Best Available Techniques to reduce emissions from refineries

*CONCAWE will play a full part in the development of the
BAT reference document for refineries.*

Over the past few years, European governments have progressively sought the application of Best Available Techniques (BAT) for the control of environmental emissions from a range of industrial sectors, including the oil industry. This culminated in the Integrated Pollution Prevention & Control (IPPC) Directive[1] which was adopted in 1996. The Directive calls for a high level of protection for the environment as a whole and this protection should be achieved through application of Best Available Techniques (BAT) taking into consideration economic viability and local environmental factors.

The Directive does not itself specify Emission Limit Values (ELV) to be achieved or which techniques should be used. Instead, it provides a framework for local regulators to control industries in their own areas. To assist them, the Directive calls for the Commission to organize an exchange of information on BAT between Member States. The main vehicle for this information exchange are the so-called BAT reference documents (BREFs); these will be written for a number of selected industries that are seen to be major contributors to the types of pollution mentioned in the IPPC annexes (see table on the left). The BREFs are to be prepared for the Commission by the European IPPC Bureau established in Seville.

EIPPCB BREF Work Programme	
Start year	*Industries[1]*
1997	Primary/secondary steel; cement and lime; paper/pulp; **cooling systems**
1998	Ferrous metal processing; non-ferrous metal production and processing; glass; chloralkali; textiles; tanneries; **monitoring of emissions**
1999	**Refineries;** smitheries and foundries; **large volume organic chemicals; large volume gaseous and liquid inorganic chemicals;** intensive livestock farming; **emissions from storage (of dangerous substances and bulk materials); wastewater and waste gas treatment/management systems in the chemical industry; cross-media and economic aspects**
2000 (draft)	Large volume solid inorganics; hazardous waste disposal/recovery; slaughterhouses/animal carcasses; food and milk
2001 (draft)	Large combustion plants; coal liquefaction; surface treatment of metals; asbestos; ceramics; polymers; surface treatment using solvents
2002 (draft)	Speciality inorganics; organic fine chemicals; municipal waste incineration; non-hazardous waste disposal; landfills

[1] *Bold type denotes BREFs that may affect the oil industry*
[2] *Italic type denotes BREFs which are 'horizontal', i.e. they are general to most industries*

It is clear that the BREFS will assume great significance, since it is intended that legislators and control authorities will use them as a guide for establishing future ELVs for selected emitting sources. The Directive also allows for the setting of EU-wide ELVs where the need is identified but no such proposals have yet been made. Certainly, the BATs identified will provide a benchmark for determining the obligations of industrial operators in respect of pollution prevention and control.

Although CONCAWE's viewpoint on the concept of BAT may differ from those who favour a strict interpretation, it does intend to be fully involved in the preparation of the documents relevant to the oil industry, most importantly, in the Refinery Reference Document scheduled to start in 1999

[1] *Reference Council Directive 96/61/EC of 24 September 1996*

(see table on the right). This is because CONCAWE, as the technical organization of the oil industry, wishes to make a positive and informed contribution to the whole exercise, based on actual data on facilities installed in refineries, their capital and operating costs, and delivered performance capability. For that purpose, CONCAWE established two Special Task Forces to study BAT pollution control as applied for all media (water, waste, soil and groundwater, and air quality). The report will be submitted as background information and considers a wide range of emissions control techniques for refinery operations, the cost of installing and operating them, and the performance they have been demonstrated to deliver. In other words, actual practical data and costs of installed equipment are presented, rather than the cost/performance claimed by the designers/vendors of the equipment.

The 1999 BREF work	
Industry	*Leading industry organization*
Oil refineries	CONCAWE
Emissions from storage (of dangerous substances and bulk materials)	CONCAWE
Large volume organic chemicals	CEFIC
Large volume liquid and gaseous inorganic chemicals	CEFIC
Wastewater and waste gas treatment/ management systems in the chemical industry	CEFIC

The information was gathered by means of questionnaires sent to all CONCAWE member companies' European refineries. The data are presented as a series of technical descriptions and tables of cost and performance. The report describes the techniques used to minimize emissions/discharges to air and surface water, soil and groundwater, and the production of waste. In addition, the implications of pollution controls on energy use are addressed.

Several important principles concerning BAT are reviewed in the report to ensure that the available techniques described are properly assessed in future considerations of their applicability as BAT. These are as follows:

● There is no such thing as a 'universal' BAT for oil refineries. They differ in size, complexity, the types of processes they operate, and the crudes they process. Climatic/environmental conditions (e.g. wind/geology) and the location of the refinery (e.g. inland or coastal, etc.) can influence the impact of emissions on the environment. BAT therefore includes a site-specific content to account for these differences.

● It is *the impact* that emitted pollutants have on the environment into which they are discharged that should dictate the level of control required as BAT, and *not* the simple availability of existing techniques/technology to control them to ever lower limits. This risk-based approach to BAT will help ensure that society's limited resources are directed toward the most cost-effective controls that result in the largest possible environmental benefit.

● BAT costs are frequently quoted based only on the hardware. This approach significantly underestimates the real cost of BAT applications, which may be up to four times greater when taking into account design, engineering, infrastructure preparation and installation costs.

● The cost of 'BAT' is significantly impacted by what level of control already exists at a refinery. While application of a technology offering 99 per cent emissions control may be cost-effectively applied to an otherwise uncontrolled site, the same technology installed at a site which has previously invested in controls that are 97 per cent effective could provide a very poor emission reduction return for the investment.

● Cross media impacts can often result from the application of controls. These should be considered in the risk assessment mentioned previously when assessing the wisdom of applying a BAT at a given location.

● BAT should be used to set appropriate emission levels for a given situation/location as a result of establishing the level that can be economically met. However, the facility should be allowed to achieve the specified level using the techniques of their choice.