



## **Environmental Challenges and Opportunities of the Evolving North American Electricity Market**

Secretariat Report to Council under Article 13 of the  
North American Agreement on Environmental Cooperation

**6**

### **Background Paper**

## **European Electricity Generating Facilities: An Overview of European Regulatory Requirements and Standardization Efforts**

**Prepared by:** Lisa Nichols

**Date:** June 2002

This background paper was prepared for the CEC Secretariat in support of the “Electricity and Environment” initiative undertaken pursuant to Article 13 of the North American Agreement on Environmental Cooperation. These background materials are intended to stimulate discussion and elicit comments from the public, as well as the Electricity and Environment Advisory Board, in addition to providing information for the 29–30 November 2001 Symposium on the “Environmental Challenges and Opportunities of the Evolving North American Electricity Market.” The opinions, views or other information contained herein do not necessarily reflect the views of the CEC, Canada, Mexico or the United States.

Commission for Environmental Cooperation of North America  
393, rue Saint-Jacques Ouest, Bureau 200  
Montréal (Québec) Canada H2Y 1N9  
Tel: (514) 350-4300; Fax: (514) 350-4314  
E-mail: [info@ccemtl.org](mailto:info@ccemtl.org)  
<http://www.cec.org>

© Commission for Environmental Cooperation of North America, 2002

## TABLE OF CONTENTS

<b>Introduction</b>	1
<b>The European Union</b>	2
EU legislation	4
DG Environment	6
DG Energy and Transport	7
European Environment Agency	8
<b>Regulatory Regime—The Internal Energy Market</b>	9
Internal market Directive—Electricity	10
Internal market Directive—Natural Gas	12
<b>Regulatory Regime—Generation and Environmental Regulations</b>	13
Promotion of electricity from renewable energy sources	13
Promotion of combined heat and power	13
Facility siting	13
Environmental impact assessment Directive	14
Strategic environmental assessment Directive	15
Large combustion plant (LCP) / National emissions ceilings (NEC) Directive	17
Integrated pollution prevention and control (IPPC) Directive	19
Sulphur content in liquid fuels Directive	22
Greenhouse gas emissions trading—proposed Directive	23
<b>Environmental Management Systems</b>	25
<b>Standardization</b>	26
Key points	30
<b>European Organizations Involved in Electricity Issues</b>	32
Eurelectric	32
Eurogas	32
International Council on Large Electric Systems (CIGRE)	33
Concawe	33
International Energy Agency (IEA)	33
Centre for European Policy Studies (CEPS)	34
<b>European Commission Programs</b>	35
Clean Air for Europe (CAFE)	35
ETAP	35
Synergy	36
Altener II	36
Carnot	37
ExternE	37
Sure	38

<b>Trends</b>	39
Compliance	39
Electricity generation	40
Emissions trading	41
<b>References</b>	42
<b>Acronyms and definitions</b>	44

## **INTRODUCTION**

The objective of this study is to present European siting and emission requirements for coal-fired and natural gas generating facilities, and provide an overview of the European standardization process. A summary of the functioning of the European Union is presented. Relevant organizations are identified, current trends are presented.

This is a complex area, there is much happening tangentially that affects the power generating facilities. The electricity and gas markets are opened, there is pressure on the generators and governments to provide a steady energy supply to consumers, and pressure to close nuclear power facilities.

## THE EUROPEAN UNION

From an original European Community membership of 6 countries, the European Union now includes 15 member states<sup>1</sup> and 11 official languages:

Austria	Germany	Netherlands
Belgium	Greece	Portugal
Denmark	Ireland	Spain
Finland	Italy	Sweden
France	Luxembourg	United Kingdom

There are five main European Union institutions: the Commission, the Council of Ministers, the European Council, the European Parliament and the Court of Justice.

**The European Commission (EC, or the Commission)** consists of 20 members serving 5-year terms, and over 20,000 staff, based in Brussels. The larger countries have two Commissioners (France, Germany, Italy, Spain, UK) and each of the remaining ten has one commissioner. The Commission is divided into 25 separate policy areas, known as directorates-general (DGs). For example, four of the DGs are: Environment, Energy and Transport, Research, and Competition. Each DG is headed by a director-general who reports to a Commissioner. The Commission is the “guardian of the treaties,” ensuring that EU legislation is fully implemented in all the member states; it also administers EU policy and manages the trade relations. The Commission has the right of initiative: the Council and the European Parliament need a proposal from the Commission before they can pass legislation.

**The Council of the European Union (the Council)** consists of one minister from each of the 15 member states, who is empowered to commit his government. Which minister attends each Council meeting varies according to the subject being discussed—for example, Ministers for Foreign Affairs attend the configuration known as the General Affairs Council to deal with external relations and general policy. The Council meets in Brussels and Luxembourg. The frequency of meetings depends on the subject. The presidency rotates every six months (the last half of 2001 was under Belgian presidency, followed by Spanish presidency in the first half of 2002). In the Council, the member states legislate for the Union, set political objectives, coordinate national policies and resolve differences between themselves and other institutions—their principal responsibility is to take policy and legislative decisions. Most matters, including environmental issues, are decided by qualified majority voting, but some by unanimity. Qualified majority voting means that at least 62 of 87 potential votes (71 percent) must be in favor for the proposal to be accepted.<sup>2</sup>

**The Court of Justice**, the supreme court of the EU, consists of 15 judges (one from each member state) and 9 advocates-general and is based in Luxembourg. It ensures that treaties are respected and applied. It is responsible for directly applying the law in certain types of cases, and it has general responsibility for interpreting the provisions of EU law and ensuring the consistent and uniform application of the law. Two types of cases may be brought before the Court of Justice:

---

<sup>1</sup> Out of these countries, all have opted to participate in economic and monetary union (i.e., the introduction of the Euro as the common currency) except the United Kingdom and Sweden. Denmark, although rejecting the Euro, has pegged its currency to it. The Euro has been the official currency since 1 January 1999, and Euro notes and coins will appear in circulation 1 January 2002.

<sup>2</sup> Votes by country, based on population, are broken down as follows:

Germany, France, Italy, UK	10 votes
Spain	8 votes
Belgium, Greece, Netherlands, Portugal	5 votes
Austria, Sweden	4 votes
Ireland, Denmark, Finland	3 votes
Luxembourg	2 votes

- Direct action—the Court is asked to give a judgment in a dispute between two or more parties. Cases are usually brought by the Commission, but may be brought by other EC institutions, or by a member state. There are several types of direct actions:
  - allegation that member states have failed to fulfill an obligation,
  - review of legality of acts adopted jointly by the Parliament and Council, acts of the Council, and others,
  - allegation that the Parliament, the Council or the Commission has failed to act on a matter on which it was obliged to act, and
  - decision on whether the Community is liable for damage caused by its institutions in the performance of duties.
- Preliminary rulings—the Court is asked to give an interpretation on points of EU law; these are requested by courts in the member states when they need a decision on a question of Community law in order to be able to give a judgment. Once having received a decision, the national court is obliged to use the judgment in deciding the case before it.

Cases brought by individuals and companies against decisions of the EC institutions are handled by the Court of First Instance.

The claim of legal supremacy in the interpretation, application and adjudication of the EU laws is a central element of the supranational character of the EU. The member states are required to surrender some of their sovereignty since they must submit to a legal system over which they only have partial control.

