IMPEL
NETWORK

European Union Network for the Implementation
and Enforcement of Environmental Law

IMPEL Workshop on Licensing and Enforcement Practices in Cement Plants Using Alternative Fuels

11th to 13th May, 1998, St. Veit/Glan, Carinthia, Austria

FINAL REPORT

KÄRNTEN

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This report reflects the standpoint of the IMPEL Network but not necessarily the view of the National Administrations or the Commission."

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Preface

The European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL) is an informal network of the environmental authorities of the Member States of the European Union. The European Commission is also a member of IMPEL and shares the chairmanship of the meetings, and is hosting the Secretariat.

The Network was initiated in 1992. Its objectives are to create the necessary impetus in the European Community to make progress on ensuring a more effective and comparable application of environmental legislation. The Network promotes the exchange of information and experience and the development of a greater consistency of approach in the implementation, application and enforcement of environmental legislation, with a special emphasis on Community environmental legislation. It provides a framework for policy makers and environmental inspectors and enforcement officers to exchange ideas, and encourages the development of enforcement structures and best practices.

Since May 1997 the Network has consisted of: Plenary Meetings, two Standing Committees and ad hoc Working Groups for specific topics.

- The **Plenary Meeting** decides on horizontal and strategic issues, approves the work programmes of the Standing Committees, and agrees on the budget.
- **Standing Committee I** deals with legal policy and legal implementation issues.
- **Standing Committee II** is concerned with technical issues, inspection, practical application and enforcement, environmental management instruments, training/ exchange programmes.
- There are several **Working Groups** under both Standing Committees.
- One Working Group (Cluster B) under Standing Committee I is called **Integrated Permitting**. The Austrian IMPEL Workshop on Licensing and Enforcement Practices in a Cement Plant Using Alternative Fuels is part of this Cluster B.

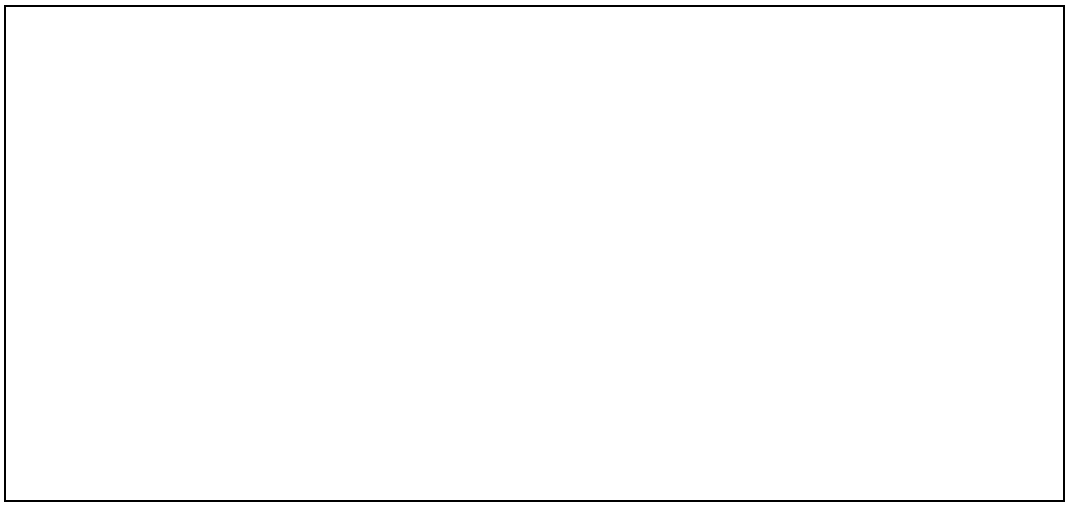
The Network is supported by the **IMPEL Secretariat**, which is hosted by the European Commission. (DG XI. B.3).

The actual workshop was further supported by the Provincial Government of Carinthia, Austria, the Austrian Federal Ministry of Environment, Youth and Family Affairs, the Austrian Ministry of Economic Affairs and the City of St. Veit/Glan, Austria.

Special thanks have to be given to all participants from 11 member states, namely to all contributors, to all members of the preparatory group and to all chairs and rapporteurs, in alphabetical order: Richard Bolwerk, Frank Clinton, David Coulburn, Ed Eggink, Don Litten, Donald Munns, Martin Niederhuber, Waltraud Petek, Ewald Sallinger, Michael Struckl, Michael Theben, Friedrich Willitsch, Gernot Wurm, Axel Zafoschnig, Gabriele Zehetner and Ernst Zenkl.

Carinthia, Austria, August 1998

Wolfgang Hafner, Karin Miklautsch, Gerhard Weihs



Contents

Summary

From 11 to 13 May 1998 an IMPEL Workshop on Licensing and Enforcement Practices in Cement Plants Using Alternative Fuels took place in St. Veit/Glan in Carinthia, Austria. The main objectives of this workshop were to compare the situation in the Member States (MS) and to give an overview on the current and future requirements of the European Union (EU). Additionally the workshop offered the opportunity to discuss the working paper on the incineration of waste and to give feedback to the European Commission (EC).

The current situation in the MS was presented through contributions of the participants from the MS, practically complemented by an excursion to an existing cement plant using co-incineration of plastics waste. Presentations dealing with Best Available Technology (BAT) and the working paper on incineration of waste showed the current and future requirements of the EU.

The evaluation of the questionnaire, which was distributed to all MS in advance, demonstrated among other things that there were great differences in:

- Current ELV´s, particularly NOx and SO_2
- Requirements on monitoring
- Criteria for input material, particularly waste
- Competent authorities and licensing procedure, e.g. trial runs

Details were discussed in **four working groups** under the headings:

- Common approach
- Monitoring and inspection
- emission limit values and mixing rule
- Input waste

The results of the working groups were presented by rapporteurs and discussed in the plenary session.

Based on the outcome of the IMPEL workshop the following main conclusions can be drawn:

- Generally the points of the working paper of the EC on incineration of waste concerning cement industry, which were presented by Michael Theben, were accepted by the participants of the workshop
- The workshop gave a good feedback to the EC concerning the working paper on the incineration of waste, some details will be reconsidered as reported in the final discussion.
- There is no need for the mixing rule, particularly for cement plants using alternative fuels.
- The ELV for SO_2 (and TOC) should be stipulated by national regulations, because these emissions depend on the quality of raw materials used in first instance.
- Trials are often performed in connection with co-incineration of alternative fuels but need definition, standardisation and guidance.
- Monitoring and inspection of sites needs standardisation but the results of the competent IMPEL Cluster should be awaited.
- There is a need to identify criteria for selecting wastes as fuels.
- Unsorted household waste and clinical waste are not suitable for co-incineration in cement plants.
- Follow-up work is required for some outstanding issues, e.g. on the topics trial runs, monitoring and inspection and criteria for wastes as fuels.
- The format of this IMPEL workshop is fitting for many environmental problems and with appropriate organisation can provide valuable feedback to the EC

Although some issues were unresolved the workshop proved to be effective and successful by all participants. The IMPEL Secretariat are convinced that this workshop showed the invaluable benefits of the IMPEL Network.

Project description

Main objectives

Various fuels can be used to provide the heat required for the production process in cement plants. Usually conventional or fossil fuels are used in cement kiln firing: e. g. pulverised coal and petcoke, oil and natural gas. Recently cement plants have increasingly been using wastes as alternative fuels, e. g. used tyres, waste solvents or plastics, to reduce costs. At the same time, the European Commission is working on a directive for the incineration of wastes. One of the main issues of this directive will be the co-incineration of wastes in industrial plants, as for example cement plants.

Due to current differences across the member states, an exchange of information on EU-wide practices concerning licensing and enforcement of cement plants using alternative fuels was though to be a useful starting point. This would enable the IMPEL workshop to be a source of information and be able to:

- Compare and demonstrate differences of national legal requirements for licensing in the MS
- Inform about current and future EU-requirements and discuss ongoing developments (e. g. risk assessment, BAT)
- Compare the existing emission limit values and discuss them
- Discuss the determination of emission limit values for the co-incineration of wastes (e. g. mixing rule)
- Assess co-incineration of wastes as contribution to waste management
- Examine the criteria for the suitability of wastes as fuels for cement plants
- Compare and contrast monitoring and inspection practices
- Discuss the advantages and disadvantages of the co-incineration of wastes in cement plants
- Stimulate common approaches
- Provide feedback to the European Commission on the working paper on incineration of waste

Preparatory meetings

For the preparation of the workshop an expert group was formed.

- A two-day meeting was held in Salzburg (January 26 to 27, 1998), comprising of experts from Germany, Ireland and The Netherlands, with a further two-day meeting in Klagenfurt (April 16 to 17, 1998).
- The purpose of these meetings were to define the main objectives of the workshop, to design the questionnaire, which was to be sent to all member states, to confirm the format of the programme including contributors, working groups, chairs, and rapporteurs.
- A third preparatory meeting of chairs and rapporteurs was held on the evening before the start of the workshop.

Questionnaire

In advance of the workshop the questionnaire was circulated to all member states. It was seeking information on all relevant aspects of cement plants and cement plants using alternative fuels.

- 13 questionnaires were returned (from 12 member states plus Northern Ireland).
- An abstract of this survey was examined and discussed in some detail during the workshop.

A fully evaluated version of the questionnaire is enclosed in the appendix.

Participants

All member states had been asked to participate and to provide no more than two representatives (i.e. one legislative and one technical expert).

- 38 participants attended the workshop from 11 member states.
- Of this number, 18 participants are from other member states except Austria and two participants are from the European Commission (including the European IPPC Bureau) and one from the IMPEL Secretariat.

A list of all participants is enclosed in the appendix.

The Workshop – Programme, Contributions, Working Groups, Results, Final Discussion

The three-day workshop was divided into:

- A plenary session at the beginning to introduce the legislative background in the EU and the BAT for cement plants
- A second plenary session to present the results of the questionnaire and an Austrian case study on cement plants using alternative fuels
- An industrial visit to an Austrian cement plant using an alternative fuel
- A third plenary session to present national case studies from Germany, The Netherlands and United Kingdom
- Four parallel working groups
- A final plenary session to discuss the results of the four parallel working groups and to summarise

The technical programme was complemented by organised visits to see Carinthia's beautiful countryside, its culture and experience its wonderful gastronomy.

The workshop programme with enclosures of abstracts of contributions, the objectives and results of the working groups and the summary of the final discussion are reported below in some detail.

Saturday, May 9, 1998 – Sunday, May 10, 1998

- *Arrival of participants, Registration*

Sunday, May 10, 1998

09.00 *Start for a hike up to a Carinthian alpine hut and mountain*

17.00 *Preparatory meeting of chairs and rapporteurs*

20.00 *Reception by Gerhard Mock, Mayor of the City of St. Veit/Glan*

Monday, May 11, 1998

09.00 *Welcome by Elisabeth Sickl, Environmental Councillor of Carinthia*

09.15 ***Introduction***

Legislative background in the EU – current and future requirements. *Michael Theben, European Commission, DG XI.E.1*

The following key issues have been the driving forces for the Draft Proposal on waste incineration

- The Proposal is included amongst the actions foreseen in the 5th Environment Action Programme, the importance of which is confirmed in Council Resolution 97/C76/01 on a Community Strategy for Waste Management. In addition it will enable the Community to meet its commitment to fix a dioxin emission limit of 0,1 ng/m^3 for municipal waste incineration under the UN/ECE Protocol on POPs signed in June 1998.
- The Proposal seeks to reduce substantially emissions of several key pollutants and will therefore contribute to the achievement of the target contained in the Fifth Environment Action Programme for dioxins and heavy metals. In addition it will provide a coherent methodology for the regulation and operation of non-hazardous waste incineration and co-incineration plants. This in turn should minimise cross-border shipments of waste by removing the economic incentives related to different standards of environmental protection in the Member States.

- There is no consistent approach to the regulation of co-incineration of wastes, for example in cement kilns or combustion plants. This has led to increasing amounts of waste going to co-incineration, for which environmental standards are less stringent than those required for dedicated incinerators.

Elements of the proposed Directive

This Proposal will replace the two existing Directives 89/369 and 89/429 on the incineration of municipal waste. The key elements of the Proposal include:

- The extension of the scope of Community legislation to cover the incineration of non-hazardous non-municipal waste as well as those hazardous wastes which are excluded from Council Directive 94/67/EC on hazardous waste incineration, thus filling the existing gap in Community legislation.
- The introduction of emission limits for plants which co-incinerate waste. For cement kilns the Proposal avoids the mixing rule and sets up fixed emission limit values.
- The updating of emission limits applicable to municipal waste incineration plants and the addition of limits on releases to water in order to substantially reduce the environmental impact of incineration and help achieve emission reductions and air quality targets while preventing a transfer of pollutants to water.
- The requirement that heat generated in the incineration process is to be recovered as far as possible and that residues are to be prevented, reduced, recovered or re-used as far as possible.
- The introduction of an emission limit value for dioxins.

BAT for cement plants. *Don Litten, European Commission, Coordinator, European IPPC Bureau, Seville, Spain*

The IPPC Directive 96/61/EC requires the conditions of an IPPC permit to be based on best available techniques and Article 2 defines this as:

- 'best available techniques` shall mean the most effective ….. to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole; 'available` is ……. under economically and technically viable conditions, taking into consideration the costs and advantages ….. ; and 'best` shall mean most effective in achieving a high general level of protection of the environment as a whole.

Annex IV then lists a number of things to consider when determining best available techniques including low waste technology; and the furthering of recovery and recycling of substances or waste.

An IPPC permit for a cement kiln cannot directly control the off site processes or activities which generate material which is potentially an input to a cement process. All inputs should be considered here rather than just alternative fuels because there are possibilities for recycling other wastes into the cement process, wastes from other processes which can replace necessary raw materials for the manufacture of cement.

The cement manufacturing process itself is energy intensive in that it is necessary to raise the temperature of the mineral raw materials to somewhere around 1400 to 1500 °C and to achieve this a flame of around 2000 °C is typical. These high flame temperatures and residence time within a kiln system lead to an inherently high thermal destruction capability but only for materials passing through the “hot” zone.

The best cement kilns from the energy point of view are operating at around 3000 MJ/tonne fuel energy input (compared to a theoretical minimum of 1800 MJ/tonne) and energy saving remains an important consideration for the industry in terms of overall costs as energy can account for typically 30% to 40% of production costs.

