 5 ut supra. Available at http://eippcb.jrc.es
[55] Reference Document note 5 *ut supra* p. iii y 109.
[56] Reference Document note 5 *ut supra* p. v y 111.
[57] Reference Document note 5 *ut supra* p. 120.
[58] Referente Document note 5 *ut supra*, p. 95.

Table 1.1 shows the distribution of the chlorine production processes in west European countries, indicating the number of installations and the annual capacity of chlorine production.

west European countries	Mercury process		Diaphragm process		Membrane process		Other processes		TOTAL
	number of inst.	capacity (kt)	number of inst.	capacity (kt)	number of inst.	capacity (kt)	number of inst.	capacity (kt)	capacity (kt)
AUSTRIA					1	55			55.0
BELGIUM	5	662			1	120	1 (HCl)	50	832.0
FINLAND	1	40			1	75			115.0
FRANCE	7	874	3	560	2	232	1 (Na)	20	1686.0
GERMANY	13	1762	3	1446	4	844	3 (HCl)	230	4282.0
GREECE	1	37							37.0
IRELAND					1	6			6.0
ITALY	9	812			1	170			982.0
NETHERLANDS	1	70	1	140	2	414			624.0
NORWAY			1	130	2	50			180.0
PORTUGAL	1	43			2	46			89.0
SPAIN	9	761.5			1	40			801.5
SWEDEN	2	220			1	90			310.0
SWITZERLAND	3	103.5							103.5
UK	3	856	2	220	4	105			1181.0
TOTAL	55	**6241**	10	**2496**	23	**2247**	5	**300**	**11284.0**

NB: Any one plant can have more than one cell technology installed

Table 1.1: Distribution of processes and capacities of chlor-alkali plants in western Europe (June 2000)
[Euro Chlor]

Source: BREF for Chlor-Alkali Manufacturing Industries, p.4.

Determining the BATs involves evaluating the net estimated costs for their implementation in relation to the environmental benefits achieved through their implementation.To do so, consideration should be given to the fact that during the operation of mercury cells, emissions are sent into the atmosphere and water and result in mercury losses that end up in products and in the form of waste.

The European Commission has indicated[59] that a second economic test consists of establishing whether it is economically viable to introduce the technique in question in the relevant sector. In order for it to be acceptable, this test should be carried out at European sectoral level[60] instead of circumscribing it to specific installations. If the techniques are considered to be too expensive for the sector as a whole, then they should be ruled out as BATs.

The chlorine industry contributes 60% of the total profits of the chemical industry, currently at a figure of 380,000 million euros[61]. According to a study made by the SRI Consultancy in 1997, the total value of chlor-alkali sector production in Western Europe came to 300,000 million euros. This consultancy estimated that the profits generated by products associated with the chlor-alkali industry reached a figure of 230,000 million euros in 1995[62]. The industries associated with Eurochlor achieved 240,000 million euros in 2001[63]. In 2001, Euro Chlor estimated the total cost of conversion at around 3,100 million euros[64]. In view of the economic data of this sector, we can claim that the dismantling of mercury cells is economically viable, as per the definition of “available” for the chlor-alkali sector industry.

[59] European Commission note 28 *ut supra*, p. 15
[60] The concept of “sector” is used here with a relatively high division of activities (thus rather than talking about the chemical sector as a whole, we refer, for example, to the sector dedicated to manufacturing chlorine and caustic soda).
[61] Eurochlor en www.eurochlor.org/chlorine/issues/mercury.htm
[62] BREF on B AT in the Chlor-Alkali Manufacturing Industry (December 2001), p. 2.
[63] Euro Chlor, *The European Chlor-Alkali Industry: on the move towards sustainable development*, Brussels, January 2002, p. 7.
[64] European Commission note 10 *ut supra* p.4.

Between 1985 and 2000, the chlor-alkali industry acquired considerable experience in dismantling mercury cell installations, including the closure, dismantling and conversion of plants as well as decontamination of land and waste disposal, in more than 34 installations in Germany, Austria, Belgium, Denmark, Spain, Finland, France, Holland, Italy, Norway, Portugal, Sweden and the United Kingdom[65]. The reasons for this dismantling were, amongst others, the age of installations and equipment, regulatory pressure, safety considerations and excessive production costs.