**The European Parliament (the Parliament)** consists of 626 members directly elected every 5 years, based in Luxembourg, with meetings in Strasbourg and Brussels. Its primary objectives are to pass good laws and control the executive power, and it adopts the EU budget each year. There are four possible legislative procedures by which the Parliament may exercise its legislative powers, depending on the nature of the proposal received:

- Consultation procedure (one reading)—Parliament’s opinion must be obtained before a legislative proposal from the Commission is adopted by the Council. The opinion is intended to influence the Council’s decision.
- Cooperation procedure (two readings)—If the opinion given by Parliament at its first reading is insufficiently taken into account in the Council’s common opinion, Parliament may reject the proposal at the second reading. Then, the Council can only overturn Parliament’s rejection by a unanimous decision.
- Co-decision procedure (three readings)—Parliament shares decision-making power equally with the Council. If Parliament decides to reject the proposal, it cannot be adopted by the Council. To prevent this situation from happening, a conciliation committee (consisting of members of Parliament, the Council and the Commission) is convened to seek a compromise before the third reading. If agreement is still not reached, Parliament can reject the proposal definitively.
- Assent procedure—Parliament’s assent is needed for decisions on accession of new member states, association agreements with third countries, international agreements, and other broad areas.

**The European Council** is comprised of the heads of state or government and the President of the Commission, meeting at least twice a year. It decides broad policy issues, sets priorities, gives political direction, and helps to resolve contentious issues.

The *acquis communautaire* comprises the entire body of legislation of the European Communities which has accumulated, and been revised, over the last 40 years. It includes:

- the founding Treaty of Rome as revised by the Maastricht and Amsterdam Treaties,
- the Regulations and Directives passed by the Council of Ministers, most of which concern the single market, and
- the judgments of the European Court of Justice.

Countries wishing to join the European Union must adopt and implement the entire *acquis* upon accession. The European Council has ruled out any partial adoption of the *acquis*, as it is felt that this would raise more problems than it would solve, and would result in a dilution of the *acquis* itself.

In addition to transposing the body of EU legislation into their own national law, candidate countries must ensure that it is properly implemented and enforced. Administrative structures may need to be set up or modernized, legal systems reformed, and civil servants and members of the judiciary trained.

Candidate countries develop timetables for reinforcing the institutions, administrations and judicial systems responsible for implementing the *acquis* as part of the pre-accession strategy.

Candidate countries include: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, Slovenia and Turkey.

## EU LEGISLATION

There are different types of legislation that can be adopted by the EU institutions. Briefly, these include:

- Regulations—these contain general and abstract provisions; they are binding in their entirety, and directly applicable in all member states. Therefore, without any further action on the part of the member states, a regulation becomes effective on the date specified in it.
- Directives—bind member states as to the objectives to be achieved, and obligate the national authorities to transpose the directive into national law, but leave the national authorities the power to choose the form and the means to be used. “Old approach” directives contain the applicable standards, “New approach” directives include the broad guidelines, but the standards are developed separately. (More on this in the Standards section, below.)
- Decisions—these tend to be highly specific, and are binding in their entirety on those to whom they are addressed. They may be addressed to any or all member states, undertakings, or to individuals.
- Recommendations and opinions—these do not formally constitute part of EU law and are not binding.

The starting point of any legislation is a suggestion by the Commission, the Council or the Parliament—followed by the decision by the Commission to take up an issue and draft a proposal. Often the legislation is required by as part of a policy commitment or a program. Any proposed legislation must have a legal basis and correspond to a treaty article. The proposal must be justified in terms of the subsidiarity principle<sup>3</sup> and financial implications.

---

<sup>3</sup> The subsidiarity principle is intended to ensure that decisions are taken as closely as possible to the citizen. Is action at Community level justified in the light of the possibilities available at national, regional or local level? The Union does not take action (except in the areas which fall within its exclusive competence) unless it is more effective than action taken at national, regional or local level.



A mid-management official in the lead directorate-general is responsible for preparing the initial draft of the proposal. This person coordinates with other interested DGs and parties. The draft is reviewed by the official's superiors and when all directly-involved Commission interests have given their approval, the draft is then sent to the *cabinet* (direct support office) of the responsible Commissioner. The cabinet reviews the document prior to passing it to the Commissioner. When the Commissioner is satisfied, the text is then scrutinized by the *chefs de cabinet* at their weekly meeting. The Commissioners may adopt it by written procedure if it is uncontroversial; or they may debate it, accept it, reject it, or send it back to be reworked.

When accepted, the proposal is then published and submitted to the Council of Ministers for a decision and to the European Parliament (and also, possibly, to the Economic and Social Committee and the Committee of Regions) for their opinions. The opinion of the European Parliament must be known prior to formal adoption of the proposal by Council.

In 1999, a study of environmental policy proposals (McCormick) found that the development of proposals can take from six to seven years.

Also, it should be noted that the Commission publishes discussion documents, called Green Papers and White Papers, defined as follows:

- Green Papers—Communications published by the Commission on a specific policy area. Primarily they are documents addressed to interested parties, organizations and individuals, who are invited to participate in a process of consultation and debate. In some cases they provide an impetus for subsequent legislation.
- White Papers—Documents containing proposals for Community action in a specific area. They often follow a Green Paper. While Green Papers set out a range of ideas presented for public discussion and debate, White Papers contain an official set of proposals in specific policy areas and are used as vehicles for their development.

Several papers of interest are noted in the Reference section of this document.

## **DG Environment**

Brussels, Belgium

Director-general: James Curry (until 1 October 2001, successor not yet named)

Commissioner: Margot Wallström

The Sixth Environment Action Program defines environment policy from 1 January 2001 through 31 December 2010 and is entitled “Our future, our choice.” It speaks of looking beyond the legislative approach to a strategic approach, using a range of instruments to influence decisions. Five avenues of strategic action are proposed, with some relevant specific actions noted as sub-bullets:

- Improving the implementation of existing legislation
  - A “name, shame and fame” strategy on the implementation of environmental law<sup>4</sup>
- Integrating environmental concerns into other policies
- Working closer with the market
  - Encouraging a wider uptake of the Eco-Management and Audit Scheme (described later) and voluntary commitments
  - Encouraging companies to publish their performance<sup>5</sup>
  - Adopting legislation on environmental liability
- Empowering people as private citizens and helping them to change behavior
  - Improving the quality of environmental information
- Taking account of the environment in land-use planning and management decisions.

The Sixth Environment Action Program focuses on four priority areas for action:

- Climate change, including making increased use of renewable energy sources, establishment of an EU-wide emissions trading scheme by 2005 and a review of energy subsidies.
- Biodiversity
- Environment and health, including developing a new system for the evaluation and risk management of new chemicals
- Sustainable management of resources and wastes, including a tax on resource use, a strategy for waste recycling, and integration of waste prevention into the integrated product policy strategy

A free bimonthly publication, entitled “Environment for Europeans” is available from DG-Environment. See <<http://europa.eu.int/comm/environment/news/efe/index.htm>>

---

<sup>4</sup> This refers to the “naming and shaming” of the member states who have been lax in implementing the necessary laws.

<sup>5</sup> Commission Recommendation of 30 May 2001 (2001/453/EC) urges companies to recognize, measure and disclose environmental issues in their annual reports.

## **DG Energy and Transport (DG-Tren)**

Brussels, Belgium

Director-general: François Lamoureux

Commissioner: Loyola de Palacio

DG-Tren, which has been in operation since 1 January 2000, is the result of merging the Directorates-general for Transport and Energy. DG-Tren has a staff of approximately 680 persons, divided into seven directorates. The programs managed account for € 850 million, focusing on trans-European networks, technological development and innovation. Specific goals of DG-Tren include:

- finally completing the internal market for energy and transport, including the creation of a fully integrated market,
- ensuring that there is sustainable development in transport and energy, including the promotion of biofuels,
- deploying the major networks within Europe, including further development of trans-European transport and energy networks,
- boosting safety,
- making enlargement work, and
- expanding practical international cooperation, including a strategic partnership with Russia concerning energy and action on interlinking transport and energy networks.

DG-Tren and the EC have been working for years on a tax on carbon dioxide emissions and energy. The objective would be to limit the emissions of greenhouse gases and promote the efficient use of energy by introducing in the member states a harmonized tax. Products subject to the tax would include:

- electricity and heat generated in hydroelectric installations with a capacity of over 10 MW or in nuclear power stations,
- coal, lignite, peat and their derivatives,
- natural gas,
- mineral oils, and
- ethyl and methyl alcohol obtained by distillation by fossil fuels.