The direct use of wastes in the cement process appears to represent an efficient recovery of energy compared to other energy recovery options. Additionally the incorporation of the residues into product cement clinker leaves no residue disposal problem.

The major key parameters of concern for cement plants are particulates (dust), oxides of nitrogen and oxides of sulphur. Techniques to reduce dust are generally end of pipe abatement, typically either electrostatic precipitators or bag filters and the emission levels achievable by these are more a function of cost and benefit than technical possibility. Because of the high flame temperatures involved and the

necessary oxidising conditions, the cement process is a producer of NOx and techniques to reduce NOx include in process control measures as well as the option to fit NOx abatement on some kilns. It is suggested that the appropriate time temperature window for SNCR does not exist on long wet cement kilns so it may not be a technically available technique for these.

SOx is a different issue in that the alkaline chemistry of the cement process promotes binding of sulphur compounds into the product cement clinker but there is the general problem of volatile substances released from raw materials or fuels added at cool end of kiln. Because of the countercurrent process flow in a cement process, substances released into the gas phase from the incoming raw materials are carried back to cooler regimes and do not pass through the hot zone of the process. This means particular attention might be paid to fuels used in preheating or precalcining where the high temperatures and residence times of the main kiln may be absent.

Typically volatile organic and inorganic compounds may be released depending on the nature of the raw materials fed to the cooler regimes of the kiln system and this begs the question whether the emissions are significant enough to justify specific exhaust gas treatment. Under IPPC this is where the balance of costs and benefits should apply.

One specific example of the reported benefit of burning a waste in the cement process is the burning of tyres as a NOx reduction technique. Tyres can be burned in all kiln systems and are reported to effect about a 25% consequent reduction in NOx emissions for long wet kilns which is particularly relevant where SNCR may not be a technically available option. It is reported that some 6% of EU cement production is carried out using wet kilns.

Critical to the environmental performance of many activities is the stability and consistent quality of raw materials which leads to stable operation of the process. The cement process is no different and the monitoring, blending and control of all inputs to the process remain an important aspect both for quality of the cement product and the emissions that may result from the operations.

Summary. Regulation under IPPC involves consideration of emission techniques according to the costs of implementing the technique against the environmental benefits of doing so judged in terms of impact upon the environment as a whole. It should not matter under IPPC whether a raw material is waste or not, if there are options to reduce emissions then the options must be judged against the bat criteria. It is complementary not contradictory to consider certain minimum environmental criteria for installations where waste from another process is used as a raw material or fuel. For cement plants, not all cement processes are environmentally equal, waste materials can be input to the cement process in a number of ways and there are many release routes to consider.

Presentation of the results of the questionnaire. *Wolfgang Hafner, Department of Environment, Province of Carinthia, Austria*

The questionnaire was prepared by the preparatory group and distributed via the IMPEL Network to all MS. The main objective was to give an overview about the current situation in the MS. In 12 questions we asked for legal background and authorities, project documents for the application, permitted alternative fuels, ELV´s, BAT, public involvement, monitoring, appeal process and fines. Except Denmark, Finland and Italy all MS filled in and returned the questionnaire. The results of the MS were compared with the requirements of the working paper on the incineration of waste. During the workshop and later on by the end of July 98 the participants used the opportunity to correct and complete their questionnaire. The final evaluation is listed in the appendix in all details. It must be stated that the results of the MS can only present the personnel opinion of the national expert, who filled in the questionnaire.

Although the evaluation cannot be taken as an official statement of the MS it demonstrates in general the status quo and some crucial differences concerning the licensing and enforcement practices. As a short summary the main results are highlighted as following:

- in all MS there are laws, acts or ordinances for new and existing plants, most changes require an authorisation and there is a kind of EIA
- there are great differences in the competent authorities, which varies from a local to national level
- every MS requires very detailed project documents for the application, there are no significant

differences

- Many kinds of alternative fuels are used in cement plant, some MS stipulate regulations and limit values for the input material, and some do not.
- There are great differences concerning the ELV´s, particularly SO2 and NO2. Some MS use the mixing rule. All MS fixes the ELV´s in the single licence.
- Most MS have defined a BAT, which can be compulsory or guidelines
- All MS issue a written licence, which can be reviewed under certain circumstances. Some MS require a trial run for a limited period before permitting
- In most cases the public become involved in the permit procedure
- In all MS most of the air pollutants are monitored but with different methods (continuous - discontinuous) and investigators (self-monitoring - monitoring by authority)
- Except in the UK nearly everybody is allowed to appeal against the permit
- There are wide ranges and differences among the MS concerning the legal consequences for non-compliance

11.15 National case studies

Cement plants using alternative fuels in Austria – Importance of cement plants for a regional waste management. *Ernst Zenkl, Department of Environment, Province of Carinthia, Austria*

The paper will give a short survey about waste management in Carinthia, collection of waste and the incineration of plastic-waste in a cement plant in Wietersdorf.

In general the waste management in Carinthia is guided by the aim to **first prevent - reuse - recycle - and then dispose waste.**

The collection of municipal waste and industrial waste in Carinthia is done by licensed collectors. Households and industry have different bins, boxes or bags to separate waste into different fractions:

- glass
- metals
- paper
- non-hazardous biogenic waste and
- **plastics (packaging materials)**

In Austria bins for collecting plastic packaging materials are called „yellow-box". In 1995 **5.800 t** of plastic waste have been collected in Carinthia and the estimation for 1999 is approximately 6.000 t. The plastic waste can be used as an **alternative fuel** in cement plants. But, it is important to notice, that not the total content of the „yellow-box" is allowed for incineration. In order to incinerate plastic waste deriving from the yellow-box the waste has to be **separated** (sorted) and purified. The content of the yellow-box is separated into:

- plastic for recycling (PE/PP plastic, PET -bottles)
- impurities (metals, household waste, etc.) and
- **PFI plastic fraction for incineration (has to fulfil a specific standard)**

The plastic fraction PFI is incinerated in cement plants (in Carinthia W&P can incinerate up to **19.500 t/a**) to provide the heat for cement manufacturing substituting conventional fuels such as petrol-coke, coal, gas.

To maintain the product quality of the cement and to fulfil the environmental standards (especially emission limit values) the quality of the input materials has to be checked and impurities have to be determined.

Limiting values: Especially **chlorine** content deriving from mis-disposed waste (PVC toys) and food residues in packaging materials

Comparison between synthetic material PFI and the previously used conventional fuel petroleum-coke with special regard to the input values:

	Petroleum-coke	**PFI plastic fraction for incineration**
Calorific value	32000 J/g	29000 - 40000 J/g
Sulphur	6-15%	< 0,1%
heavy metals	high (Ni,V)	low

Conclusions:

- The Plastic waste PFI is more favourable than petroleum-coke in terms of calorific value, sulphur content, heavy metal content.
- ***All PFI collected in Carinthia can be incinerated in Carinthia***
- Before plastic waste could be incinerated in cement plants plastic waste was usually disposed in landfills so there are **additional benefits** in using plastic waste in cement plants:
  - **landfill-space can be saved**
  - **conventional fuels can be saved**

The collection, separation, transportation, purification and incineration is financed with appr. 20 ATS/kg (1,5 Euro/kg) of packaging material „green dot".

In Vienna there exist a municipal waste incineration plant and small items of plastic (polystyrene cups, etc.) can be incinerated together with the household waste (increase in calorific value, no oil has to be used to maintain the high temperature).

Carinthia is now in the process of getting a municipal waste incineration plant.

Future outlook:

- Only collection of recyclable plastic
- Incineration of PFI in cement plants or municipal waste incineration plant - using the heat for district heating.

The Use of Waste Plastics in a Rotary Kiln in a Carinthian cement plant. *Gernot Wurm, Department of Environment, Province of Carinthia, Austria*

The plant Wietersdorf of the W&P Cement Factory has obtained the permit to carry out a cement clinker production by the use of waste plastics and tyres as alternative fuel with an amount of 19.500 tons per year in an experimental stage. The main task of this attempt is the substitution of petcoke, which is of environmental interest by its high content on sulphur and the so caused emission of sulphur dioxide. The use of this petcoke concerned the quantity of 10.00 to 15.000 tons per year recently.

Part of the permission are various commitments with quite a number of determinations concerning a measuring program amongst them to study the emission behaviour during combustion of different fuels. This should be carried out by measuring certain parameters in the course of a series of different, defined mixed fuels. Besides this the emission stage of selected observation points around the plant is to be watched over with respect of the public interest of protection of the neighbourhood of and the forest areas surrounding the plant. Part of these determinations is the monitoring and permanent registration of special parameters in the exhausted gas for and the documentation of the composition of the materials that have been fired. On the other hand some parameters are to be measured supplementary with respect of interest of the producer as a fact of quality assurance.

The factory produces cement in a yearly amount of 400.000 tons by application of the Lepol-technology. The precise dimensions of the rotary kiln are 60 m in length and 4 m in diameter, the volume of the exhausting gas is of an amount of 130.000 normic cbm per hour with a temperature of 130° Celsius. Since 1987 there is existing a legal permission for firing a quantity of 3000 tons per year of used tyres and waste rubber. As far a typical daily mixture of fuels consisted of 950 kg petcoke, 3850 kg Polish hard coal dust and 400 kg tyres as an hourly input. The measurements of a stable stage under the precalled conditions was serving as a basic level (? zero?-run) to set in comparison when using increasing quantities of plastics starting with 500 kg (ultimately 1100 kg, 1400 kg and 1705 kg per hour to realise mostly ?unfavourable? conditions) and a constant dosage of 300 kg per hour of tyres.

Part of realising the project was a plant of pre-treatment for the plastics which consists of visual assorting the delivered material. The provenance of the waste plastics is the so-called ?4. waste-pin? for collecting packaging materials made of plastics alone or as a composite material. The requirements for the input into the firing device amounts to a particle size of not more than 10 mm. As the input conditions for the secondary by-fired tyres were not changed, these alternative fuels are to be carry in on the whole, due to the Lepol-technology.

The commitments of the permit concerning limits on the emission of air polluting components refer to the substances: nitrogen oxides, sulphur oxides, dust, total organic carbon, vaporous resp. gaseous chlorine and fluorine compounds, the total amount of Cd, Tl and Be, the total amount of As, Co, Ni and Pb, mercury and dioxins/furans. Monitoring is to be done on the parameters sulphur oxides, nitrogen oxides, carbon monoxide, dust, remaining oxygen, temperature and the volume of the exhaust gases. A further stipulation lays down that the input of the granulated plastics into the firing device must not be carried out before the rotary kiln has reached its operating temperature. In addition to that the supply of the kiln with plastic material is to interrupt intermediately in case of breakdown.

The measurements laid down in the permit have been performed in a measuring campaign during a period of 7 days and were accompanied by surveys made by the measuring group of the authority. Summarising the results it became evident, that the use of waste plastics as an input material instead of common fuels caused no detrimental changes due to the behaviour of the emissions of the production of cement clinker. The expected reduction of SO_2 as a result of the substitution for the petcoke was proved conclusively. Beyond that a distinct trend towards an improvement of the emission status was

recognisable in that manner, that there resulted an equalisation of the emission values of the various parameters. You can attach this observation obviously to the homogeneous state of the firing conditions in the rotary kiln as a consequence of the material chopped to equal-sized particles.

As a matter of fact it was to be seen that the influence of the combustion of tyres was of respectable evidence. It must be recognised that the throw-in point for tyres is situated in the secondary part of the rotary kiln, where the firing conditions are not as sufficient to destroy all carbon compounds to CO2. In addition to this constructional fact of the technical device peaks of carbon hydrates occurred in the registration of HHM correlated to the input of tyres. The substances of interest in the detected pattern belong to the group of the BTEX-fraction with benzene as the most important representative due to its toxicological relevance.

It was pronounced that the content of chlorine of the plastic material could be not higher than 0,5 % of mass. Permanent measurings of Cl of representative samples of the delivered plastics lots showed, that the mean content of chlorine is lying at 1,5 % (range 1,1 to 2,0 %). A distinct prescription in the permit longs for the investigation of the fate of Cl during the process and should give an answer about the chemical structure the chlorine is bound, esp. the distinction between inorganic salt-like compounds and organic chlorinated compounds.

The results of the measurements and other evaluations during the pilot working period represent the basis for the aspired definitive permission. The so far known data do not signify, that the combustion of waste plastics in a rotary kiln will cause any negative impacts to the environment but leads to a reduction of emissions especially when it is possible to substitute a fuel with unfavourable emission values. This result should not indicate that the co-incineration of any waste by industrial thermal processes will be desirable but shows that well-defined shares of waste materials could have their position as a fuel substitute with respect to fulfil certain standards of quality.

12.45 Lunch break

15.00 ***Industrial visit of an Austrian cement plant using alternative fuels***

Introduction by the operator of the Wieterdorfer & Peggauer Zementwerke

Visit of the cement plant in small groups

18.00 Evening programme: Visit of the Heinrich Harrer Museum

Dinner in a typical Carinthian rural restaurant

Tuesday, May 12, 1998

09.00 ***National case studies***

The Use of Alternative Fuels in the Cement Industry – Regulation in Germany. *Richard Bolwerk, County of Münster*

Past experiences have shown that the cement industry can play an important role in the utilisation of secondary fuels. Key factors include favourable conditions inside rotary tube kilns, optimised process and safety technology and improved exhaust gas cleaning systems.

The requirements differ for each plant and these must be examined and defined as part of the licensing procedure in accordance with the Federal Emission Protection Act (BImSchG).

A environmental compatibility test is compulsory if the project has to be made public and could have disadvantageous effects on human beings, animals or plant life, soil, water, air, the climate or the landscape - including any interactive effects - or on cultivation and property. In these cases the application for a licence must be accompanied by a description of the local environment and its features including the anticipated effects of the project on the above mentioned factors which require protection.

As an essential component of the environmental assessment analysis (UVU) is the determination and evaluation of the background with help of limit values and guide numbers as well as the investigation of the harmful effects of pollutants in the plant's sphere of influence.

The kiln input control is an essential factor for effective emission limits. Considering the trace elements, which are permissible at heavy metals and other pollutants, the trace elements have to be checked with help of the actually used primary energy (coal) in the plant so far.