According to Euro Chlor, between 1982 and 1995 a total of 1.95 million tons of mercury cell chlorine production capacity were decommissioned or converted to alternative processes, although with considerable variations from one year to the next. Subsequently, Eurochlor announced that between 1990 and 2000, an average of 100,000 tons per year of production capacity from this type of process had been converted or decommissioned[66].

Table 5 - Decommissioned Western European mercury cell chlor-alkali plants

-WESTERN EUROPE (1986-2002)-

DETAILS OF MERCURY CELL CHLOR-ALKALI PLANT CLOSURES OR CONVERSIONS

(this list is incomplete)

Closure or conversion years	Last owner	Est. chlorine production capacity (tonnes)	Country	Location
1986	Akzo Nobel	85,000	Sweden	Skoghall
1990-92	Enichem	129,000	Italy	Montova
1991	Domsjø	35,000	Sweden	Domsjø
1992	Finnish Chem.	45,000	Finland	Aetsa
1993	ICI	90,000	UK	Fleetwood
1993	Soc. Elettrochim.	45,000	Italy	Tavazzano
1993	Elec. Andaluza	24,000	Spain	Ubeda
1994	Octel	75,000	UK	Ellesmere Port
1994	Nob Forss	13,000	Sweden	Koepmanholmen
1994	Enichem	115,000	Italy	Gela
1994	Akzo Nobel	58,000	Finland	Kuusankoski
1996??	Anaconda	20,000	Italy	Saline di Volterra
1996	Borregaard	40,000	Norway	Sarpsborg
1997	Caffaro	32,000	Italy	Brescia
1998	Micro-Bio Ltd.	6,000	Ireland	Fermoy
1998	Solvay	25,000	Portugal	Povoa di Santa Ir.
1998	Solvay	53,000	Austria	Hallein
1998	ECI	65,000	Germany	Bitterfeld
1998??	Vestolit	40,000	Germany	Luelsdorf
1999	Bayer	300,000	Germany	Dormagen
1999	Dow	200,000	Germany	Schkopau
1999	Clariant	60,000	Germany	Gersthofen
2000	Solvay	146,000	Netherlands	Linne Herten
2001	Bayer	130,000	Germany	Uerdingen
2002	Wacker	157,000	Germany	Burghausen

Note: Due to simultaneous modifications and expansions of other Western European operating mercury cell chlor-alkali plants (especially in 1994 and 1997), as well as transfers of mercury to other plants for consumption during routine operations, the quantities of mercury that reached the international market were considerably less than the full inventories represented by these closures.

Source: Euro Chlor (1998, 2001a, 2001b, 2001c, 2002a); personal communication with A. Seys, Euro Chlor.

Source: *Concorde, Mercury flows in Europe and the world: The impact of decommissioned chlor-alkali plants, final report – February 2004, p.12.*

[65] Concorde, *Mercury flows in Europe and the world: The impact of decommissioned chlor-alkali plants* Final report – February 2004, p.11

[66] Euro Chlor, *Reduction of Mercury Emissions from the West European Chlor Alkali Industry*, 3rd Edition, Euro Chlor, Brussels, June 2001.

These considerations were undoubtedly taken into account when it came to drawing up the BREF for the Chlor-alkali Manufacturing Industries, and hence the conclusion not to include the mercury cell process amongst the BATs. The BREF states that conversion is technically viable in all the existing mercury cell plants and that its economic viability may vary from installation to installation[67]. Let us remember, too, that the cost factor is not the only criterion that should be taken into account by the competent authorities when they are making decisions on BATs.

While the BREFs do not impose binding legal regulations, they do offer the competent authorities a point of reference. When the authorities are analysing an application from the operator of a chlor-alkali installation, they should take the conclusions of the BREF into consideration. In the case of the chlor-alkali industry, the competent authority will have to decide, when it comes to establishing the conditions for the permit, to base them either on the electrolytic membrane cell process or on the diaphragm without asbestos process, as these are the best available techniques. It would not be reasonable, but also it would be a non compliance of the IPPC Directive, if we were to find that all the chlor-alkali production installations whose conditions were based on the use of mercury cells had an integrated permit after 30 October 2007. Although we can see that the IPPC Directive allows certain exceptions, these are all temporary. In addition, they cannot be applied to a sector as a whole, but rather to specific installations.

We should keep in mind that the 84/360/EEC Directive, which applied to the chlor-alkali sector, already required Member States to proceed gradually towards ensuring that installations adapted the best available technologies in terms of atmospheric emissions. With regard to the Commission v Greece case, the ECJ's interpretation was that the reduction of emissions by an installation in itself did not give a State carte blanche to not adapt the existing installations to the best available technology. In other words, the Member States were already obliged, prior to the IPPC Directive entering into force, to demand that installations in the chlor-alkali sector adopted the best available technologies.