Raw materials or renewable sources of energy would not be subject to the tax.

Although the tax would be introduced at the Community level, it would be levied by the member states. The specific chargeable event is extraction, production or importation and the tax is to be chargeable when products are released for consumption or when shortages are recorded. Fifty percent of the taxable amount is to be based on the products' carbon content, and the other half on their energy content. The tax would be in addition to existing harmonized excise duties, and the member states may apply higher taxes.

Although discussions first began on harmonized energy taxes in 1993, movement on European-wide taxes has been slowed by member states' internal politics. Most recently, Spain has insisted that such taxes be linked to functioning internal electricity and gas markets and a full opening of the French energy market. The Belgian presidency has encouraged "enhanced cooperation," whereby 10 or 11 of the member states could go ahead with a harmonized EU energy tax. But since even this measure will require unanimous approval, it could be delayed.

Of the member states, the Scandinavian countries, the Netherlands, UK, Germany, France and Italy have introduced carbon or climate taxes. Spain, Portugal, Ireland, Greece and Belgium have not.

### **EUROPEAN ENVIRONMENT AGENCY (EEA)**

Kongens Nytorv 6  
DK-1050 Copenhagen K, Denmark  
Domingo Jiménez-Beltrán, Executive Director  
4533-367-100  
4533-367-199 (fax)  
<http://www.eea.eu.int/>

The EEA is the environmental information reference center of the EU. Its mission is “to monitor the state and trends of the environment in Europe and support the European Union and member countries in improving their environmental policy and its implementation,” and provide reliable information on Europe’s environment. Information for the public is provided via its public web service.

The EEA Multi-annual Work Program 1998–2003 includes five broad program areas:

- Topic Databases and Reporting—Projects in this area focus on improving monitoring and environmental reporting for different environmental media (e.g., air, water, nature, soil).
- Integrated Assessment—Assessment projects provide in-depth analysis on particular environmental problems (e.g., climate change), limited geographical areas (e.g., Mediterranean), sector (e.g., transport) or instruments (e.g., action plans and measures), with the aim of providing support to the development and implementation of environmental policies. Reports are primarily driven by policy needs.
- Periodical Reporting—Comprehensive reports which present key information and an integrated assessment of the state of the environment, the pressures, driving forces and societal responses in Europe. These reports aim at giving a broad overview of the environmental status and trends. Two major reports appear at regular intervals:
  - State and Outlook on Europe’s Environment reports (every five years)
  - Environmental Signals reports, which update key environmental indicators (annual).
- Reporting System Support—Produces guidelines, methodologies and data models that are the common tools used in other EEA program areas.
- Service and Network Infrastructure—Provides the internal EEA IT infrastructure and the telematics capacities.

The EEA aims to assist the Community in its attempts to improve the environment, move towards sustainability, and integrate environmental aspects into economic policies. For example, Council Decision 97/101/EC of 27 January 1997 establishes a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member states. The EEA handles the operation and implementation of the information system.

Atmospheric pollutants taken into consideration in the assessment and management of ambient air quality (Directive 96/62/EC) include:

- |  |                             |
|--|-----------------------------|
| • SO <sub>2</sub>  | • Benzene                   |
| • NO <sub>2</sub>  | • Carbon monoxide           |
| • Fine particulate matter such as soot (including mw 10) | • Polyaromatic hydrocarbons |
| • Suspended particulate matter                           | • Cadmium                   |
| • Lead   | • Arsenic                   |
| • Ozone  | • Nickel                    |
|  | • Mercury                   |

## REGULATORY REGIME—THE INTERNAL ENERGY MARKET

Although the end product of electricity generation is always electricity, there are a number of different ways to produce electricity for the energy market, including:

- **Fossil fuel-fired plants** include solid fuels (coal), gas and oil electricity generating facilities, along with facilities that utilize lignite and peat. There are four different technologies that are used:
  - Steam cycles.
  - Gas turbines. The exhaust gases retain a significant amount of heat energy—this heat energy can be used.
  - Combined cycle plants. A gas turbine drives one generator directly; the hot exhaust gases are used to boil steam, thereby recovering the heat. The steam is then fed to a steam turbine driving a second generator. The overall efficiency of electricity production is high.<sup>6</sup>
  - Cogeneration or combined heat and power (CHP). Steam and/or gas turbines can be used, and the fuel source can be fossil fuel, biomass or nuclear, although most modern CHP units use natural gas as fuel. Some of the heat produced is used to generate electricity, and as much as possible of the rest is directed to a significant heat load, such as an industrial process or a heating network.
  
- **Renewable energy sources (RESs)** include wind power, solar power, hydropower and different forms of biomass.<sup>7</sup> Certain types of RESs, such as wind power and solar power, cannot be scheduled for times of peak demand due to their intermittent characteristics. However, these forms of energy are normally indigenous and therefore contribute to a country's security of supply—but how much do they actually contribute? RESs currently provide 10 percent of the EU's electricity needs, although, as described below, the Council and Parliament have called for non-fossil fuel burning energy technology to provide 22 percent of Europe's needs by 2010.

In December 2000, the European Commission issued new guidelines designed to give member state governments more leeway when it comes to providing subsidies for RES companies investing in environmental protection. The guidelines apply from 2001 to 2008, and allow an increase in state subsidies for RESs from 30 percent to 40 percent of investment costs.

In Europe, most countries are highly dependent on imports (except for the UK, Norway, Netherlands, Denmark and France), and all European countries are expected to rely increasingly on imports.

---

<sup>6</sup> In November 2000, the European Commission approved a 5-year oil tax exemption for combined-cycle power plants in Germany, stating that the exemption qualified under the guidelines for state aid for environmental protection.

<sup>7</sup> Biomass refers to vegetable matter that can be used as a fuel for energy recovery, and includes certain vegetable waste from agriculture, forestry, food processing industry, pulp and paper industry, cork waste and wood waste.

## **Internal Market Directive—Electricity**

[http://europa.eu.int/eur-lex/en/lif/dat/1996/en\\_396L0092.html](http://europa.eu.int/eur-lex/en/lif/dat/1996/en_396L0092.html)

### **Council Directive 96/92/EC: Concerning common rules for the internal market in electricity**

(rule effective 8 January 1997; then by 19 February 1999, 13 of the 15 members states open up to 25 percent of their electricity markets to competition)

Everybody agrees: this is the directive that has had the most effect on power generation facilities. The whole idea of the internal market is to ensure the free movement of goods, persons, services and capital. An important facet is the internal electricity market—this directive establishes common rules for the generation, transmission and distribution of electricity, including market access and procedures applicable to calls for tender and the granting of authorizations and system operation.

Throughout the directive, preference is given to renewable energy sources, CHP, and in some cases, indigenous energy sources.

The main sections of the directive are summarized as follows:

**Generation.** For the construction of new facilities, member states may opt for either an authorization procedure and/or a tendering procedure; criteria are described for both, including safety and security of supply, environmental effects, the nature of the primary source. Tenders must be published for at least six months prior to the closing date.

**Transmission system operation.** Member states, or their undertakings, must designate a system operator to be responsible for operating, ensuring the maintenance of, and, if needed, developing the transmission system and interconnectors in a given area to guarantee security of supply. Technical rules must be developed and published to ensure system interoperability. The system operator is independent from other activities not related to the transmission system, and may not discriminate between users.

**Distribution system operation.** Member states may impose on distribution companies to supply customers in a given area. The tariff for such supplies may be regulated to ensure equal treatment of customers. Member states, or their undertakings, must designate a system operator to be responsible for operating, ensuring the maintenance of, and, if needed, developing the distribution system and interconnectors. Again, the system operator may not discriminate between users.