The cement work operator has to get things straight concerning the utilisation ways and products already considerable before the delivery of alternative fuels to the cement work. Several aspects have to be taken note of in an authorisation application when using alternative fuels:

- Description and assessment of the production process in which waste fuels occur
- Description of the production residues which are a possibility for a utilisation
- Documentation of the utilisation way of the production plant about the processing activity's plant to the cement work
- Description of the processing activity's steps or the bringing together of single materials to a completed secondary fuel
- Data and values of single materials of the total mixture
- Data and values of the completed secondary fuel
- Description of the quality fuse of the secondary fuel

The public authority prescribes an authorisation in a specific isolated case that examinations are necessary and which proofs have to be produced in an isolated case.

The application for a licence must give a comprehensive specification of the operating requirements for the cement kiln plant for ensuring safe combustion of the residues, together with an description of the necessary operational measures with regard to the following criteria:

- Calorific value and added quantity (kg/h) of substitute fuel,
- Pollutant content (PCB, Chlor, heavy metals, etc.)
- Information on the identity of the material used
- Chemical, physical-chemical, toxic and ecotoxic properties of the material
- Combustion conditions and destruction efficiency
- Recirculation systems leading to concentration
- Possible ways of purging material and relieving the recirculation systems
- Operating processes with cut-offs (CO cut-off)
- Effect and type of exhaust gas cleaning processes

Potential faults in the combustion process that could interrupt or alter the flow of material through the cement rotary tube kiln, are to be documented in detail. Where recirculation processes are necessary, plausible descriptions must be given of measures for preventing increased emissions, e. g. by way of strategic material purging.

All operating processes must be designed specifically for low emissions and be monitored particularly carefully by recording suitable process variables. It follows that:

- The burning process must be monitored continuously when using modern process control technology.
- Waste materials require fixed inspections on arrival and comprehensive preliminary homogenisation. Liquid media are sampled continuously through trickle tubes for quality control.
- The main parameters for analysis of the waste material (calorific value, chemical composition, etc.) must be input into the process control system on a semi-continuous basis.
- The feed lance must be designed so that the waste fuel is injected centrally and is ignited at the flame front of the main fuel.
- The control units must allow the waste fuel to be supplied independently of the main fuel.
- Waste fuel may only be supplied during normal continuous operation within the rated output range

The resulting deviations from normal operation must be recorded and documented by continuous measurement. The following data should be recorded:

- Oxygen (O2), Carbon monoxide (CO), Total organically combined carbon (C), Temperature of clinker at kiln outlet, Temperature of kiln gas at kiln inlet, Negative pressure before the exhaust gas fan, Dust, Sulphur dioxide (SO2), Nitrogen oxides (NOx)

In Germany prescribed regulations are applied when using wastes in cement works (17. BImSchV - 17. Verordnung zum Bundes Immissionsschutzgesetz) which reduce the limiting values of emissions

especially for dust and trace elements partly considerable beyond measures so far.

The limiting values of dust are dependent on the height of the energy substance rate between 15 and 25 mg/m³ of exhaust gas. Since the volatile trace elements are tied to dust, the reduction of dust concentration is combined with a decrease of emission of trace elements.

The substance mercury is an exception. Therefore the input examination has to be taken note of in particular and it is restricted that it has no means for the pollutants.

The limiting of emissions for the slight volatile mercury is 0,05 mg/m³, for the elements thallium and cadmium is the amount also 0,05 mg/m³ and for the elements antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel, vanadium and zinc altogether 0,5 mg/m³.

Other limitings are registered for gaseous harmful substances. Emissions of particular dioxins and furans, which are determined as a total value in the German Protection Act (17th BImSchV), cannot exceed the limit value between 0,05 and 0,1 ng/m³.

The Netherlands. *Ed Eggink, Province of Limburg*

In the Netherlands the only plant where clinker is produced is located in Maastricht. The production capacity is 0,9 mln. ton clinker per year and 1,6 mln. ton cement per year.

Cement plants need permits according to the Water Pollution Act, the Environmental Protection Act and a building permit that only can be issued after a positive decision about the request for a permit based on the Environmental Protection Act.

The plant in Maastricht had relatively high emissions of SO2, NOx and dust. Because of its location, not fare from living areas in Maastricht, and because of the environmental policy of the province emission reduction was necessary. Emission goals were formulated in 1993. For the year 2000 the emission goal for SO2 was set on 100-200 ton/year; for NOx on 1250 ton/year and the maximum concentration of dust in the flue-gases of the kiln should not exceed 25 (later 10) mg/m³.

In 1996 additional targets were formulated for the emission of other air pollutants.

The vicinity of another cement factory, less than 10 km. away in Lixhe in Belgium that could operate under less strict conditions complicated the negotiations.

In 1993/1994 the company asked for permission to use alternative raw materials and alternative fuels in their process.

This was negotiated under the following conditions:

- input of dangerous waste will not be allowed;
- the emission reduction has to be implemented independent of the use of alternative fuel and raw material;
- the use of alternatives must not have negative effects on the emission. AN environmental impact assessment is necessary;
- the results must lead to a new and revised permit.
- After long negotiations and under political pressure, the company agreed in 1995 with long negotiations conditions.

The EIA process started in October 1995. The permitting procedure started in July 1997 and was finished recently. Resulting in a permit in which the input of 1007 and was finished recently. Resulting in a permit in which the input of alternative fuels is restricted; maximum emissions are defined from an environmental point of view and the mixing rule is not applied. In the permit it is also stated that a yearly report on BAT is required.

During the procedures much extra attention was paid to communication with communities (NL and B) and NGO's. This resulted in acceptance of the resulting emission reductions. Also the company started open communication with these parties.

The use of alternative fuels and raw materials is limited.

It was already allowed to use glycolbottom, flexicokes and petrocoke as alternative fuels. After extensive testing and judging the effects on the emission it is also allowed to use sludges, rubber-chips, some kinds of synthetic material and dried animal manure as alternative fuel or raw-material.

For each new substitute an extensive report on the emission-effects and a written permission of the province is required. In general every waste material that is re-usable and dangerous wastes are not allowed to use as a substitute.

The permitted emissions are strongly reduced. In the permit is an obligation to the factory to present to the province a yearly report on best available emission- reduction technologies and the applicability in their specific process conditions.

The mixing rule (94/67/EC) was not applied. The reasons are:

- Emissions have to be defined on environmental criteria and not depending on the amount of substituted fuel by alternatives.
- There is no logic relationship between the increase of substitutes and the decrease of the allowed emission.
- The permit is not transparent for the public.
- Complex administration is needed to show relations between input and output of the process.
- Compliance testing is very difficult and enforcement will hardly be possible

United Kingdom: Waste Fuels in Cement Kilns. *Donald Munns, Environment Agency, Bedford*

Logically, the burning of waste fuels in a cement kiln seems a practical solution to disposing of wastes with a calorific value. They can displace the need for the use of fossil fuels, which in sustainable development terms is regarded as CO_2 neutral and which in many instances may be easier to burn than coal or petcoke. However in the UK there has been a massive outcry against such operations and the public want to be more involved in the decision-making process. The Environment Agency of England and Wales has therefore modified its procedures to allow more public participation where trials of such fuels are under consideration. Public meetings have been held and advertisements have been more widely distributed.

Operators now have to undergo a series of rigorous trials when proposing to use such waste fuels. Testing and monitoring is extensive including testing of raw materials and fuels as well as all releases from the process. Consultation is very resource intensive, and not only all test results and an assessment of the effects of any changed releases, but the response to the consultation is placed on public registers, which are open to the public.

Once the Agency has reached a decision about whether to allow trials or the continuous burning of waste fuels, a decision document is prepared, which explains the Agency's answers to all comments received in the consultation process, the Agency's reasons for allowing or rejecting such an application, and any special conditions which may need to be applied. All this goes on the public registers and is subject to public scrutiny.

The Environment Agency has found however that in the large majority of cases that it has been able to approve the use of waste fuels. Where tyres have been used, considerable (up to 25%) reductions in NO_x emissions have been noted, whereas with substitute liquid waste fuels there have been marginal improvements in SO_2 and NO_x releases.

10.30 *Four parallel working groups*

The main objectives of the workshop were discussed in four working groups:

- **Working group A – Common approaches**
- **Working group B – Monitoring and Inspection**
- **Working group C – Emission limit values and the mixing rule**
- **Working group D – Input waste Wastes as fuels**

Below you will find a short description of each working group and the main results gained (transcription of plenary presentations).

<u>Working group A</u> – Common Approaches (Chair: *Waltraud Petek, Austrian Federal Ministry of Environment, Youth and Family,* Rapporteur: *Michael Struckl, Austrian Federal Ministry of Economic Affairs)*

The proceedings for licensing, especially for the setting of ELVs and other conditions are not always transparent and comparable amongst member states. Moreover, the application of an integrated approach brings about new challenges and problems. The participants of the working group shared their experience in regulating and licensing of cement plants and discussed areas of improvement for existing EU or national legislation within the **framework** of:

- the IPPC-directive and the establishment and application of BAT
- the results of the workshop questionnaire
- and the EC-directive on the incineration of waste (draft proposal)
- Could improvements be facilitated by a common approach?.

The **objective** of this working group was to find concrete conclusions for elements of a common approach. In detail **the following issues were addressed:**

- Need for a common approach
- Possibilities and areas for a common approach
- Stimulation by EU or IMPEL activities
- Important elements for a common approach

General views agreed upon by the working group:

- Regulations for pollutants from the conincineration in cement plants are based on different starting positions in the member states, but
- there are pollutants which are independent because of local differences; they should be identified, which should be stimulated by the EU on IMPEL.
- Setting limits through the EU would help to attain more transparency in the implementation and for the justification of certain measures on national level and also for the choice of instruments for environmental strategies

According to the subjects of the questionnaire, which were of relevance for discussion, the working group saw **a need for a common approach** especially for the topics 'Legal background', 'BAT', 'authorisation & licence'. The members of the working group proposed concrete measures and recommendations for a common approach at an European level for:

Licensing

- In member states where permits are issued for the use of alternative fuels in cement plants it is common to require that trial runs are carried out. Therefore an information exchange about the performance and results of such trial runs at an EU/IMPEL-level would be very helpful. A Standardisation of the performance of trials should be considered, maybe, but not agreed by all participants, either in the form of an IMPEL paper or even as regulatory elements in EC-directives.
- The use of alternative fuels always requires a permit for the change. This should be regulated by the local or national authority.
- Connections to the IPPC-Directive (Art. 1 (10b), Art. 12 – 'substantial change' must be taken into account.

Decision-making standards/BAT

- BAT is already a common approach concept, but it needs some form of national implementation in a practical sense.
- In relation to BAT-Directive: A directive sets minimum standards, but does not specify BAT or replace BAT-document elements (see Art. 18 IPPC-Dir.)
- Standards/regulations should be considered within overall frameworks (waste management strategies)

Control measures

- Periodic permit reviews are essential and should be performed in-depth
- The relation between trial-review could be clarified
- The reviews could be supported by periodic reports from the companies

It was agreed that **no common approach was needed** in regard to 'Authorities and legal bodies', 'Appeal processes' and 'Legal consequences' due to inevitable variation in national legislation from one MS to another.

<u>Working group B</u> – Monitoring and Inspection (Chair: *Karin Miklautsch, Department 8W, Province of Carinthia,* Rapporteur: *Frank Clinton, Environmental Protection Agency, Ireland)*

Within this working group monitoring and inspection practices for cement plants using alternative fuels were discussed. Environmental monitoring and inspection in member states are generally carried out at different levels, by different bodies and in different ways. These are the main elements of good enforcement practices and are essential to ensure the proper implementation of an application or a licence.

The **points of main interest**, which have been discussed in this working group are measurement requirements, sampling periods and parameters, comparison of self-monitoring practices, immission/emission control, input control: inspection analysis and process control.

In this respect the members of the working group made each other familiar with different practices in member states, discussed the advantages of the individual systems, highlighted problems and also introduced innovative ideas.

The principal targets of the working group were:

- to define **must, should and could** criteria
- to determine a monitoring approach which discriminates between continuous and discontinuous measurement
- and between self monitoring and monitoring by the regulatory authority.

The **results** are shown in the following tables:

Stack Emissions Monitoring

	Must	**Should**	**Could**
Continuous	Reference Conditions (Oxygen, Temperature, Pressure, Moisture, Volume) NOx, Dust, CO	TOC SO2 HCl	 CO2
Discontinuous	TOC, SO2, HCl Heavy Metals Dioxins PAH (Tyres), BTXE (Tyres)	Inorganic Cl HF Halides	CO2 Odour, Noise Beryllium (Be), PCB's
Footnote 1: All appropriate monitoring should be carried out by company Footnote 2: Check monitoring and/or validation should be done by authority Footnote 3: CO2 controls will depend on National restrictions in individual MS			

Environmental impacts (immissions)

	Must	**Should**	**Could**
Continuous	None	Dust (inc. $P.M._{10}$), SO2, NOx	None
Discontinuous	None	Noise, Soil (dioxin + Heavy Metals), Vegetation	Odour, Biological sampling (milk)
All these parameters must be monitored by either (or both) the company and/or the Authority – depending on legal requirements in the MS.			

Process Control

	Must	**Should**	**Could**
Continuous	Raw Material mass flow and quality[1, 2] CO-trips (Arises occasionally only – all cases must be logged)[2] Alternative fuel ratio[1, 2] Temperature[1, 2]	None	None
Discontinuous	None	None	process water raw gas – total dust
Footnote 1: Has to be done on an on-going basis by plant operator.			

Footnote 2: All appropriate monitoring should be carried out by company.

Fuels

	Must	**Should**	**Could**
Continuos	Mass flow + quality of alternative[1] Fuels (S, CI, HM, Hg, Cd, PCB etc...) Alternative fuel ratio[2]	None	None
Discontinuous	Mass flow + quality of conventional fuel (S, Cl, HM, calorific value, Hg, Cd, etc...)[1, 2]	None	None
Footnote 1: Has to be carried out by the operator for process reasons. Footnote 2: All appropriate parameters should be monitored by the operator.			