Consequently, by 30 October 2007, existing chlor-alkali production installations will have to have dismantled their mercury cell based processes.

This conclusion has also been reached by others, although in a different way. Thus the study carried out by the company Concorde for the European Commission, entitled Mercury flows in Europe and the world: The impact of decommissioned chlor-alkali plants puts forward three scenarios for the decommissioning of mercury cells in the EU:

1. The commitment of the chlor-alkali industry to dismantle these cells by 2020;
2. The "strict" application of the IPPC Directive, i.e. that dismantling must take place by 2007;
3. The "flexible" application of the IPPC Directive, i.e. that taking into consideration the technical characteristics of the installations, their geographical location and the local environmental conditions, the competent authorities would not force through this dismantling until October 2010.

We should state here that the first scenario stems from a total lack of understanding of Community Law, given that when there is a binding instrument, as is the case of the IPPC Directive, the industries must respect it. By way of voluntary agreements and self-regulation, they may impose stricter commitments upon themselves than those established by the environmental regulations, but at no time can they fail to comply with them. Therefore this scenario could never happen; otherwise we would find ourselves with a breach of Community Law by an entire industrial sector.

The second scenario continues to show a lack of understanding of the principles of Community Law. Directives are not implemented in a "strict" or "flexible" way; directives should be implemented to achieve an expected result. There is one expected result. The authors of this study have managed to gain a full understanding of the result expected by the IPPC Directive, which is none other than the dismantling of mercury cells by 30 October 2007.

[67] BREF p.88.

With regard to the third scenario, the authors once again base themselves on a mistaken premise. The integrated permits must be granted by the competent authorities for each existing installation. It is possible that we might come across one or two isolated cases where the competent authority, considering the technical characteristics of the installation, its geographical location and the local environmental conditions, gives a deadline later than 30 October 2007 for the total dismantling of mercury cells in a specific installation. But what we will not come across is a generalised form of the third scenario suggested, i.e. that all the existing mercury cell installations in the EU territory are not obliged to dismantle to achieve their integrated permit before 30 October 2007, with the exception of those located in the new member countries that negotiated an extension to their deadlines. In this case, we would be witnessing a block violation of the IPPC Directive by the Member States. The date given in this third scenario is 2010, coinciding with that of the OSPAR Recommendation 90/3. Let us remember that this is only a recommendation; in other words, it does not have any binding legal force; what is legally binding upon the Member States is the IPPC Directive.

The European Commission has declared:

The legal situation governing the mercury based chlor-alkali industry has revealed that:

-The IPPC Directive is the only legally binding instrument that governs the phase-out of mercury cells. The mercury-cell process is not considered to be BAT for the chlor-alkali sector and it will be for the local competent authority to decide on BAT-based permit conditions for individual installations on a plant-by-plant basis. All existing installations should meet permit conditions based on BAT and operate in accordance with the requirements of the Directive by 30 October 2007[68] .

As a corollary to this declaration, it should be added that as mercury cells are not the BAT, the national authorities will not be able to grant an integrated permit to installations that use this technique.

[68] European Commission note 11 *ut supra*, p. 18.

4. Conclusions

The IPPC Directive is a binding instrument for all the Member States. It requires them to reach a specific, precise result, which is that all existing installations have an integrated permit that fulfils the minimum requirements, which includes the implementation of BATs, by 30 October 2007 at the very latest.

The implementation of BATs means that the competent authorities are obliged to demand that operators of installations implement one of the Best Available Techniques. Member States are also obliged to guarantee that the obligation to adapt existing installations to BATs within the deadline envisaged by the IPPC Directive is complied with.

The European Commission, in its role as the guardian of the Treaties, is obliged to watch over the proper implementation of this Directive. Consequently, it will need to ensure that the Member States, through their competent authorities, demand the implementation of BATs in the operations of installations belonging to the sectors to which the Directive applies.

There is no room for doubt: the mercury cell technology used by the chlor-alkali production industry is a technology that cannot be classified as a BAT. Therefore in view of the analysis carried out on the IPPC Directive, the conclusion is that installations whose production processes are based on mercury cells should modify their processes before 30 October 2007 in order to obtain an integrated permit.

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