**Unbundling and transparency of accounts.** Member states, or their designated authorities, have the right of access to accounts of generation, transmission or distribution undertakings as needed to carry out their checks. Electricity undertakings must audit and publish their annual accounts in accordance with national laws. If they are not legally required to publish their accounts, a copy of the accounts must be available for public review. Integrated undertakings must keep separate accounts for generation, transmission and distribution activities and consolidated accounts for non-electricity activities. Member states which designate a single buyer (legal person responsible for the unified management of the transmission system and/or centralized electricity purchasing and selling) must require the single buyer to operate separately from the generation and distribution activities, and must ensure that there is no flow of information between the single buyer activities and the generation and distribution activities.

**Organization of access to the system.** In the case of negotiated access to the system, member states must take measures to assure that electricity producers, authorized undertakings and eligible customers can conclude supply contracts with each other. System operators must publish an indicative range of prices for use of the transmission and distribution systems. Member states may also opt for a regulated system of access procedure giving eligible customers a right of access on the basis of published tariffs for the use of transmission and distribution systems. In the case of the single buyer

scenario, member states shall publish a non-discriminatory tariff for the use of the transmission and distribution, and eligible customers and independent producers can negotiate access. The single buyer may be obliged to purchase electricity contracted by an eligible customer from a producer inside or outside the territory.

Member states are obliged to ensure an opening of their electricity markets and report annually to the Commission. The share of the national market is calculated on the basis of the Community share of electricity consumed by final consumers consuming more than 40 GWh<sup>8</sup> per year (on a consumption-site basis and including autoproduction). The share of the national market is progressively increased over a period of six years. The increase is calculated by reducing the Community consumption threshold of 40 GWh to a level of 20 GWh annual electricity consumption in 2000 and to a level of 9 GWh annual electricity consumption in 2003. Member states may impose public service obligations on undertakings.

---

<sup>8</sup> In practice, 2–3 industrial customers.

## **Internal Market Directive—Natural Gas**

### **Directive 98/30/EC of the European Parliament and of the Council of 22 June 1998 concerning common rules for the internal market in natural gas**

[http://europa.eu.int/eur-lex/en/lif/dat/1998/en\\_398L0030.html](http://europa.eu.int/eur-lex/en/lif/dat/1998/en_398L0030.html)

The objective of the directive, which is quite parallel to the Internal Market Directive—Electricity, is to establish common rules for the transmission, distribution, supply and storage of natural gas. It is applicable to the natural gas sector, including liquefied natural gas, access to the market, operation of systems, and the criteria and procedures applicable to the granting of authorizations for transmission, distribution, supply and storage.

Member states may impose obligations on undertakings which may relate to security of supply, regularity, quality and price of supplies and to environmental protection. Also, member states are required to specify eligible customers (and publish such criteria) and must ensure that at least the following customers are designated as eligible customers:

- Gas-fired power generators, irrespective of their annual consumption level. However, in order to safeguard the balance of their electricity market, the member states may introduce a threshold for the eligibility of CHP producers and then must notify the Commission.
- Other final customers consuming more than 25 million cubic meters of gas per year on a consumption-site basis.

The definition of eligible customer must result in an opening of the market equal to at least 20 percent of the total annual gas consumption of the national gas market. Then, after 5 years, this must increase to 28 percent of the total annual gas consumption; and to 33 percent after 20 years. But if the market opens more than 30 percent, the member state may modify the definition of eligible customer to lower the market opening percentage.

The EU's potential gas supplies include the major producers Algeria, Russia, Norway and the Netherlands, and also Libya, Egypt, Oman and the Middle East, central Asia, Nigeria and the Caribbean basin.



## **REGULATORY REGIME—GENERATION AND ENVIRONMENTAL REGULATIONS**

Like North American facilities, European electricity-generating facilities are subject to a long list of regulatory requirements. The following is a description of some of the most important requirements, but is by no means an exhaustive list.

### **PROMOTION OF ELECTRICITY FROM RENEWABLE ENERGY SOURCES**

#### **Directive on the promotion of electricity from renewable energy sources in the internal electricity market**

[http://europa.eu.int/eur-lex/en/com/dat/2000/en\\_500PC0279.html](http://europa.eu.int/eur-lex/en/com/dat/2000/en_500PC0279.html)

On 7 September 2001 the Council approved a directive that obliges member states to meet 12 percent of their gross internal energy consumption from RES by 2010. The directive also requires 22.1 percent of the electricity produced in the EU to be produced by RES.

The directive also includes measures to:

- introduce a system for certifying green electricity,
- create accompanying measures designed to create suitable conditions for the introduction of renewable energy resources while respecting competition rules,
- accelerate the authorization procedure for the establishment of production centers for green electricity, and
- guarantee that the calculation of connection costs for new producers are nondiscriminatory.

### **PROMOTION OF COMBINED HEAT AND POWER**

#### **Council Resolution on a Community strategy to promote combined heat and power**

[http://europa.eu.int/eur-lex/en/lif/dat/1998/en\\_398Y0108\\_01.html](http://europa.eu.int/eur-lex/en/lif/dat/1998/en_398Y0108_01.html)

On 18 December 1997, the Council approved a resolution to encourage the improved use of CHP and included an indicative target to double the overall share of CHP in the Community by the year 2010.

## **FACILITY SITING**

According to a coal industry official, there is currently an oversupply of electric power and the price has decreased to the point of marginal cost due to market liberalization. Interest in construction of new facilities is cautious at best—the most difficult question is deciding on an appropriate place. Incumbent facilities with large numbers of captive customers often prefer to revamp an existing facility to lessen the necessary paperwork.

But a recent *Financial Times Energy* study, “Power Markets in Europe,” found that demand growth for electricity in Europe is expected to require an additional 69,000 MW of generating capacity to be built.

**Table 1. Footprint of electricity-generating facilities according to type of plant**

Type of plant (single 1000 MW)	Land required (km <sup>2</sup> )	Comment
Nuclear or fossil fuel	1–4	
Solar	50	50 km <sup>2</sup> of solar panels
Wind	250–500	Visual intrusion, but approximately 98 percent of land area available for other purposes
Biomass	4000–6000	Required land area under cultivation with energy crop

*Source: Eurelectric*

Large industrial companies lean towards CHP, as the regulations encourage. But the Internal Electricity Market directive, and subsequent opening of the electricity market, is driving most decisions.

Historically, siting of coal-based facilities has naturally gravitated to either near the mines or near railway tracks or near rivers. In Germany, the network is especially extensive, as the electricity travels a maximum of approximately 50 km. In the Netherlands, the distribution is linked to consumption, and power generation is also spread relatively evenly over the country.

The specifics of siting electricity generation facilities is left to the individual member states. However, the European Commission is interested. Before construction, power plants are subject to Environmental Impact Assessment and often public planning inquiries.

Regulations covering facility dismantling depends, of course, on the type of facility but also on local regulations.

#### **ENVIRONMENTAL IMPACT ASSESSMENT DIRECTIVE**

[http://europa.eu.int/eur-lex/en/lif/dat/1997/en\\_397L0011.html](http://europa.eu.int/eur-lex/en/lif/dat/1997/en_397L0011.html)

Council Directive 97/11/EC amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment; requires the member states to ensure that, prior to consent, projects likely to have significant effects on the environment have been made subject to a development consent procedure and an assessment of the effects. The directive specifically mentions “thermal power stations and other combustion installations with a heat output of 300 megawatts or more” as subject to the directive.

The directive has four main ideas: Project approval procedure, information submittal, transboundary effects, and public consultation.

**Project approval procedure.** Member states must have a procedure for approving projects that have a significant environmental effect.

**Information submittal.** Information to be provided by the developer must include the following:

- A description of the project, including site, design and size, waste production, pollution and nuisances, risk of accident.
- A description of the project, including a description of the physical characteristics of the whole project and the land-use requirements during the construction and operational phases, a description of the main characteristics of the production processes, and an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation) resulting from the project operations.