Output Control

	Must	**Should**	**Could**
Continuous	None	None	None
Discontinuous	None	Leachate control for solid waste(s)[1, 2]	Clinker: HM, Dioxins, PCB[2]
Footnote 1: All appropriate monitoring to be done by operator. Footnote 2: Check monitoring and/or validation should be done by authority			

Water

	Must	**Should**	**Could**
Continuous	none	none	none
Discontinuous	HC, pH, conductivity, suspended solids[1, 2]	none	none
Footnote 1: All appropriate monitoring should be carried out by the company Footnote 2: Check Monitoring and/or validation should be done by authority			

Inspection

Minimum criteria for environmental inspections are being worked out by an IMPEL Cluster under Standing Committee 2. The results of this Cluster

- should be assessed when finalised,
- are broadly endorsed by this working group,
- could be tailored to fit for use in cement plants using alternative fuels.

Recommendation

- Follow-up by IMPEL (possibly by questionnaire)

<u>Working group C</u> – Emission Limit Values & Mixing Rule (Chair: *Ed Eggink, Province of Limburg, The Netherlands,* Rapporteur: *Martin Niederhuber, Austrian Federal Ministry of Environment, Youth and Family)*

The setting of emission limit values (ELV) and the using of the mixing rule (Annex II of the Directive 94/67/EC) are different in the member states.

Within this context the **targets of the working group** were:

- Exchange of experiences on emission limit values (ELV) and application of BAT in the Member States
- Exchange of experiences on the application of the mixing rule
- Conclusions

Overview on ELV-discussion

- **SO_2**: The biggest source of SO_2 emissions is from the raw materials.
- **Dust**: The EC proposal of 30 mg/m³ is acceptable.
- **Heavy metals, HCl, HF** were not discussed; the EC has already reached a compromise with Cement Industry (see contribution of Michael Theben), which seemed to be acceptable.
- **NOx**: Although it was discussed no firm conclusion was reached; EC proposal: 500 – 800 mg/m³.

Dust

- Reduction of dust is important because of its content of heavy metals.
- From a technical point of view very low dust emissions are possible (NL 10 mg/m³); finally it is a question of cost.
- EC proposal of 30 mg/m³ seemed to be acceptable.

SO_2

There exist great differences in sulphur content of raw material between member states.
The discussion lead to three **proposals**:

- Fixed ELV; secondary measures
- ELV just for waste; sulphur from raw material excluded
- ELV in relation to mass flow (high mass flow => low ELV and vice versa) ????????????

or the following **compromise**:

- Sulphur in the waste alternative fuel may not exceed the sulphur content of the replaced fuel.
- ELV of 400 mg/m³, authority may grant exemptions under certain conditions (to be worked out).
- Future development: National emission ceilings for SO_2 and NOx.

BAT

- Different approaches existed in the Member States on the interpretation of BAT, e.g. BATNEEC or State of the art or the precautionary principle.
- National BAT- documents are used as guideline for permitting procedures => importance of local circumstances (ambient air situation, NGOs, political pressure).
- At present there is no strong relationship between BAT and the fixing of ELV.

Mixing rule

- The mixing rule is complicated and open to considerable interpretation, leading to many uncertainties.
- The EC proposal of fixed ELV for cement plants is supported => **no need for the mixing rule for cement plants.**
- Question: Can the mixing rule be deleted in general? What are then the regulations for other branches of co-incinerating industry?

Conclusions

- The IMPEL network can be used to get information and provide guidance for permitting procedures.
- Therefore the workshop was useful to have an overview, where there are licensing procedures for cement plants at the moment in the Member States.

<u>Working group D</u> – Input Waste (Chair: *Ernst Zenkl, Department of Environment, Province of Carinthia,* Rapporteur: *Angelika Brunner, Department of Environment, Province of Salzburg)*

The aim of this working group was to define criteria for waste used as an alternative fuel and to identify limitations concerning the quality, polluting constituents and the calorific value. Also quality control and monitoring would be investigated.

The participants discussed the **need for standardisation** within the framework of the following issues:

- Reduce environmental impact of co-incineration in cement plants.
- Enforce environmental benefits where alternative fuels are used.
- Should there be a list of allowed alternative fuels (positive list)?
- Waste policy arguments/criteria vs. technical arguments/criteria.

The working group agreed, that

standardisation is necessary for

- technical reasons: to ensure that the same process controls and monitoring are imposed

- waste policy reasons: protect waste treatment infrastructure

regulations should be
- clear and simple
- made transparent to the applicants/public

standardisation might
- depend on specific regional differences (raw material composition, ecologically sensitive region etc).

The **overall aim** should be when alternative fuels are being burnt that there will be overall environmental benefits. Also any alternative fuel must meet **key criteria**.

Concerning waste composition and properties standardisation should cover the following parameters:
- Heavy metals (Hg < 1 ppm, and Cd and Tl to be as low as possible)
- Sulphur
- Nitrogen
- PCB, PCDD/F
- Halides (Chloride content maximum of 2 %)
- Water content
- Calorific value

Key criteria would be essential for any waste being proposed as an alternative fuel:
- Waste must be homogenous (physical and chemical composition).
- Origins of waste must be traceable.
- Must be capable of being fed in a controlled manner to ensure good combustion.
- Must be able to meet a specification and be monitored.
- Must have a positive fuel value (> 15 MJ/Kg has been suggested but further investigation is needed).

This means that e.g. **no household or clinical waste is suitable for co-incineration** but under some circumstances sewage sludge or used oil could be suitable.

Process control
- Not during start up or unstable firing conditions; preferably through the primary burner.
- Monitored trials should be compulsory for all proposed alternative fuels.

Limitations
- **Any limit-setting** depends on the technology of the kiln and the way waste is applied (e.g. primary burner).
- **Alternative fuels** should not contain any radioactive substances, PCBs/PCDD/Fs or explosive materials.

12.30 Lunch break

14.30 Four parallel working groups to continue

17.00 Meeting of chair and rapporteurs (Evaluation of results of the working groups and preparation of the report)

20.00 Reception by Elisabeth Sickl, Environmental Councillor of Carinthia, in Schloß Albeck

Wednesday, May 13, 1998

09.00 Presentation of working groups (see above)

10.30 Final discussion

In the final plenary discussion all participants of the workshop agreed with the results of the working groups.

An important contribution was made by Michael Theben, who assessed the workshop from the point of view of the EC. Concerning the **working paper on the incineration of waste** he highlighted that:
- there has been more agreement than criticism
- the mixing rule for NOx is to be deleted (and a review on other substances considered)

- measurements for PAH should be reconsidered
- that the working paper should include reference to trial runs
- ELV´s for TOC and SO_2 should be stipulated by competent authorities or MS
- the workshop has given rise to many useful ideas which will assist in the completion of the working paper

At the end David Coulburn presented ad hoc a novel abatement system under construction at a cement plant in the UK. The abstract of this contribution is enclosed below.

In general the workshop was seen as a good opportunity to compare the situation among the MS. Although some issues remained unsolved the workshop was considered to have been very efficient and successful. A follow-up meeting and/or follow-up questionnaire was suggested on the topics 'trial runs', 'monitoring and inspection' and 'criteria for wastes used as alternative fuels'.

12.00 End of workshop

A novel abatement system under construction at a cement plant in the UK.

David Coulburn, Environment Agency, Preston, United Kingdom

Carinthian Environmental Training and Information Center

IMPEL NETWORK

European Union Network for the Implementation and Enforcement of Environmental Law

natürlich kärnten
Umweltschutz Land Kärnten

IMPEL Workshop on Licensing and Enforcement Practices in Cement Plants Using Alternative Fuels

11th to 13th May, 1998, St. Veit/Glan, Carinthia, Austria

QUESTIONNAIRE

Evaluation

Various fuels can be used to provide the heat required for the process in cement plants. Usually three different types of conventional or fossil fuels are used in cement kiln firing: pulverised coal and petcoke, (heavy) fuel oil and natural gas.

But also the **co-incineration of non-conventional fuels, so called alternative fuels (especially of waste)** in cement plants has recently been under permanent discussion. There exist great differences in the basic legal requirements as well as in the implementation and enforcement across the Member States. The objective of this questionnaire was to gather information and to describe the situation in the Member States as well as to compare the results with the proposal for the EU-Directive on the Incineration of Waste (working paper, Nov 97, updated after the workshop in the version March 98).

Evaluation by Wolfgang Hafner and Gerhard Weihs

Return of completed questionnaires

Table 0	questionnaire returned	Responsible persons	Institution
Austria	yes	Angelika BRUNNER	Province of Salzburg, Department of Environment
Belgium, Walloon Region	yes	Paul RACOT	General Directorate of National Resources and Environment -DPPGSS
Denmark	no	----------	----------
Finland	no	----------	----------
France	yes	Isabelle SOENS	Ministry for Spatial Planning and Environment
Germany	yes	Richard BOLWERK	County of Münster, Bezirksregierung Münster
Greece	yes	Vassiliki TRYFONA-PANAGOPOULOU Dimitra KAKAVETSI	Ministry of Environment - Physical Planning and Public Works
Ireland	yes	Frank CLINTON	Environmental Protection Agency, Dep. For Integrated Pollution Control (Licensing & Control)
Italy	no	----------	----------
Luxembourg	yes	Pierre DORNSEIFFER	Administration of Environment, Air/Noise Division
The Netherlands	yes	Ed EGGINK	Province of Limburg, Dep. of Environment
Portugal	yes	Jose Leonel CARVALHO	Portuguese Environment Ministry, General Environmental Inspectorate
Spain, Catalonia	yes	Enric ELIAS	Waste Agency, Ministry of Environment of Catalonia
Sweden	yes	Per JUNKER, Mikael LUNDHOLM	Swedish Environmental Protection Agency
United Kingdom	yes	Donald MUNNS	Environment Agency, Process Industry Regulation
UK - N. Ireland	yes	Kenneth LEDGERWOOD	Environment and Heritage Service, Dep. Of Environment (N.I.)

1. Legal background

Which national laws and regulations are essential to obtain a licence for cement plants using alternative fuels in your country?

Table 1 page 1	a) For new cement plants	b) For existing cement plants	c) Which changes (esp. concerning fuels) require an authorisation	d) Is an environmental impact assessment necessary?
Austria	-> Industrial Code 1994 (BGBl. 194 idF BgBl. I 30/1988) Gewerbeordnung 1994, Ordinance concerning the limitation of emissions of air polluting substances in cement plants (BGBl. 63/1993 and BGBl. 85/94) - Zementanlagen-Verordnung -> Waste Management Act - Abfallwirtschaftsgesetz -> Ordinance concerning hazardous wastes - Festsetzungsverordnung -> General Water Act - Wasserrechtsgesetz -> Environmental Impact Assessment Act	The same. Specific regulations for existing plants in the ordinance on cement plants	-> Any relevant changes that might affect the emissions of air pollutants, noise etc. -> Coincineration requires an authorisation.	Yes -> for plants with a capacity of > 300.000 t/year
Belgium Walloon Region	-> Decrees of the Walloon Parliament => relating to stone pits => relating to the wastes => relating to the impact assessment -> Decrees of the Walloon Government => relating to the stone pits => relating to the toxic and hazardous wastes => relating to used oils => relating to the prevention of air pollution from industrial installations	The same.	-> The permits granted by the competent authorities contain the list and the quantity of each waste that may be used in an installation. Every change is submitted to a new permit which may include, if necessary, special regulations for the new kind of waste. -> Beside, a society, which want to treat wastes, had to be first recognise by the Ministry of Environment, before be able to obtain a permit for its installations.	Yes -> Every permit concerning the exploitation of a cement plant is submitted to an environmental impact assessment procedure even if no waste are burned.
France	-> Law N° 76-663 of July 19, 1976 on classified installations for environmental protection -> Law N° 75-663 of July 15, 19975 on wastes disposal and materials recovery -> Decree N° 77-1133 of September 21, 1977 -> National rules: Order of May 3, 1993 on cement plants; Order of October 10, 1996 on incineration and co-incineration of special industrial wastes plants	The same as for new cement plants within different allotted time	Any changes concerning fuels require a local authorisation (a prefect permit ordinance) and any changes which may significantly alter the facts reported in the application for authorisation where the prefect considers that the alteration threaten any danger or nuisance mentioned in article 1 of the aforesaid law.	Yes -> For all types of plants over 5 t / day.
Germany	-> Federal Immission Protection Act (BImSchG) -> Environmental Assessment Act (UVPG) -> Technical Instruction on Air Quality Control (TA-Luft) -> The German Recycling and Wastes Act (KrW/AbfG) -> The 17th Regulation contained in the Federal Immission Protection Act (17. BImSchG)	The same.		-> Plants over 1000 t/day -> by licensing procedures with public involvement by possible disadvantages on human being, animals, soil, air ...
Greece	-> F.I. 1650/86 -> K.M.D. 69269/5387/90 -> P.D. 1180/81 -> K.M.D. 69728/824/96 -> K.M.D. 114218/97 -> F.I. 2516/97	The same.	Any changes from conventional fuels used (coal, heavy fuel oil, etc.) requires new permission under the mentioned legislation.	Yes -> For all plants
Ireland	-> The Environmental Protection Agency Act (1992) and Regulations	The same.	All	Yes -> All cement plants
Luxembourg	Law (1990) relating to inconvenient, unhealthy and dangerous plants („IPPC“) Law (1994) concerning the prevention and management of waste	The same	any changes requires authorisation	Yes -> all types of plants
The Netherlands	-> Water Pollution Act (1 licence) -> Environmental Protection Act (1 licence) -> Building Permit (1 licence)	The same except the Building Permit.	-> Within permitted categories of fuels all changes that have a negative effect on the environment. -> For new fuels outside the permitted categories.	-> Plants with a total combustion capacity of waste > 25.000 t/a -> Plants which combust dangerous waste
Portugal	-> Air Quality Law -> Harmful Incinerator regulation	The same	Harmful products, alteration of process	Yes -> cement plants
Spain, Catalonia	several decrees: 2414/1969 (Dangerous..unhealthy and unpleasant .activities), 839/75 (atmospheric protection), 6/93 (Waste), 323/94 (Waste incineration) Regulations concerning waste are Catalan Regulations	for waste incineration 6/93 and 323/94 are applied	any significant changes such as change in raw materials or fuels require authorisation	Yes -> if there is a final treatment of waste

Table 1 page 2	**a) For new cement plants**	**b) For existing cement plants**	**c) Which changes (esp. concerning fuels) require an authorisation**	**d) Is an environmental impact assessment necessary?**
Sweden	-> For big installations like cement plants that are intrusive to the environment the government is to assess permissibility according to the directives in the Natural Resources Act. -> The government decision is followed by a decision according to the Environment Protection Act in which the national licensing board determines the conditions.	A permit under the Environment Protection Act is sufficient for an existing plant.	All changes that imply that a discharge or a disturbance may change its character or extent normally require a permit. This also apply with respect to a change whereby the installation is operated in a different way from that defined in the existing permit.	Yes -> Every permit application under the Environment Protection Act must be followed by an EIA-document. -> See also comments.
United Kingdom	-> Environmental Protection Act 1990 (Operators must apply for an authorisation to operate a cement plant using the best available techniques not entailing excessive cost (BATNEEC) to prevent or render harmless such releases, having regard to the Best Practicable Environmental Option (BPEO) for those releases to all media.	The same.	Changes in fuel resulting in changes in emissions will require an authorisation to be varied.	Not statuary one, but it depends on trial. A full environmental assessment would be required from preliminary trials of the new fuel.
UK-N. Ireland	-> Industrial Pollution Control (NI) 1997 and associated regulations -> IPC (Prescribed Processes and Substances) Regs (NI) 1998 -> IPC (Applications, Appeals and Registers) Regs (NI) 1998 -> IPC (Authorisation of Processes Determination Periods Order, NI) 1998	The same.	Any change in fuel resulting in either a positive or negative change in emissions requires an authorisation to be varied.	No -> But independent of planning process a detailed environment assessment based on actual trial burns is required.

Comments:

Sweden: The present Swedish system is quite informal in terms of procedural requirements. Instead of excluding minor projects the extent of the EIA should be adapted to the character of the project in question. Sweden has no separate EIA regime but rather integrates EIAs into the standard licensing system. If hazardous waste is used as alternative fuel a separate permit for the disposal of hazardous waste is also required. The permit is given by the County Administrative Board under the ordinance of hazardous waste.

2. Authorities and legal bodies

Which authorities/institutions are competent ...

Table 2 page 1	a) Which authorities are competent to issue a licence or a permit for cement plants using alternative fuels?	b) Which authorities/institutions are competent for inspection and monitoring of such plants?	c) Which authorities/institutions are competent for the enforcement of regulations?
Austria	☒ Regional level => Governor of the Province ☒ Local level => Administrative Authority of the county	The same as left and - concerning waste management -> ☒ National level => Ministry of Environment, Youth and Family => Federal Environmental Agency	The same as in row (a).
Belgium Walloon Region	☒ Regional level => Minister of Environment of the Walloon Region ☒ Local level => The College of Burgomaster and Deputy mayors	☒ Regional level => Division of Environment Police of Ministry of Walloon Region ☒ Local level => Municipal police and Burgomaster	☒ Regional level => Minister of Environment ☒ Local level => Municipal police and Burgomaster
France	☒ Local level => The prefect with services Comments: In France the organisation for environmental protection is centralised. The legislation is the same in all country. The application is made at the local level by the prefect, who is the representative of the government in the department (100 departments in France).	☒ Local level => The prefect with services Comments: The services are the regional directions of industry, research and the environment (DRIRE), which are competent for permitting, inspection and enforcement under the authority of the prefect.	☒ Local level => The prefect with services Comments: see left
Germany	☒ Regional level => Regional authority => Bezirksregierung Comments: Different in the 16 German federal states/regions	☒ Regional level => Staatliches Umweltamt Comments: Different in the 16 German federal states/regions	☒ Regional level => Staatliches Umweltamt
Greece	☒ National level => Ministry for the Environment - Physical Planning and Public Works => Ministry of Development ☒ Regional level => Regional Prefectures	☒ National level => Ministry for the Environment - Physical Planning and Public Works => Ministry of Development ☒ Regional level => Regional Prefectures	☒ National level => Ministry for the Environment - Physical Planning and Public Works
Ireland	☒ National level => Environmental Protection Agency	☒ National level => Environmental Protection Agency	☒ National level => Environmental Protection Agency
Luxembourg	☒ National level => Ministry of Environment	☒ National level => Administration of Environment	☒ National level => Administration of Environment
The Netherlands	☒ Regional level => Province Comments: Only when dangerous waste is used, the province has to obtain a permission for only that part of the activities from the national government	☒ Regional level => Province	☒ Regional level => Province
Portugal	☒ Local level => Municipalities - localisation ☒ National level => Ministries for the Industry and Environment ☒ Regional level => Regional Delegation/Directorate	☒ National level => Ministries for the Industry and Environment ☒ Regional level => Regional Delegation/Directorate	☒ National level => Ministries for the Industry and Environment ☒ Regional level => Regional Delegation/Directorate
Spain, Catalonia	☒ Regional level => Waste Agency & Industry Ministry of Catalonia ☒ Local level => Municipality	☒ Regional level => Waste Agency & Industry Ministry of Catalonia ☒ Local level => Municipality	☒ Regional level => Waste Agency & Industry Ministry of Catalonia ☒ Local level => Municipality
Sweden	☒ National level => Government/National Licensing Board ☒ Regional level => County Administrative Board (hazardous waste)	☒ Regional level => County Administrative Board (CAB) is in the main rule supervising installations, but can transfer the supervision to => ☒ Local level => Municipal Board	☒ National level => Swedish EPA ☒ Regional level => County Administrative Board ☒ Regional level => Municipal Board, Police, Public Prosecutor
United Kingdom	☒ National level => Environment Agency	☒ National level => Environment Agency. Monitoring is subcontracted to accredited laboratories.	☒ National level => Environment Agency
UK - N. Ireland	☒ National level => Industrial Pollution and Radiochemical Inspectorate (IPRI). Comment: IPRI is part of the environment and heritage service - a next steps agency of the department of environment for Northern Ireland.	☒ National level => Industrial Pollution and Radiochemical Inspectorate (IPRI). Comment: IPRI has its own analytical testing team with both mobile and laboratory facilities.	☒ National level => Industrial Pollution and Radiochemical Inspectorate (IPRI)

3. Requested project documents for the application

a) Which project documents are requested by the competent authority for authorising and licensing cement plants using alternative fuels?

Table 3a page 1	Detailed technical description	Plan of buildings and site	List of equipment	Description of the process	Capacity data	Waste management plan	Safety plan	Fuels used	Expected air emission values	Expected noise emission values	Assess-met of the ambient situation	Environ-mental impact statement	Plan for heat recovery	Other
Austria											see comm.	see comm.		see comments
Belgium, Wall.														
France														Danger study
Germany														see comments
Greece														
Ireland														see comments
Luxembourg														impact studies, see comment
The Netherlands														see comments
Portugal														
Spain, Catalonia														test plan
Sweden														see comments
United Kingdom												see comm.		see comments
UK - N. Ireland														see comments

Comments:

Austria: (1) => Assessment of the ambient situation and => Environmental impact statement are obligatory only if capacity is > 300.000 t/year, but usually supplied less detailed for smaller installations, too. (2) Further are requested: => Waste water discharge => Description of working place conditions

France: The environmental study give => Analysis of the original state of the site => Analysis of the temporary and permanent direct and indirect effects of the installation on the environment => Reasons why the project submitted was chosen => Means by which the applicant proposes to eliminate, contain and if possible compensate for nuisances caused by the installation and an estimate of the relevant costs => Non-technical abstract of the study to facilitate public understanding of the information therein.

Germany: Further are requested: => Description of the toxic effect => Specify fuels input data => Background level of air pollution => Immission ascertainment corresponding TA-Luft

Greece: The requested project documents are included in the study of environmental impact assessment.

Ireland: Further the following documents are requested: => Modelling for major atmospheric emissions => Noise information (vibration etc.) => Groundwater data => Waste disposal arrangements (copy of IPC Licence Application Form is available)

Luxembourg: air & noise impact studies (modelling emissions -> immissions) depending on the type of installation, fuels and emissions; environmental risk study

The Netherlands: Explanations to => List of equipment: only most important equipment from point of view => Capacity data: not only production but also raw material, fuel and product storage capacity => Expected air and noise emission values: also reduction measures => Environmental impact statement: only when environmental assessment procedure is necessary (see question 1). – Further the following documents are requested: => Map of ambient situation => Measures taken to prevent soil pollution

Sweden: (1) Further the following documents are requested: => Proposals in general for measures required to prevent environmental effects from the installation (air, water, noise, light, etc.) and proposals as to how the installation should be inspected. (2) Under the Environment Protection Act it is possible to require a waste management plan, safety plan and a plan for heat recovery, if it is of any significance concerning the risk of pollution in the surroundings. This has not been the case regarding cement plants. (3) The EIA should make it possible to do an overall assessment of the impact of a planned installation on the environment, health and conservation of natural resources. In many cases a modification of an establishment (e. g. change of fuel) also need a permit and an EIA.

United Kingdom: Further are requested. => Application to conduct trials required. Comment: No licence would be granted unless successful trials had been carried out following an agreed protocol and a BPEO Assessment and dioxin trail proved acceptable. Two stages are required: (1) Application to carry out trials of new fuel which includes wide public consultation (2) Application to carry out continuous burning with full trials results and full environmental assessment => Dispersion modelling of releases => Monitoring results => BATNEEC having regard to BPEO => Dioxin trail assessment

UK - N. Ireland: (1) Further are requested. => Full specification range of fuels used => Trail burn assessment => Dioxin emission assessment => Dispersion modelling of emissions => Before and After Environment monitoring programme => Electrical interlocks (2) Before a trial with alternative fuels can commence, IPRI is in receipt of detailed proposals and agree duration of trial, percentage fuel displacement, monitoring protocol etc. A fuel suite of continuous monitors must be installed before trial starts. (3) A detailed impact assessment has to be submitted to IPRI after trial is completed. A decision will then be made to permit or not use of alternative fuels as a routine.

b) Which emission parameters must be defined in the project description?

Table 3b – Explanations:
TD = Total dust, TOC = Total organic carbon, HCl = Hydrogen chloride, HF = Hydrogen fluoride, SO_2 = Sulphur dioxide, NO_2 = Nitrogen oxides expressed as NO_2, NH_3 = Ammonia, CO = Carbon monoxide, D&F = Dioxins and furans, Cd = Cadmium and its compounds, Tl = Thallium and its compounds, Hg = Mercury and its compounds, Sb = Antimony and its compounds, As = Arsenic and its compounds, Pb = Lead and its compounds, Cr = Chromium and its compounds, Co = Cobalt and its compounds, Cu = Copper and its compounds, Mn = Manganese and its compounds, Ni = Nickel and its compounds, V = Vanadium and its compounds, Sn = Tin and its compounds, Zn = Zinc and its compounds, Se = Selenium and its compounds, Te = Tellurium and its compounds, PAC = Polycyclic aromatic carbons

Table 3b page 1	TD	TOC	HCl	HF	SO_2	NO_2	NH_3	CO	D&F	Cd	Tl	Hg	Sb	As	Pb	Cr	Co	Cu	Mn	Ni	V	Sn	Other
Austria												s. c.									s. c.		see comm.
Belgium, Wall.																							
France																							Zn
Germany																							see comm.
Greece																							
Ireland																							
Luxembourg																							Se, Te
The Netherlands																							PAC, Se, Te
Portugal																							
Spain, Catalonia																							
Sweden																							see comm.
United Kingdom																							see comm.
UK - N. Ireland																							

Comments:

Austria: (1) These requested parameters refer to the ELVs of the cement-plant-ordinance. (2) Further has to be defined the emission of Be. (3) Further requested data can be: TOC, HCl, HF, PCDD/F, PAH, Benzene, Toluene, Xylene and -> Hg and V, both depending on fuel type (coal or oil).

France: (1) The total of Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + Sn + Se + Te + Zn must be defined. (2) The emission parameters for Cd and Tl must be defined in the case of the project plans on incinerating special industrial wastes. Cd+Tl+Hag must be defined in the other cases.

Germany: Further the following emission parameters must be defined in the project description: PAH, Chlorbenzole, Chlorphenole, Beryllium (Be), Selen (Se), Tellur (Te), Zink (Zn)

Greece: All parameters required by the directive 94/67/EC.

Ireland: To date EPA has only licensed conventional cement plants using conventional fuels.

Luxembourg: in general, all emissions that may occur must be indicated, depending on the type of fuels, raw materials and abatement techniques (e.g. NH_3)

The Netherlands: (1) The question is answered for the present situation. In cases when other raw materials or alternative fuels are to be used, the authority can and will ask for additional specific emission parameters (e. g. the combustion of dried manure from chicken, which is one of the options in the present licence -> ammonia emission). (2) Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and Sn are quantified as a group.

Sweden: (1) The emission parameters may vary between plants and fuels. E.g. for an application which uses tyres the given parameters are required and further the emission parameters of PAH, HC, H2S, Chlorbenzene, Chlorphenol, Zn and Al. (2) The metals are monitored in dust and gas.

United Kingdom: (1) Other emission parameters must be defined depending on fuels, e. g. where tyres are to be the subject of trials, PAHs and Zinc would be tested. (2) Trials must prove that there is no net-adverse environmental effect compared with conventional fuels.

4. Alternative fuels

Which alternative fuels are permitted for use in cement plants?