- An outline of the main alternatives studied by the developer and an indication of the main reasons for this choice.
- A description of the aspects of the environment likely to be significantly affected by the proposed project, including population, fauna, flora, soil, water, air, climatic factors, material assets including architectural and archaeological heritage, landscape and the inter-relation between all of these.
- A description of the likely significant effects of the proposed project on the environment resulting from the existence of the project, the use of natural resources, the emission of pollutants, the creation of nuisances and the elimination of waste.
- A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.
- A non-technical summary of the above information.
- An indication of any difficulties in compiling the above information.

The concerned public must be given an opportunity to provide an opinion prior to the development consent being granted.

**Transboundary effects.** When a member state is aware that a project is likely to have negative effects on another member state, then the affected member state will receive the information applicable to the proposed project and be allowed a reasonable time in which to indicate whether it wishes to participate in the EIA procedure. Or, a potentially affected member state may request the information. If the other state does wish to participate, then the authority and public in the potentially affected member state have the right to comment on the information before any decision is reached by the competent authorities.

**Public consultation.** Regardless of the outcome of the development decision, the competent authorities must make the following information available:

- the content of the decision and any conditions attached,
- the main reasons and considerations on which the decision was based, and
- a description, where necessary, of the main measures to address the major adverse effects.

The directive is due to be reviewed in 2002.

Also, a Council Resolution of 20 November 1978 concerns the mutual exchange of information at Community level on the siting of power plants, and notes the intention of the Commission to organize the mutual exchange of information on problems arising out of the siting of power stations.

### **STRATEGIC ENVIRONMENTAL ASSESSMENT DIRECTIVE**

[http://europa.eu.int/eur-lex/en/dat/2001/l\\_197/l\\_19720010721en00300037.pdf](http://europa.eu.int/eur-lex/en/dat/2001/l_197/l_19720010721en00300037.pdf)

Council Directive 2001/42/EC was adopted by the Parliament and the Council in June 2001, requiring the member states to perform environmental assessment as part of the preparation and adoption of certain plans and programs that are likely to have a significant effect on the environment.

The environmental assessment is applicable for all plans and programs prepared for the energy sector and “which set the framework for future development consent of projects” referenced in the Environmental Impact Assessment Directive, described above.

The environmental assessment is to be carried out during the preparation of a plan or program and before its submission to the legislative process. The assessment must then be taken into account for any decision-making on the proposed plan or program.

Information required under the assessment includes:

- Outline of the contents and objectives of the plan or program
- Relevant aspects of the current state of the environment and likely evolution with the plan or program, including characteristics of the areas likely to be affected
- Any existing environmental problems
- Environmental protection objectives
- Likely environmental effects
- Measures envisaged to reduce significant adverse effects
- Outline of the reasons for selecting the chosen alternatives
- Monitoring envisaged
- Non-technical summary

**Consultations.** The draft plan or program and the environmental report must be made available to the competent authorities and to the public, who are given time to express their opinion on the materials before a final decision is taken. When a member state is aware that a project is likely to have significant effects on another member state, then the potentially affected member state will receive the information applicable to the proposed project and be allowed a reasonable time in which to indicate whether it wishes to participate in the consultation procedure. Or, a potentially affected member state may request the information. If the other state does wish to participate, then the authority and public in the potentially affected member state has the right to comment on the information before any decision is reached by the competent authorities.

**Information on the decision.** When a plan or program is adopted, the following information must be made available to the member states and public that participated in the consultation:

- the plan or program as adopted,
- a statement summarizing how environmental considerations have been integrated into the plan or program and a justification for choosing the plan or program, as adopted, and
- the measures for monitoring.

Member states are required to incorporate this directive into their laws by 21 July 2004, and the Commission intends to prepare the first report on the application and effectiveness of this directive by 21 July 2006.

## **LARGE COMBUSTION PLANT (LCP) / NATIONAL EMISSIONS CEILINGS (NEC) DIRECTIVE**

### **Final Reconciliation Text (2 August 2001)**

Council Directive 88/609/EEC: Limitation of emissions of certain pollutants into the air from large combustion plants, amended by Council Directive 94/66/EC

LCP contact: Brian Brangan (brian.brangan@cec.eu.int)

NEC contact: Lynne Edwards (lynne.edwards@cec.eu.int)

The original Large Combustion Plant Directive came into effect in 1988, limiting the emissions of certain pollutants (including SO<sub>2</sub> and NO<sub>x</sub>) into the air from large combustion plants. In June 2000, the EU environment ministers agreed, after a year of negotiation, to a set of air emission standards to restrict pollution from large power plants and also agreed to national emissions ceilings for 4 substances: sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs) and ammonia (NH<sub>3</sub>).

After a breakdown in negotiations on a revised version of the large combustion plant directive (the countries were unable to agree on how to address existing facilities), the legislation was packaged with a proposed directive on national emission ceilings under a plan that would allow the member states to create an overall limit of SO<sub>2</sub> and NO<sub>x</sub> emissions from existing plants built before 1987.

Large combustion plants are defined as those that produce 50 MW of power or more. These power plants—approximately 2000 power stations and other industrial plants—account for 63 percent of SO<sub>2</sub> emissions in the EU and 21 percent of NO<sub>x</sub> emissions.

The LCP/NEC draft directives were read in Parliament two times. Since there was continuing disagreement, a Conciliation Committee was used. The joint text approved by the Conciliation Committee for both directives is summarized below. These texts are expected to be published in the Official Journal before the end of 2001.

### **Limitation of emissions of certain pollutants into the air from large combustion plants (PE-CONS 3640/01)**

The directive applies to combustion plants designed for energy production with a rated thermal input equal to or greater than 50 MW, irrespective of the type of fuel used, and it includes plants existing before 1987, prior to the old directive. Combustion plants that make direct use of combustion products in manufacturing processes are excluded.

Member states are required to develop appropriate programs for the progressive reduction of total annual emissions from existing plants, including timetables and procedures. These reports must include an overview of:

- all combustion plants covered by the directive,
- SO<sub>2</sub> and NO<sub>x</sub> emissions, expressed as tonnes/year and as concentrations in waste gases,
- measures taken or planned to reduce emissions, and any changes in fuel used,
- changes in operation taken or planned,
- definitive closures of combustion plants taken or planned, and
- where appropriate, emission limit values imposed on existing plants.

All licenses for the construction or operation of new plants contain conditions relating to compliance with emissions levels of SO<sub>2</sub>, NO<sub>x</sub> and dust.

Plants licensed within 12 months of the date of entry into force of the directive will have to comply with the emission limit values for SO<sub>2</sub>, NO<sub>x</sub> and dust fixed in part A of Annexes III to VII.

Plants licensed after 1 July 1987 (“new” plants) and not covered by the paragraph above will have to comply with the emission limit values for SO<sub>2</sub>, NO<sub>x</sub> and dust fixed in part B of Annexes III to VII.

For plants licensed before 1 July 1987 (“existing” plants), the member states have two options, one of which must be taken by 1 January 2008:

- Take appropriate measures to ensure that all licenses for the operation of existing plants contain conditions for compliance with emission values as established for new plants licensed within 12 months of the date of entry into force of the directive (part A of Annexes III to VII).
- Ensure that existing plants are subject to the national emission reduction plan—this is a plan to reduce the total annual emissions of NO<sub>x</sub>, SO<sub>2</sub> and dust from existing plants to the levels that would have been achieved by applying the emission limit values of part A of Annexes III to VII. The plan is based on each plant’s annual operating time, fuel used and thermal input, averaged over the last five years of operations, up to and including 2000. The closure of a plant included in the national emission reduction plan may not result in an increase in the total annual emissions from the remaining plants covered by the plan.

Existing plants (pre-1987 plants) may be exempted from the emission limit values referred to above and from their inclusion in the national emission reduction plan on the following conditions:

- the operator of an existing plant undertakes, in a written declaration by 30 June 2004 to the competent authority, not to operate the plant for more than 20,000 operational hours between 1 January 2008 and 31 December 2015, and
- the operator is required to submit each year a record of the used and unused time allowed for the plant’s remaining operational life.