Table 4 - Explanations:
% AF = share of alternative fuels in mass percentage; HM=Heavy Metals

Table 4 page 1	Synthetic material	Tyres	Waste oil	Solvents	Recycled wood	Domestic waste	Sewage sludge	Refuse derived fuels	
Austria	< 2% Cl	yes	yes	yes	----------	----------	----------	----------	other fuels: plastics, paper sludge
Belgium Walloon Region	max. 120 GJ/h <40% AF	max. 120 GJ/h <40% AF	20-36 GJ/t <40% AF 13 - 50 kt/y <2-6 % Cl	20-30 GJ/t <40%AF <2-6 % Cl	11-15 GJ/t max. 120 GJ/h <40% AF	7-15 GJ/t max. 120 GJ/h <40% AF < 1% Cl	6-15 GJ/t max. 50 kt/y <40%AF <1% Cl	10-20 GJ/t 120 GJ/h <40% AF 80 kt/y <1%	other fuels: 1) all solid and liquid hazardous, Used Water (sewage with organic compounds), Shredder
France	see 1.)	see 1.)	see 2.)	see 2.)	see 1.)	see 1.)	see 1.)	see 1.)	-> other permitted fuel: animal flours (trial)
Germany	<70% AF	<25% AF	<40% AF	<25% AF	<60% AF	no	no	< 25% AF	see comment
Greece	yes	yes	yes	yes	yes	yes	yes	yes	
Ireland	----------	----------	----------	----------	----------	----------	----------	----------	see comments
Luxembourg	no	18.000 t/a	no	no	no	no	no	no	see comment
The Netherlands	and paper, 80.000 t/a max.	and other rubbers 50.000 t/a max.	no	no	no	no	no	no	-> other permitted fuels: see comments
Portugal	15500 kJ/kg 32000 t/a (a1) Cl<2%, HM<2,5% *	23900 kJ/kg 10000 -15000 t/a 12 % AF	36500 kJ/kg 5700 t/a (a2) Cl<2%, HM<2,5% *	21000 kJ/kg 17000 t/a (a3) Cl<2%, HM<2,5% *	no	no	no	no	-> ashes and industry waste as secondary raw materials
Spain, Catalonia	not to date	not to date	not to date	not to date	not to date	not to date	not to date	not to date	no restrictions to any type of waste
Sweden	+ tyres : 12 t/h , <50 % AF <0,5 % Cl < 0,04 PAH	6 t/h max. 25 % AF < 0,5 % Cl < 0,04% PAH	25.000m3/a max Cl 0,5 % max PCB 2 ppm	6.000 m3/a max. 25 % AF max Cl 1,0 %	----------	----------	----------	----------	see comment
United Kingdom	yes	0,6% Cl	yes	21-42 MJ/kg <2% Cl <1800 ppm HM 0,2-0,5%S	yes	yes	yes	yes	-> other permitted fuels: paper, cardboard
UK - N. Ireland		10 % AF		min 23 MJ/kg 25 % AF <2%Cl <1800 ppm HM	----------	----------	----------	----------	see comment
EU - Waste incineration	----------	----------	----------	----------	----------	----------	----------	----------	no limit values, but categories of wastes including mass and range of calorific values shall be explicitly listed in the permit

Comments:

Austria: (1) There exist no legal limitations, the allowed alternative fuels are fixed in the permit. (2) Limitations => ELVs and BAT-assessment.

Belgium, Walloon Region:

1. All Solid Hazardous (CSS): 7 - 12 GJ/t, 44,000 - 180,000 t/a, <40% AF, < 2-6% Cl; All Liquid Hazardous (CSS): max. 21 GJ/t, 22,000-70,000t/a, <40%AF, <2-6% Cl; Used Water: 7-12 GJ/t, 20,000 t/a, <40%AF, <6% Cl; Shredder: max. 120 GJ/t, <40%AF
2. The concentrations of heavy metals may be fixed and applied to all kind of used or potentially used waste. In some cases, the composition may fluctuate due to additional studies or test that are realised with or without the authorities (see values with *).

For example these values are commonly met: Hg 5 - 10 PPM ; Cd 40*- 100 PPM ; Tl 25 - 100 PPM ; Cr 600* - 2000 PPM ; Cu 900* - 2000 PPM ; Co 80* - 2000 PPM ; Ni 200* - 2000 PPM ; Zn 5000 PPM ; Pb 900* - 2000 PPM ; V 200* - 2000 PPM ;...

3. Other substances find at least in 1 permits: Sulphur 3%, PCB 30PPM, halogen compound 2000PPM, nitride 800 PPM.

France: The local authority (prefect) regulates the installation through specific rules to ensure that the installation is harmless to the environment and generates the minimum of risks as regard as alternative fuels. The prefect may determine specific values. 1.) Limit values for chlorine and heavy metal are fixed by the prefect. 2.) for hazardous wastes: if chlorine content > 1%, temperature has to be >1100°C; heavy metal content: Hg < 10mg/kg, Cd+Hg+Tl <100 mg/kg, Sb+As+Pb+Cr+Co+Ni+V+Sn+Te+Se <2500 mg/kg. / It is considered that cement plants are not aimed to incinerate waste <5000 kJ/kg. If so, the calorific value is fixed at 5000 kJ/kg to calculate the % of thermic contribution.

Germany: minimum calorific value is stipulated by the authority, limit values for heavy metals are to be applied in comparison with actual used primary coals (Cd 2,5 -5 ppm, Tl 0,5 2 ppm, Hg 0,5-1 ppm, Sb 15-30 ppm, As 2,5-20 ppm, Pb 50-100 ppm, Cr 30-100 ppm, Co 3-15 ppm, Cu 60-150 ppm, Mn 50-150 ppm, Ni 12-100 ppm, V 5-20 ppm, Sn 5-40 ppm, Be 0,2-2 ppm, Se 1-10 ppm, Te 1-5 ppm, Cl 0,5 %, S 0,2 %)

Greece: Few cement plants are using alternative fuels in small quantities for a trial period. For this period and when used the 94/67/EC emission limits are applied.

Ireland: To date EPA has only licensed conventional cement plants using conventional fuels.

Luxembourg: special conditions for introduction of tyres

The Netherlands: The following alternative fuels are permitted: => Sludge from industrial and domestic waste water purification plants (100.000 t/a max.) => Dried manure from animals (100.000 t/a max.) => waste materials from petrochemical industry, e. g. glycolbottom, elexicoke and petrocoke (no permitted max. values)

Portugal: a1 (synthetics)+a2 (waste oil)+a3 (solvents) are combusted together with a ratio of mixture <25% in 2 kilns; * Hg < 20 ppm, Cd+Tl < 200 ppm - these values are only a draft for permits; Ashes and industry waste are secondary raw materials.

Sweden: waste oil is processed

United Kingdom: (1) Principally => No alternative fuels are permitted unless proved in trials. (2) Concerning ranges of permitted values: => calorific value: not specified but unlikely to go below 11 MJ/Kg for synthetic materials and domestic waste => maximum quantity: not applicable => other specifications depend on trials (3) individual limits for metals and other parameters may be set depending on trail results (4) Only waste solvents and tyres have been authorised to date. (5) Typical values are shown.

UK - Northern Ireland: (1) Only experiences with tyres and solvents. (2) There exist distinct specifications for liquid secondary fuels (waste oil and solvents) concerning viscosity (<300cp), particulates (<6mm), calorific value (minimum 23 MJ/Kg), ash (max. 15%), content of chlorine (maximum 2 %), F+Br+I (max. 0,5%), PCBs (<10 ppm), S (max.1%) and heavy metals (< 1800 ppm). Further there should be no deliberate or inadvertent addition of radioactive substances, biologically active or clinical/medical waste.

EU: Working Paper on The Incineration of Waste, March 1998

5. Air emission limit values

a) Which air <u>emission limit values</u> are <u>significant for the permit</u> of cement plants using alternative fuels?

<u>Table 5a1 – Explanations:</u>

TD = Total dust, TOC = Total organic carbon, HCl = Hydrogen chloride, HF = Hydrogen fluoride, SO_2 = Sulphur dioxide, NO_2 = Nitrogen oxides expressed as NO_2, NH_3 = Ammonia, CO = Carbon monoxide, D&F = Dioxins and furans, PAC = Polycyclic aromatic carbons

(average) values: dav = daily average value, 10dav = 10-day average value, hhav = half hourly average value, hav = hourly average value, 3/6hav = three/six hourly average value, 8hav = eight hourly average value, 10/90mav = 10/90-minute average value, m = monthly, min = minimum, max = maximum

<u>Table 5a1</u> page 1	**TD mg/m^3**	**TOC mg/m^3**	**HCl mg/m^3**	**HF mg/m^3**	**SO_2 mg/m^3**	**NO_2 mg/m^3**	**NH_3 mg/m^3**	**CO mg/m^3**	**D&F ng/m^3**	**Other**
Austria	50 hhav	----------	----------	----------	200 hhav (400 if raw material contains S)	500 hhav (1000 for existing plants)	----------	----------	0,1 8hav	----------
Belgium Walloon Region	34 - 50 dav	49 - 75 dav	20 - 30 dav	3 - 5 dav	600 - 1000 dav	1000 - 1800 dav	----------	----------	0,1 dav	----------
France	35 for kiln in continuous or 50	10 dav 20 hhav	10 dav 60 hhav	1 dav 4 hhav	320 dav 1280 hhav	1200 (dry), 1500 (semi-dry) 1800 (wet) m	----------	----------	0,1 6hav min and 8hav max	
Germany	15-25 dav	yes	10-25 dav	1-4 dav	< 400 dav	< 800 dav	----------	----------	0,05 dav	----------
Greece	yes	---------- --	----------	----------	----------	----------	----------	----------	----------	----------
Ireland	50 hhav	---------- -	----------	----------	400 - 750	1300 - 1800 hhav	----------	----------	----------	----------
Luxembourg	20 dav 50 hhav (97% <40)	30 hhav	30 hhav	5 hhav	100 hhav	800 dav 1600 hhav (97%<960)			0,1 6hav	
The Netherlands	15 dav, 30 hhav 97 % of all hhav below 18	40 hhav	10 hhav	1 hhav	90 kg/h as 10dav, 375 t/a max.	1300 dav, 2600 hhav, 97 % of all hhav below 1560 1250 t/a max	----------	----------	0,1	PAC 0,3 mg/m3
Portugal	77 dav #	50 dav#	10 dav#	1 dav#	315 dav#	1300 dav#	----------	100 dav#	0,1 dav	----------
Spain, Catalonia	10 dav 30 hhav	10 dav 20 hhav	10 dav 60 hhav	1 dav 4 hhav	50 dav 200 hhav	300 ppm dav (616 mg/m^3)	----------	50 dav 100 hhav	0,1	
Sweden	50-150 monthly	20 3hav	2,0 90mav	0,2 3hav	1700 -20 m	400 - 1600 m	----------	362-500 dav	0,1	----------
United Kingdom	40 - 50 dav	20 - 50 dav	10 - 50 dav, 25-60 hhav	1 dav	1200-1500 yearly av hav	1200-1500 yearly av of hav	----------	100-500 dav	0,1	----------
UK - N. Ireland	40-100 dav	20-50 dav	10-50 dav	1 dav	600-1500 dav	1200-1800 dav	----------	50 dav	0,1	----------
EU - Waste incineration	10 dav 30 hhav	10 dav 20 hhav	10 dav 60 hhav	1 dav 4 hhav	50 dav 200 hhav	200 dav (1) 400 dav (2) 400 hhav (1)	----------	50 dav 100 hhav 150 10mav	0,1 6-8hav	TOC of slag and bottom ashes <3% t_{com} > 800°C for 2 sec
EU -Cement kilns >2004 (2007)	100 (50) <3t 50 (30) > 3t dav (3)	20 (20) dav (4)	30 (10) < 3t 10 (10) > 3t dav (3)	5 (1) < 3t 1 (1) > 3t dav (3)	400 (400) dav (4)	800 (500) dav (5)	----------	(6)	0,1 (0,1) dav	

Table 5a2 – Explanations:

Cd = Cadmium and its compounds, Tl = Thallium and its compounds, Hg = Mercury and its compounds, Sb = Antimony and its compounds, As = Arsenic and its compounds, Pb = Lead and its compounds, Cr = Chromium and its compounds, Co = Cobalt and its compounds, Cu = Copper and its compounds, Mn = Manganese and its compounds, Ni = Nickel and its compounds, V = Vanadium and its compounds, Sn = Tin and its compounds, Zn = Zinc and its compounds, Se = Selenium and its compounds, Te = Tellurium and its compounds, Be= Beryllium

(average) values: dav = daily average value, hhav = half hourly average value, 3/8hav = three/eight hourly average value, min = minimum, max = maximum