Member states may require compliance with more stringent emission limit values and time limits for implementation, including other pollutants or the adaptation of the plant to technological progress.

By 31 December 2004, in consideration of protecting human health and the European Community’s environmental objectives for acidification and air quality, the EC intends to submit a report to Parliament in which it assesses:

- the need for further measures,
- the amounts of heavy metals emitted by large combustion plants,
- the cost-effectiveness, feasibility, costs, advantages of further emission reductions in this sector as compared to other sectors,
- the competition situation, and
- related proposals.

The directive requires the member states to ensure that the technical and economic feasibility of providing for CHP is examined, and, where feasibility is confirmed, to develop installations accordingly.

The directive also contains provisions for:

- malfunction or breakdown of abatement equipment,
- emission limit values for plants with multi-firing units,
- control of waste gases via a stack,

- application of emission limit values of part B of Annexes III to VII to a combustion plant extension of at least 50 MW, and
- monitoring.

### **National emission ceilings for certain atmospheric pollutants (PE-CONS 3641/101)**

The objective of the directive is to limit emissions of acidifying and eutrophying pollutants and ozone precursors by applying a set of national ceilings for each member state for SO<sub>2</sub>, NO<sub>x</sub>, VOCs and NH<sub>3</sub> emissions, taking the years 2010 and 2020 as benchmarks.

The Commission intends to report to the Parliament and Council on the progress of the member states towards the emission ceilings.

By 2010, the member states must limit their annual national emissions of SO<sub>2</sub>, NO<sub>x</sub>, VOCs and NH<sub>3</sub> to levels not greater than the emissions noted in Annex I of the directive. They are expected to achieve these goals through the establishment of national programs on their intended policies, adopted and planned. Also, the member states are required to prepare and annually update national emission inventories and projections for the 4 pollutants. These reports are required to be completed by 31 December, beginning one year after entry into force of the directive. Likewise, the directive also details reports requirements for the Commission on the implementation and the impact of the directive on the particular member states and sectors.

### **INTEGRATED POLLUTION PREVENTION AND CONTROL (IPPC) DIRECTIVE**

#### **Council Directive 96/61/EC: Concerning integrated pollution prevention and control (effective 15 October 1996)**

[http://europa.eu.int/eur-lex/en/lif/dat/1996/en\\_396L0061.html](http://europa.eu.int/eur-lex/en/lif/dat/1996/en_396L0061.html)

EC contact: Magnus Gislev (magnus.gislev@cec.eu.int)

The IPPC directive attempts to minimize pollution from various point sources throughout the European Union. All installations covered by the directive are required to obtain an authorization (permit) from the authorities in the EU countries. The permits are based on the concept of Best Available Techniques (BAT).

This directive is applicable to combustion facilities with a rated thermal input exceeding 50 MW, but the material requirements of another directive (Directive 88/609/EEC) apply for existing installations until 31 December 2003.

The main sections of the IPPC directive are summarized as follows:

**Permits for new, existing and significant changes to facilities.** The directive requires an integrated approach to air, water and land pollution. A permit application must include a description of:

- the installation and its activities;
- the raw and auxiliary materials, other substances and the energy used in or generated by the installation;
- the sources of emissions from the installation;
- the condition of the site of the installation;
- the nature and quantities of foreseeable emissions from the installation into each medium, as well as the identification of significant effects of the emission on the environment;

- the proposed technology and other techniques for preventing or, where this not possible, reducing emissions from the installation;
- where necessary, measures for the prevention and recovery of waste generated by the installation;
- further measures planned, including: all appropriate measures against pollution, avoidance of waste production, efficient use of energy, prevention of accidents and limiting of their consequences, return of the site to a satisfactory condition at the end of the useful life of the facility; and
- measures planned to monitor emissions into the environment.

The permit issued by the member state must include emission limit values for certain pollutants (listed below in Table 2, Main polluting substances to be taken into account for fixing emission limit values) and the emission limit values “shall be based on best available technologies” without prescribing a specific technology. The permit must also include appropriate monitoring and contingencies for abnormal operating conditions (start-up, leaks malfunctions, momentary stoppages and definitive cessation of operations).

**Table 2. Main polluting substances to be taken into account for fixing emission limit values**

<b>Air</b>	<b>Water</b>
Sulphur dioxide and other sulphur compounds	Organohalogen compounds and substances which may form such compounds in the aquatic environment
Oxides of nitrogen and other nitrogen compounds	Organophosphorus compounds
Carbon monoxide	Organotin compounds
Volatile organic compounds	Substances which have been proved to possess carcinogenic or mutagenic properties or properties which may affect reproduction in or via the aquatic environment
Metals and their compounds	Persistent hydrocarbons and persistent and bioaccumulable organic toxic substances
Dust	Cyanides
Asbestos (suspended, fibers)	Metals and their compounds
Chlorine and its compounds	Arsenic and its compounds
Fluorine and its compounds	Biocides and plant health products
Arsenic and its compounds	Materials in suspension
Cyanides	Substances which contribute to eutrophication (in particular, nitrates and phosphates)
Substances which have been proved to possess carcinogenic or mutagenic properties or properties which may affect reproduction via the air	Substances which have an unfavorable influence on the oxygen balance (and can be measured using parameters such as BOD, COD, etc.)
Polychlorinated dibenzodioxins and polychlorinated dibenzofurans	



The member states must periodically review and, as necessary, update the permit conditions. Reasons to review permit conditions include:

- the pollution caused by the installation is of such significance that the existing emission limit values of the permit need to be revised or new values included,
- substantial changes in the best available techniques make it possible to reduce emissions significantly without imposing excessive costs,
- the operation safety of the process or activity requires other techniques to be used, and
- new laws or regulations.

Member states are required to ensure compliance with the permit conditions, including inspections, as needed. Also, the operator must provide the authorities with monitoring results and accident information.

**Access to information, public participation and information exchange.** Permit applications for new installations or for significant changes to existing installations must be made available for public comment before the competent authority reaches its decision. Monitoring information must be made available to the public.

The directive also requires an inventory of the principal emissions and sources to be published every three years by the Commission on the basis of data supplied by the member states.<sup>9</sup>

The information exchange described in the directive concerns best available technologies, associated monitoring and developments in these areas. The EC organizes an exchange of information between experts from the member states, industry and environmental organizations. This work is coordinated by the European IPPC Bureau, based in Seville, which is divided into some 32 sectors. For each sector it takes approximately two years to produce a best available techniques reference document (Bref). All Brefs are expected to be completed by the end of 2004: as of the end of August 2001 nine were completed, eight more were in draft stage and work has started on another seven where no draft is available (although 13 were scheduled to be completed by that time). The 400-page draft Bref for large combustion plants, currently dated March 2001, is cautiously expected to be finished in 2002.<sup>10</sup>

---

<sup>9</sup> The inventory has been further elaborated in Commission Decision 2000/479/EC, on the implementation of a European Pollutant Emission Register (EPER—[http://europa.eu.int/eur-lex/en/lif/dat/2000/en\\_300D0479.html](http://europa.eu.int/eur-lex/en/lif/dat/2000/en_300D0479.html)). EPER, which incorporates most of the elements of a PRTR, requires member states to send their first report to the Commission in June 2003, reporting on 2001 emissions. It is the intention of the Commission to evolve EPER into a full PRTR system by approximately 2007, including obligatory annual reporting by facilities on a full range of releases and transfers.

<sup>10</sup> Minutes from the kick-off meeting for the combustion plant Bref, note that the IPPC Bureau is considering addressing the following pollutants:

*Air*

Particulate matter  
Dust as stack emissions (PM10 and PM2.5)  
Sulphur oxides  
NO<sub>x</sub>, NO, NO<sub>2</sub>  
Heavy metals  
CO, CO<sub>2</sub>  
Methane  
Hydrogen fluoride  
Halide compounds  
Unburned hydrocarbons (such as soot)  
VOCs  
Dioxins and / or POPs

*Water*

Suspended solids  
Heavy metals  
Salts (chloride and sulphate)  
Nitrogen (total)  
Oxidizing biocides from the cooling water system  
Heat to the aquatic environment  
Others (such as phosphates, dioxins, PAHs)

**Transboundary effects.** When a member state is aware that the operation of an installation is likely to have negative effects on another member state, then the affected member state will receive the information applicable to the installation, and that information will serve as the basis for consultation. Or, a potentially affected member state may request the information. The public in the potentially affected member state has the right to comment on the information before any decision is reached by the competent authorities.