Table 5a2 page 1	**Cd mg/m³**	**Tl mg/m³**	**Hg mg/m³**	**Sb mg/m³**	**As mg/m³**	**Pb mg/m³**	**Cr mg/m³**	**Co mg/m³**	**Cu mg/m³**	**Mn mg/m³**	**Ni mg/m³**	**V mg/m³**	**Sn mg/m³**	**others**
Austria	0,1 hhav (0,2 Cd+Tl+Be)	0,1 hhav (0,2 Cd+Tl+Be)	----------	----------	1,0 hhav as total of As+ Pb+Co+Ni	1,0 hhav as total of As+ Pb+Co+Ni	----------	1,0 hhav As+Pb+Co+ Ni	----------	----------	1,0 hhav as total of As+ Pb+Co+Ni	----------	----------	Be (0,1)
Belgium Walloon Region	0,1 - 0,2 dav	0,1 - 0,2 dav Tl+Hg	0,1 - 0,2 dav Tl+Hg	1,0 - 5,0 dav total of group*	1,0 - 5,0 dav total of group*	1,0 - 5,0 dav total of group*	1,0 - 5,0 dav total of group*	1,0 - 5,0 dav total of group*	1,0 - 5,0 dav total of group*	1,0 - 5,0 dav total of group*	1,0 - 5,0 dav total of group*	1,0 - 5,0 dav total of group*	1,0 - 5,0 dav total of group*	Be
France	0,05 hhav min, 8hav max total of Cd + Tl	0,05 hhav min, 8hav max total of Cd + Tl	0,05 hhav min, 8hav max	0,5 hhav min, 8hav max total of group*	0,5 hhav min, 8hav max total of group*	0,5 hhav min, 8hav max total of group*	0,5 hhav min, 8hav max total of group*	0,5 hhav min, 8hav max total of group*	0,5 hhav min, 8hav max total of group*	0,5 hhav min, 8hav max total of group*	0,5 hhav min, 8hav max total of group*	0,5 hhav min, 8hav max total of group*	0,5 hhav min, 8hav max total of group*	Se, Te, Zn
Germany	0,05 dav total Cd + Tl	0,05 dav total Cd + Tl	0,05 dav	0,5 dav total of group*	0,5 dav total of group*	0,5 dav total of group*	0,5 dav total of group*	0,5 dav total of group*	0,5 dav total of group*	0,5 dav total of group*	0,5 dav total of group*	0,5 dav total of group*	0,5 dav total of group*	----------
Greece	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	--------
Ireland	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	--------
Luxembourg	0,2 hhav	0,2 hhav	0,2 hhav	5 hhav	1 hhav	5 hhav	5 hhav	1 hhav	5 hhav		1 hhav	5 hhav		*
The Netherlands	0,05 hhav	0,05 hhav	0,05 hhav	1,0 dav total of group*	1,0 dav total of group*	1,0 dav total of group*	1,0 dav total of group*	1,0 dav total of group*	1,0 dav total of group*	1,0 dav total of group*	1,0 dav total of group*	1,0 dav total of group*	1,0 dav total of group*	Se, Te
Portugal	0,2 dav total Cd+Tl+Hg 0,1 dav Cd+Tl #	0,2 dav total Cd+Tl+Hg 0,1 dav Cd+Tl #	0,2 dav total Cd+Tl+Hg 0,1 dav #	2,0 dav 1 dav # total of group*	2,0 dav 1 dav # total of group*	2,0 dav 1 dav # total of group*	2,0 dav 1 dav # total of group*	2,0 dav 1 dav # total of group*	2,0 dav 1 dav # total of group*	2,0 dav 1 dav # total of group*	2,0 dav 1 dav # total of group*	2,0 dav 1 dav # total of group*	2,0 dav 1 dav # total of group*	---------
Spain, Catalonia	0,05 Cd+Tl	0,05 Cd+Tl	0,05	0,5 total of group *	0,5 total of group *	0,5 total of group *	0,5 total of group *	0,5 total of group *	0,5 total of group *	0,5 total of group *	0,5 total of group *	0,5 total of group *	0,5 total of group *	---------
Sweden	0,0002 3hav	0,006 3hav	0,001 3hav	0,004 3hav	0,01 3hav	0,04 3hav	0,1 3hav	0,004 3hav	0.06 3hav	0,16 3hav	0,065 3hav	0,01 3hav	0,08 3hav	----------
United Kingdom	0,1 dav total of Cd + Tl	0,1 dav total of Cd + Tl	0,1 dav	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	----------
UK - N. Ireland	0,1 dav total of Cd + Tl	0,1 dav total of Cd + Tl	0,1 dav	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	1,0 total of group*	----------
EU - Waste incineration	0,05 hh-8hav Cd + Tl	0,05 hh-8hav Cd + Tl	0,05 hh-8hav	0,5 hh-8hav total of group*	0,5 hh-8hav total of group*	0,5 hh-8hav total of group*	0,5 hh-8hav total of group*	0,5 hh-8hav total of group*	0,5 hh-8hav total of group*	0,5 hh-8hav total of group*	0,5 hh-8hav total of group*	0,5 hh-8hav total of group*	----------	
EU -Cement kilns >2004 (2007)	0,05 (0,05) dav Cd + Tl	0,05 (0,05) dav Cd + Tl	0,05 (0,05) dav	0,5 (0,5) dav total of group*	0,5 (0,5) dav total of group*	0,5 (0,5) dav total of group*	0,5 (0,5) dav total of group*	0,5 (0,5) dav total of group*	0,5 (0,5) dav total of group*	0,5 (0,5) dav total of group*	0,5 (0,5) dav total of group*	0,5 (0,5) dav total of group*	----------	

Comments:

Belgium, Walloon Region: group* = Sb + As + Pb + Cr + Co + Cu + Mn +Ni + V + Sn

France: (1) group* = mentioned heavy metals plus Se and Te (2) Other significant emission limit values: 5 mg/m3 6hav min and 8hav max for the total of Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + Sn + Se + Te + Zn

Germany: (1) For dust, SO2 and NOx: The emission limits shall be established in the letter of approval or in the supplementary directives and comprise of approved mass concentrations of air pollutants in the waste gas under the provision that (a) all daily means shall not exceed the established mass concentration, (b) 97 percent of all half-hourly means shall not exceed six fifth of the established mass concentration and (c) all half-hourly means shall not exceed the established mass concentrations more than twice. – (2) For the monitoring of emissions single measurings are to be conducted. The emission limit values are considered as being observed, if the result of each single measuring does not exceed the fixed emission limit value.

Ireland: To date EPA has only licensed conventional cement plants using conventional fuels.

Luxembourg: *) 5 mg/m3 hhav for Cd+Hg+Tl+As+Co+Ni+Se+Te+Sb+Cu+Pb+Cr+F+V. There are also limit values for the mass flow (kg/year) for dust, NOx, SO2 and TOC

Portugal: ELV´s are stipulated according to MWID; *total of group Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V+Sn; # these values are only a draft for permits

The Netherlands: group* = mentioned heavy metals plus Se and Te

Spain, Catalonia: * P95 of 24-hours integration of all 10-minutes-average; *total of group Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V+Sn

Sweden: The measurement period is not specified and there is no fixed reference oxygen content.

United Kingdom: These are guidance values. Some kilns have considerably higher SO2 releases because of high sulphur in raw material.

EU: Limit values as proposed in the working paper on the Incineration of Waste, March 1998 and updated Annex II.
(1)for existing plants with a capacity > 3t/h or new plants
(2) for existing plants with a capacity < 3 t/h
(3) C-total emission limit values (no mixing rule) for cement kilns with a capacity of < 3t waste/h and > 3t waste/h (hazardous and non-hazardous waste)
(4) C-proc emission limit values (mixing rule) shall be set by the competent authorities; exemptions may be authorised where TOC and SO2 do not result from the incineration of wastes
(5) pending reassessment
(6) ELV for CO shall be set by the authority

* total of Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V+Sn

b) Do <u>reference conditions</u> apply for limit values?

<u>Table 5b</u> page 1	**Oxygen**	**Temperature**	**Pressure**	**Dry**	**other**	**Comments**
Austria	10 %	0° C	1013 mbar	yes	substraction of effluent gas volume, that is not related to the process	----------
Belgium Walloon Region	11 %	273 K	101,3 kPa	yes	----------	without correction if O_2-content <11% in the exhaust gas except for D&F-measurements
France	11% most of time	0° C	1013 mbar	yes	----------	Measurements can also refer to other reference conditions. In this case the O_2-% must be fixed in the specific permit (it may be <6%)
Germany	11 %	----------	----------	----------	----------	----------
Greece	----------	----------	----------	----------	----------	----------
Ireland	10 %	273 K	101,3 kPa	no (non-combustion gases)	dry gas for combustion gases	----------
Luxembourg	10 %	0 ° C	1013 mbar	yes		
The Netherlands	11 %	273 K	101,3 kPa	yes	----------	----------
Portugal	10 %	----------	----------	----------	----------	----------
Spain, Catalonia	11 %	273°K	101 kPa	yes	----------	----------
Sweden	----------	273 K	101,3 kP	yes	CO max 290 (400) ppm	----------
United Kingdom	11 %	273 K	101,3 kPa	yes	----------	This is in order to comply with the HWID. A lower oxygen content would probably be more applicable to reflect more energy efficient combustion.
UK - N. Ireland	11 %	273 K	101,3 kPa	yes	----------	----------
EU - Waste Incineration	11 %	273 K	101,3 kPa	dry		3 % oxygen in case of incineration of waste oil

c) Is the mixing rule used?

Table 5c page 1	yes/no	Comments
Austria	no	----------
Belgium Walloon Region	yes	A proportional mixing rule function of the percentage of wastes burned is used. The ELV taken in account in this case for the part of emissions resulting of the incineration of wastes are these of the 94/67/EC directive.
France	yes	Some limit values have been defined on the basis of the mixing rule with an hypothesis of 40 % of incinerated waste. Others (metals, dust) haven't been defined so..
Germany	yes	Rules in the 17th ordinance of Federal Immission Protection Act (BImSchG)
Greece	no	----------
Luxembourg	no	
Ireland	not to date	To date EPA has only licensed conventional cement plants using conventional fuels.
The Netherlands	no	The input is within limits not the dominant criterion, but the output, the emissions.
Portugal	yes	Not more than 25 percent alternative fuels can be used (Annex 2 of Directive 94/67).
Spain, Catalonia	yes	proportion of input (calorific value) is the proportion of ELV in the worst case
Sweden	no	----------
United Kingdom	yes	for hazardous waste; where municipal waste is used MWID is applied
UK - N. Ireland	yes	Heat obtained from burning hazardous waste is restricted to 25 % maximum. Overall limits are proportioned using incineration and cement manufacture limits.
EU - Waste inc.	yes	on the basis of exhaust gas volume, for cement kilns mixing rule is only foreseen for SO2 and TOC

d) Are air emission limits fixed in

Table 5d page 1	ordinances or in the single licence	Comments
Austria	ordinances and in the single licence	Both: In addition to the general limitations as in the ordinance e. g. PCDD/F is limited in the single licence.
Belgium, Wall.	single licence	----------
France	single licence	They are fixed in the prefectoral permit.
Germany	in ordinances and in the single licence	----------
Greece	----------	For all emission limit values the directive 94/67/EC is applying.
Luxembourg	single licence	
Ireland	individual licence	Fixed in integrated pollution control licences.
The Netherlands	single licence	Emission as a year load of SO2 and NOx is specified in the permit (see also question 5).
Portugal	----------	----------
Spain, Catalonia	single licence	
Sweden	single licence	ELVs could be supplements or in some cases replaced by comparable technical measures.
United Kingdom	single licence	----------
UK- N. Ireland	single licence	----------
EU - Waste Incineration	single permit	

6. Best available technology (BAT)

Table 6 page 1	Does a standard for BAT exist in your country?	If so, does it serve as the basis for the permit for cement plants using alternative fuels?	If so, are these standards compulsory or guidelines?	Comments
Austria	yes	yes	yes	Per definition the ordinance fixes BAT-level.
Belgium, Wall.	----------	----------	----------	----------
France	no	----------	----------	----------
Germany	yes		compulsory and guidelines	TA-Luft (Technical Instruction on Air)
Greece	yes	----------	----------	The existing BATNEEC for cement plants are applying in all cement plants.
Ireland	yes	yes	guidelines	BATNEEC limits apply strictly for new plants, not strictly for existing plants.
Luxembourg	yes		guidelines	guideline for the authority reflects BAT from 1994
The Netherlands	yes	yes	yes	This Dutch BAT-Document is a contribution to the IPPC-BAT-Document and is already presented to IPPC-Seville.
Portugal	yes	yes	compulsory	still in discussion (BAT/ DG XI/ ...)
Spain, Catalonia	no	----------	----------	----------
Sweden	no	----------	----------	The Environmental Protection Act is based on a case-by-case integrated pollution control system. The law provides great flexibility in order to obtain the best overall solution from environmental point of view. Requirements are settled with regard to what is technically achievable, economically feasible and environmentally justified in the selected case (BAT determined in the specific case).
United Kingdom	yes	yes	guidelines	Process guidance notes are produced and revised every four years.
UK - N. Ireland	yes	yes	guidelines	Use guidance notes produced by Environment Agency (England and Wales) - cement manufacture and hazardous waste incineration. This guidance reflects European directives as applicable.
EU- Waste Incineration	yes	yes	compulsory	as defined in Art. 2(11) of IPPC

7. Authorisation or licence

Table 7a page 1	The licence is issued in ...	The licence is limited to a certain period	The licence is reviewed periodically	The licence can be reviewed by the authority at any time	Comments
Austria	writing	might be -> see comments	no	no	The licence might be limited for e. g. 1 year to do enforced monitoring and becomes an unlimited one, if no irregularities occur within this testing period; the licence might be limited also for trial (e.g. 2 years)
Belgium, Wall.	writing	20 years	----------	yes	----------
France	writing	no	no	yes	----------
Germany	writing	no		yes	----------
Greece	writing	yes	yes	yes	----------
Luxembourg	writing	no	no	yes	----------
Ireland	writing	typically 5 years	typically 5 years	yes	----------
The Netherlands	writing	10 years	no	yes	----------
Portugal	writing	yes	yes	yes	----------
Spain, Catalonia	writing	max. 5 years	when expired	in exceptional cases	for using alternative fuels
Sweden	writing	no	yes	yes	It is always possible to review the conditions after ten years or earlier in the event for example of unforeseen disturbances, new technology or as a consequence of EC-legislation.
United Kingdom	writing	no	4 years (statutory)	yes	----------
UK - N. Ireland	writing	no	4 years - statutory requirement	yes	----------
EU- Waste Inc.	writing	no	no		----------

Can the licence contain <u>additional mandatory conditions</u>?

<u>Table 7b</u> page 1	**Concerning emission limit values**	**Concerning quality checks of the alternative fuels used**	**Concerning monitoring**	**Concerning production data**	**Concerning heat recovery**	**Comments**
Austria	yes	yes	yes	yes	no	Further concerning => Ambient air monitoring (dust etc.) for a fixed period => Amount of waste/alternative fuel per year
Belgium, Wall.	yes	yes	yes	yes	yes	----------
France	yes	yes	yes	yes	yes	The specific rules may be more strict than the national rules.
Germany	yes	yes	yes	yes	----------	----------
Greece	yes	yes	yes	yes	yes	Further concerning quantity of the alternative fuels used.
Ireland	yes	yes	yes	yes	yes	----------
Luxembourg	yes	yes	yes	yes	yes	----------
The Netherlands	yes	yes	yes	yes	yes	----------
Portugal	yes	yes	yes	yes	yes	----------
Spain, Catalonia	yes	yes	yes	yes	no	----------
Sweden	yes	yes	yes	yes	yes	----------
United Kingdom	yes	yes	yes	yes	----------	Further concerning the calibration of instruments, storage and handling, reporting requirements
UK - N. Ireland	yes	yes	yes	yes	current not mandatory	Further concerning storage and handling
EU - Waste inc.	yes	yes	yes	yes	yes, afap	

8. Public involvement

By what means is it possible for the public to become involved in the permit procedure?

Table 8 page 1	Orally	In writing	In public hearings	Comments
Austria	voluntary	voluntary	voluntary (compulsory)	Hearings are compulsory during an environmental impact assessment.
Belgium, Wall.	voluntary	voluntary	voluntary	A 30 days public inquiry is included, which is announced by posters and publication in 2 newspapers. During this period each person may emit his opposition against the project. If the number of opponents >25, a concert meeting is organised by the authority.
France	voluntary	voluntary	compulsory and voluntary	Each application is subject to an examination process including a public hearing.
Germany	----------	yes	yes	If an environmental impact is possible => advertisement of the application
Greece	compulsory	compulsory	----------	By the regional prefecture.
Ireland	voluntary	compulsory	compulsory	The Irish licensing system attempts to be fully transparent. Public participation is fully provided for in the legislation.
Luxembourg				During the public procedure the application can be consulted and oral and written remarks are collected
The Netherlands	voluntary	voluntary	voluntary	----------
Portugal	voluntary	voluntary	compulsory	----------
Spain, Catalonia	no	compulsory	no	there is a period of public information of the project by law
Sweden	compulsory	compulsory	compulsory	----------
United Kingdom	voluntary	compulsory	voluntary	The Environment Agency has a policy of undertaking the widest possible public consultation. Operators are required by law to advertise locally about any application to burn waste fuels.
UK - N. Ireland	voluntary	voluntary	voluntary	Applications are advertised in local newspapers.
EU - Waste incineration				in accordance with Art. 15 of IPPC

9. Monitoring - Air

a) Which form of <u>monitoring of the emissions</u> of a cement plant is usually applied for the given parameters?

<u>Tables 9a1-4 – Explanations:</u> see tables 5

Diox = Dioxins, °C = Temperature in Celsius degree, CO_2 = Carbon dioxide, PAH=PAC = polycyclic aromatic (hydro)carbons, BTXE = benzene, toluene, xylene, ethylbenzene, PM 10 = particle matters <10µm

Discontinuous self monitoring

<u>Table 9a1</u>	**Dust**	**TOC**	**HCl**	**HF**	**SO_2**	**NO_2**	**NH_3**	**Cd**	**Tl**	**Hg**	**Sb**	**As**	**Pb**	**Cr**	**Co**	**Cu**	**Mn**	**Ni**	**V**	**Sn**	**Diox**	**°C**	**CO**	**CO_2**		
Austria																									PAH, Be	Benzene
Belgium, Wall.																										
France																										.
Germany																									O_2	
Greece																										
Ireland																										
Luxembourg																										
The Netherlands																									PAC	Se, Te
Portugal																										
Spain, Catalonia																										
Sweden																										
United Kingdom																										
UK - N. Ireland																										PM 10
EU - Waste inc.																										

Discontinuous monitoring by the authority

<u>Table 9a2</u>	**Dust**	**TOC**	**HCl**	**HF**	**SO_2**	**NO_2**	**NH_3**	**Cd**	**Tl**	**Hg**	**Sb**	**As**	**Pb**	**Cr**	**Co**	**Cu**	**Mn**	**Ni**	**V**	**Sn**	**Diox**	**°C**	**CO**	**CO_2**		
Austria																									PAH, Be	Benzene
Belgium, Wall.																										
France																										.
Germany																									PAH	BTXE
Greece																										
Ireland																										
Luxembourg																										
The Netherlands																									PAC	Se, Te
Portugal																										
Spain, Catalonia																										
Sweden																										
United Kingdom																										
UK - N. Ireland																										
EU - Waste inc.																										

Continuous self monitoring

Table 9a3	Dust	TOC	HCl	HF	SO_2	NO_2	NH_3	Cd	Tl	Hg	Sb	As	Pb	Cr	Co	Cu	Mn	Ni	V	Sn	Diox	°C	CO	CO_2		
Austria	■				■	■																■	■			
Belgium, Wall.	■	■	■	■	■	■																■	■	■		
France	■	■	■	■	■																	■	■		O_2	.
Germany	■	■			■	■																■	■	■	O_2	
Greece	■				■	■																■	■			
Ireland	■				■	■																				
Luxembourg	■					■																■				
The Netherlands	■				■	■																■				
Portugal	■					■																	■			
Spain, Catalonia																						■	■			
Sweden	■				■	■																■	■			
United Kingdom	■				■	■																■	■		O_2	
UK - N. Ireland	■	■	■		■	■																■	■			
EU - Waste inc.	■	■	■	■	■	■																■	■		O_2	t,V,p

Continuous monitoring by the authority

Table 9a4	Dust	TOC	HCl	HF	SO_2	NO_2	NH_3	Cd	Tl	Hg	Sb	As	Pb	Cr	Co	Cu	Mn	Ni	V	Sn	Diox	°C	CO	CO_2		
Austria																										
Belgium, Wall.																										
France																										.
Germany	■	■		■	■																		■		O_2	
Greece																										
Ireland																										
Luxembourg																										
The Netherlands																										
Portugal																										
Spain, Catalonia																										
Sweden																										
United Kingdom	■	■	■		■	■																■	■	■		
UK - N. Ireland	■	■	■		■	■																■	■		O_2	
EU - Waste inc.	■	■	■	■	■	■																■	■		O_2	t,V,p

Comments:

Belgium, Walloon Region: All the substances of table 5a1 and 5a2 plus reference parameters may be measured. The permit granted by the authority contains obligations concerning the monitoring of the emissions. This authority is not able to realise himself the sampling and the analysis of the exhaust gas. These operations are executed by specialised laboratories, which are recognised by the Minister of environment. The compliance of the results with the values included in the permit is made either by the burgomaster or by the environmental police.

France: Inspection methodology: Pre-programmed visits and random visits are used. The operator is to set up a surveillance programme for his emissions. The measurements are taken under the responsibility of the operator in accordance with his permit order. At least twice a year these measurements are to be made by an organisation accredited by the ministry in charge with environment.

Germany: BTXE => Benzol, Toluol, Xylol, Ethylbenzol; discontinuous monitoring of the emission : Phenole, Chlorbenzole, Chlorphenole, Chlornaphtaline

Portugal: certification (collection/laboratories)
UK - N. Ireland: Agreed frequency of discontinuous monitoring can be varied by IPRI depending on complaints, local difficulties etc.

EU: no stipulation in the working paper (March 98), if monitoring by operator or authority; at least two measurements per year of heavy metals and dioxins and one measurement every three months for the first 12 months of operation; continuos measurement for HF may be replaced by periodical, if treatment stages for HCl are used which make sure that the ELV for HCl is not being exceeded; for HCl, HF TOC and SO2 periodic instead of continuous measurement may be authorised by the competent authority in plants < 3t/h, if the operator can prove that the av of those pollutants can under no circumstances be higher than 75% of the ELV´s.

b) Which form of monitoring of the ambient environment around a cement plant is usually applied for the given parameters?

Austria: (1) Discontinuous self monitoring for Dust, Cd, Tl, As, Pb, Ni, MgO and CaO (2) Discontinuous monitoring by the authority with Bergerhoff-method for Dust, Cd, Tl, As, Pb, Cr, Cu, Mn, Ni, MgO and CaO. Bio indicators are used => Weidelgras for Hg, Cd, Te, Ni, Zn, (H)F and Grünkohl for PAH and Dioxins (3) Continuous monitoring by the authority for Dust, SO_2 and NO_2. (4) Ambient environment monitoring is done by the authority mainly. Only during an enforced monitoring period (e. g. during the first year of co-incineration) the applicants install monitoring systems themselves.

Belgium, Walloon Region: Discontinuous monitoring by the authority for all given parameters except TOC and NH_3

France: general air quality monitoring has been extended to all urban areas with a population of over 250,000 as of 1.1.97, to areas of over 100,000 as of 1.1.98 and to the entire country as of 1.1.2000.

Greece: Discontinuous self monitoring for Dust and NO_2.

Luxembourg: Dust monitored with Bergerhoff-method

Spain, Catalonia: Dust, with conventional fuels a cement plant is forced only to fulfil a limit on dust and opacity according to Spanish 833/1975 decree.

United Kingdom: (1) Discontinuous self monitoring for metals and dioxins in soils (2) Continuous monitoring by the authority for Dust, SO_2 and NO_2 (3) The amount of testing required will depend on local topography and circumstances.

UK - N. Ireland: Soil samples for metals and dioxins in form of discontinuous self monitoring. Dust in form of continuous self monitoring.

EU - Waste incineration: no regulations or requirements in the working paper, March 1998.

10. Appeal process

Table 10 page 1	a) Who is allowed to appeal against the granting of a permit or a licence?	b) Who decides about an appeal?	Comments
Austria	-> applicant, neighbours -> in EIA procedures => also the environmental ombudsman, communities and citizens' group	-> Authority that granted the permit -> Higher administrative instance	----------
Belgium Walloon Region	-> applicant, community, neighbours, environmental body, NGOs, in principle each third party	-> Higher administrative instance => Minister of Environment	----------
France	-> applicant, community, neighbours, environmental body, NGOs -> in principle everybody	-> Higher administrative instance => administrative tribunal -> court of justice	----------
Germany	-> every person	-> Authority that granted the permit => Bezirksregierung -> Administrative court => Verwaltungsgericht	Administrative courts: Under German law these courts are responsible for all conflicts relating to the public law which are not of a constitutional nature, especially those challenging administrative acts.
Greece	-> applicant, community, neighbours, environmental body	-> Authority that granted the permit => Ministries for Environment and Development -> Court of justice => Higher Council of Justice	----------
Ireland	-> applicant, community, neighbours, environmental body, NGOs	-> Authority that granted the permit => Environmental Protection Agency -> Court of justice => In the case of judicial review only	----------
Luxembourg	-> applicant, community, neighbours, NGOs	-> Authority that granted the permit => administrative court „Tribunal Administratif"	----------
The Netherlands	-> applicant, communities, neighbours, environmental body	-> Authority that granted the permit => Province -> Court of justice => Raad van State	The comments on the published draft licence are dealt with by the authority that granted the licence. The outcome leads to a published final licence. Appeals to this final licence are dealt with by the court of justice.
Portugal	-> communities, neighbours, environmental body, NGOs	-> Authority that granted the permit => Industry Ministry -> Court of justice / Administrative Court	----------
Spain, Catalonia	-> applicant, community, neighbours, environmental body, NGOs	-> Authority that granted the permit => Environmental Ministry in case of waste management -> Catalonia Justice High Court	----------
Sweden	-> applicant, community, neighbours, Local employee organisations, Swedish EPA	-> Higher administrative instance => Government	----------
United Kingdom	-> applicant	-> Higher administrative instance => Government Inspectorate	The Environment Agency my be judicially reviewed by the Ombudsman, but there is no appeal.
UK - N. Ireland	-> applicant	-> Higher administrative instance => Department of Environment	Department of Environment on receipt of appeal has 3 options: (1) It can determine it itself. (2) Refer it to a third party with appropriate expertise. (3) Refer it to Planning Appeals Commission (PAC). In case of (2) and (3) the Department can request the appeal either to be determined by the third party (PAC) or for them to make recommendations to the Department who will then make final decision.

11. Legal consequences for non-compliance

Table 11 page 1	a) Which legal body pursues non- compliance?	b) Range of penalties for non-compliance?
Austria	-> Administrative body => Authority that granted the permit -> Court of justice for criminal affairs -> Court of justice for civil affairs	up to 36.000 ECU administrative fine up to 3 years in Court of Justice
Belgium, Wall.	local authority, the Environment Police, Court of Justice	10.000 to 100.000 ECU an/or a term of imprisonment of 15 days to 6 month
France	-> The local authority => the prefect -> Court of justice for criminal affairs => the correctional or police tribunal	-> 3.400 to 17.000 ECU -> Any person shall be liable to a term of imprisonment of 2 months to 2 years
Germany	-> Administrative body => Staatliches Umweltamt -> Court of justice for civil affairs => Amtsgericht/Landgericht	----------
Greece	-> Administrative body => Ministries for Environment and Development -> Court of justice for criminal affairs -> Court of justice for civil affairs	There are no limits of penalties for non-compliance
Ireland	-> Administrative body => EPA through the lower or higher courts	up to 1,3 million ECU
Luxembourg	-> Administrative body -> Court of justice for criminal affairs -> Court of justice for civil affairs	60 - 12.3.000 ECU 8 days to 6 months imprisonment
The Netherlands	-> Administrative body => Province -> Court of justice for criminal affairs => Prosecutor	-> 250 - 500.000 ECU -> Withdrawing of licence (closing of plant) or part of licence
Portugal	-> Administrative body => Ministries for Industry and Environment -> Court of justice for criminal affairs -> Court of justice for civil affairs / Administrative Court	-> 4500 ECU -> The burning of secondary raw materials will be suspended.
Spain, Catalonia	-> Authority that granted the permit => Environmental Public Prosecutor, Criminal Court -> Court of justice, first instance court	administrative up to 1,3 MECU in court up to imprisonment
Sweden	-> Administrative body => Supervisory authority -> Court of justice for criminal affairs -> Swedish EPA	-> Fine proportional to one's daily income or a maximum of two year imprisonment -> An Environment Protection Charge corresponding to any profit derived from the infringement
United Kingdom	-> Administrative body => Environment Agency	-> up to ECU 30.000 in magistrates court -> in Court - unlimited fines and imprisonment
UK - N. Ireland	-> Administrative body => IPRI	-> 3 months imprisonment and/or maximum fine of ECU 30.000 in magistrates court -> Chief inspector can also bring proceedings in the High Court - Penalty: unspecified fine and/or 2 years imprisonment -> Inspector can issue enforcement and prohibition notices under the IPC order

12. Final questions

Table 12 page 1	Approx. number of cement plants	Approx. number of cement plants using alternative fuels	Approx. number of cement plants practising heat recovery	Average duration of licensing procedure for such plants	Comments
Austria	10	8	0	12 weeks	Might be up to one year.
Belgium Walloon Region	4	4	4	52 weeks	----------
France	34	22	----------	1 year, but it is variable	
Finland	----------	2			
Germany	50	25 - 30	----------	15 - 30 weeks	Without public involvement - 15 weeks. With public involvement - 30 weeks.
Greece	8	3	3	10 weeks	----------
Ireland	5	0 (to date)	0	16 weeks	----------
Luxembourg	1	1	0	28 weeks	
The Netherlands	1	1	1	24 weeks	70% heat recovery to heat and dry raw material and to warm-up secondary burner-air
Portugal	6	1	0	variable 120 days EIA 90 days pre-authorisation	----------
Spain, Catalonia	6	0	0		there is permit to use certain waste as raw material (paper factory sludge, slags, foundry sand) but not as alternative fuels
Sweden	3	3	0	24 weeks	----------
United Kingdom	20	6 + 4	----------	26 weeks	No continuous burning of substitute waste fuel is permitted without successful trials.
UK - N. Ireland	2	none at present	----------	26 weeks	Trials have been completed. Current proposal to use lorry tyres as alternative fuels.

Final remarks

Please give your comments, corrections or amendments directly to the organising committee.

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