**Community emission limit values.** The Council will set emission limit values for the categories of installations covered by the directive (except for landfills) and for certain pollutants. In the absence of emission limit values defined per the directive, a listing of other directives is presented and the emission values listed in those directives are applicable.

The directive defines “emission limit values” as “the mass, expressed in terms of certain specific parameters, concentration and/or level of emission, which may not be exceeded during one or more periods of time . . . The emission limit values for substances shall normally apply at the point where the emissions leave the installation, any dilution being disregarded when determining them . . .”

The fifteen member states had until the end of October 1999 to adjust their national legislation in line with the directive. From that date, the directive applies to all new installations, as well as existing installations that intend to carry out changes that may have significant negative effects on humans or the environment. The directive does not immediately apply to *other existing* installations. These have been granted an additional 8 years of grace. However, by August 2001, several member states have not yet reported to the European Commission that this has been done and some countries have still only partially transposed the directive. The most serious delays have occurred in Ireland, Belgium (the Wallonian region), Luxembourg, Spain and Greece.

#### **SULPHUR CONTENT IN LIQUID FUELS**

[http://europa.eu.int/eur-lex/en/lif/dat/1999/en\\_399L0032.html](http://europa.eu.int/eur-lex/en/lif/dat/1999/en_399L0032.html)

**Council Directive 1999/32/EC of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels and amending Directive 93/12/EEC (effective 1 July 2000)**

The purpose of this directive is to reduce the emissions of sulphur dioxide resulting from the combustion of certain types of liquid fuels, and reduce the harmful effects of such emissions on man and the environment. Naturally present in oil and coal, sulphur from these fuels is recognized as the main source of sulphur dioxide emissions. Since the EC and the member states are parties to the UN-ECE Convention on Long-Range Transboundary Air Pollution, they are subject to a requirement to reduce sulphur dioxide emissions by at least 30 percent. This directive specifically focuses on gas oils, aviation fuels, heavy fuel oil, bunker fuel oils, and marine gas oils.

Member states must ensure that, as of 1 January 2003, heavy fuel oils are not used if their sulphur content exceeds 1 percent by mass. Under certain circumstances, a member state may authorize a heavy fuel oil with a sulphur content of between 1 and 3 percent by mass, but the directive is specific and emphatic: a member state may use heavy fuel oil with a sulphur content between 1 and 3 percent by mass only if the emissions do not contribute to critical loads being exceeded in *any* member state, and the plant should have a permit. The directive however, does not apply to new plants covered under other directives, or other combustion plants where the emissions of sulphur dioxide are less than or equal to 1700 mg/Nm<sup>3</sup> at an oxygen content in the flue gas of 3 percent by volume on a dry basis.

If a member state must suddenly change its supply of crude oil, petroleum products or other hydrocarbons and therefore is unable to apply the maximum sulphur content limits, the Commission must be informed and a higher limit may be authorized.

Sampling of the sulphur content of fuels is required, and specific reference methods are noted. Member states must report annually to the Commission on the sulphur content of liquid fuels within the scope of the directive within their territory. The Commission intends to prepare a report for Council and Parliament by 31 December 2006.

The directive described above is complemented by Council Directive 1999/30/EC relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (effective 12 May 2000). This regulation requires the member states to take the appropriate measures to assure that concentrations of these pollutants in ambient air do not exceed certain limit values.

### **GREENHOUSE GAS EMISSIONS TRADING—PROPOSED DIRECTIVE**

**Proposed Directive establishing a framework for greenhouse gas emissions trading within the European Community and amending Council Directive 96/61/EC (IPPC Directive)  
COM(2001)581**

**[http://europa.eu.int/comm/environment/climat/com/01581\\_en.pdf](http://europa.eu.int/comm/environment/climat/com/01581_en.pdf)**

Emissions trading is an instrument for environmental protection and one that impairs competitiveness the least. An EU-wide emissions trading scheme will provide a uniform price for an allowance across the whole trading scheme. There are two central principals in the 23 October 2001 EC proposal: First, all installations covered must have a greenhouse gas “permit” that is attached to a specific installation or site. Secondly, greenhouse gas “allowances,” denominated in metric tonnes of carbon dioxide equivalent, will entitle the holder to emit a corresponding quantity of greenhouse gas—and the allowances are transferable.

Initially, only carbon dioxide is addressed. Other greenhouse gases (methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride) will be included later. The proposed directive is expected to cover 46 percent of the estimated EU carbon dioxide emissions in 2010, and roughly 4000–5000 installations. Notably, some significant carbon dioxide emitters that were not covered by the IPPC directive (namely power and heat generation installations between 20–50 MW) are included under the proposed emissions trading directive.

The main sections of the directive are summarized as follows:

**Greenhouse gas emission permits.** From 1 January 2005 onwards, any installation engaged in an Annex 1 activity (including energy activities: combustion installations with a rated thermal input exceeding 20 MW, except hazardous or municipal waste installations) must hold a permit to do so. The issuance of permits will be handled in a single procedure with permits issued under the IPPC directive. (The IPPC directive covers greenhouse gas emissions—so a revision to the IPPC directive is included to assure a smooth overlap between the directives.)

**National allocation plan.** The way the initial allocation is done is vital. By 31 March 2004, each member state will develop a national plan stating the total quantity of allowances that it intends to allocate (for the 3-year period beginning 1 January 2005 and for the 5-year period beginning 1 January 2008) and how it proposes to allocate them. The proposed directive spells out objective and transparent criteria on which the plan must be based. The plans must be published and public comment sought. The plans are also communicated to the European Commission, which may reject all or a portion within 3 months.

**Allowances.** For the 3-year period beginning 1 January 2005, member states shall allocate allowances free of charge. At this point, the quantities of allowances issued would not be harmonized. (The total quantity of allowances issued under the proposal would be left up to the member states. The Burden Sharing Agreement redistributes effort by member states to reflect Community solidarity.)

The Commission will specify a harmonized method of allocation for the 5-year period beginning 1 January 2008, coinciding with the commencement of international emissions trading under the Kyoto protocol in 2008.

By 31 March of each year, the operator of each installation must surrender a number of allowances equal to the total emissions from that installation during the previous calendar year; and the allowances will be cancelled. The allowances will exist only in electronic form. A system of linked national registries will ensure the accurate handling of allowances. The Commission will designate a Central Administrator to maintain an independent transaction log recording the handling of allowances.

**Compliance.** Until 2008, the penalty for failure to surrender sufficient allowance to cover verified emissions would be € 50 per excess tonne, or twice the average market price during a pre-determined period. Once the Kyoto Protocol commitment period begins in 2008, the penalty increased to € 100 per excess tonne.

**Links to other market-based instruments.** The proposed emissions trading scheme should be compatible, but not integrated, with another market-based instrument under development in several member states, the “Tradable Renewable Certificate”. (Since renewable sources do not emit greenhouse gases, they are not subject to the proposed directive.)

## ENVIRONMENTAL MANAGEMENT SYSTEMS

An important advantage of environmental management systems is the allowance for some regulatory relief from the enforcement authorities: an accreditation may be recognized as proof of compliance with certain environmental legislation. There are two environmental management systems recognized as effective and widely applied in Europe: ISO 14001 and the EU Eco-Management and Audit Scheme (EMAS). Like ISO 14001, EMAS is voluntary (but once a company signs up, it becomes obligatory for them), performance-oriented, but generally considered to be stricter than ISO 14001 and applicable only to EU member states. EMAS goes further than ISO 14001 in its requirements for transparency, performance improvement, employee involvement, legal compliance and communication with stakeholders, including performance reporting.

EMAS has been completely revamped recently, and the new EMAS regulation was adopted in February 2001. Some of the main improvements include:

- integration of ISO 14001 as the environmental management system required by EMAS, so that progressing from ISO 14001 to EMAS will be smoother and not entail duplication,
- adoption of an EMAS logo, and
- involvement of employees in EMAS implementation and strengthening the role of the environmental statement to improve communication between the registered organizations and interested parties.

While the official documents note that ISO14001 and EMAS are not in competition, they have different emphasis; there are some undercurrents of “continental pride” with the EMAS system. EMAS is seen as more prestigious than ISO 14001. In fact, European companies often use ISO 14001 as a step to obtaining to EMAS registration. This being said, EMAS is most popular in Germany, with ISO certification more popular in other European countries.<sup>11</sup> German companies make up approximately three quarters of all eco-audited companies in the EU and they may be granted breaks in periodic state controls of emissions or waste management.

A report completed by Eurelectric in September 1999 concluded that a significant number of electricity industry sites have adopted or are in the process of adopting one or even both standards.

---

<sup>11</sup> The new EMAS regulation and links to national EMAS web sites can be found at <http://europa.eu.int/comm/environment/emas>

## STANDARDIZATION

With the creation of the single market in Europe and the beginning participation of the central and eastern European countries to join the European community, Europe now hosts the largest regional standards bodies in the world.

There are three European standardization bodies recognized as the authorities in the area of voluntary technical standardization: the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (Cenelec) and the European Telecommunications Standards Institute (ETSI). Each prepares European standards in specific sectors.

CEN is the focal point for standardization in all issues except electrotechnology and telecommunications. Its work includes biotechnology, building and civil engineering, chemistry, environment, workplace health and safety, mechanical engineering, quality and measurement, among others. It is also working on standards for alternative energy sources, solid and liquid biofuels and fuels recovered from solids.

Cenelec is the focal point for electrotechnology. In a slightly different world, Cenelec would have been a division of CEN. In fact, they are housed across the street from each other and share meeting facilities. Cenelec believes that although its work products are widely known, it itself is relatively unknown and what is known is not so good. Its “Visions for the future” brochure notes that it is “perceived as the organization that did not realize the European harmonization of domestic plugs and socket-outlets.”

CEN and Cenelec are non-profit organizations set up under Belgian law, developing common, agreed-upon technical practices and procedures applicable to the whole of Europe to establish a single market. Essentially, they are secretariats, coordinating the work and organizing approval. The members of both CEN and Cenelec number 19: the 15 EU member states and the Czech Republic, Iceland, Norway and Switzerland. There are a number of affiliates from central and eastern Europe, as well as links with industry chambers.

The organizational management structure and the procedure used to develop standards, as described below, are applicable to both CEN and Cenelec. (ETSI follows a different procedure to develop standards. Its work is not applicable to this report and is not covered further. See <[www.etsi.org](http://www.etsi.org)> for more information.)

CEN and Cenelec organizational structures include the following:

- Technical Board—Coordinates all technical activities, including setting up and monitoring the Technical Committees, and takes strategic decisions.
- National members—These are the 19 member countries whose representatives participate in standard development and ratification. The representatives come from the national industries, services or nongovernmental organizations and are furnished through the national standards bodies. These “national committees” are expected to present their national view to the standardization organizations. Through the national committees, CEN and Cenelec are able to tap into the expertise of thousands of persons throughout the EU.
- Technical Committees—Autonomous committees, reporting to the Technical Board, responsible for broad oversight of standards development. Within CEN there are over 270 Technical Committees (such as CEN/TC 292—Characterization of waste, and CEN/TC 264—Air quality). Cenelec has over 70 Technical Committees. Each Technical Committee takes into account any applicable international standards or other relevant work, and reviews and approves proposed standards. The EC has the right to participate in any Technical Committee.

- Associate members—These organizations provide representation of consumers, trade unions, small- and medium-sized industries, as well as the chemical industry and parts of the construction industry, among others.
- Affiliates—Central and eastern European countries who are expected to join CEN/ Cenelec as full National members in the coming years.

The funding of CEN and Cenelec comes from various sources:

- DGs, mostly DG Enterprise and DG Enlargement, and
- industry, especially for the voluntary standards, which are described below.

A manufacturer producing a good that conforms with the standards can automatically enter the EU market, via any country. Such goods have a “CE” mark on them, placed by the manufacturer and well-known to European consumers. The CE mark is not a quality guarantee—it is a market passport.

Only the health and safety harmonized standards are, in effect, compulsory—other harmonized standards are voluntary, except in a few cases where they are directly cited in directives (e.g., environmental methods of measurement). An affected party must comply with the law, but using a particular standard is not the law. Use of the standard assists to ensure compliance with the requirements of the directive, but an affected party may be able to comply with the law without applying the standard.

In any case, once a European standard has been accepted, then every member state must adopt it word for word, and withdraw conflicting standards.

Affiliate countries are encouraged to adopt the accepted standards and withdraw conflicting standards, but it may be difficult for them. During the communist era there was no distinction between regulations, directives, national laws and standards. Everything came down as an official state document with obligatory requirements. Now it is necessary for these countries to tease the nuances apart. A condition of membership in CEN/Cenelec is that 80 percent of the European standards must have been transposed as national standards—dependent, of course, on the country having differentiated laws from standards. Another difficulty for the affiliate countries is pulling together the necessary expertise and stakeholder participation.

The life of a developing standard goes through some or all of the following phases, normally taking 2 to 7 years: Initiation and development, Public enquiry, Voting, Publication.

### **Initiation and Development**

**Harmonized standards** account for approximately 25 percent of the workload. These are standards requested by the Commission under the “new approach” directives.

“Old approach” directives include all technical details of the standards directly in the regulations, so no further standardization work by CEN/Cenelec is necessary. However, this approach proved to be too burdensome on EC officials, and in 1985, the EC developed a “new approach” where the legislation only includes the desired outcome. Detailed technical specifications are then produced by CEN/Cenelec.

Products covered by the “old approach” tend to have chemical characteristics, such as chemicals, foods and pharmaceutical products. Products covered by the “new approach” tend to have physical characteristics, such as machinery, pressure equipment and personal protective equipment.

Compliance with harmonized standards provides presumption of conformity to the corresponding essential requirements of the EC directives. Manufacturers are free to choose any other technical solution that provides compliance with the requirements.

Harmonized standards are given priority for development, but much of this work is coming to an end—at this point, much of the work is maintenance-oriented (bringing a standard up to date with current technology). Often, the standard work is done by the umbrella international standards organization, ISO or IEC, described below.

The other **voluntary standards** account for approximately 75 percent of the standards produced. These are standards whose development is recommended by industry or other interested parties, via the National Committees. The proposals are also voted upon by the members. If rejected, the proposing member can create a national standard (but there is usually very little going on at the national level). If accepted:

- CEN coordinates with the International Organization for Standardization (ISO) under the “Vienna agreement.” CEN and ISO decide, on a case-by-case basis and according to precise conditions, whether to transfer the execution of European standards to ISO (and in a few cases, vice versa). Work is done according to specific ISO rules and CEN/ISO parallel procedures for public enquiry and voting. ISO standards tend to involve test methods, glossaries of terms, and sampling methods. CEN tries to adapt ISO standards as European, wherever possible. Approximately 32 percent of CEN standards are identical to ISO standards.
- A 1996 cooperation agreement (the “Dresden agreement”) between Cenelec and International Electrotechnical Commission (IEC—the international standards and conformity assessment body for electrotechnology) includes a provision for the common planning of new work. Therefore, Cenelec must notify the IEC of its intended work.

IEC is the organization that prepares and publishes international standards for all electrical, electronic and related technology, including energy production and distribution. Its membership numbers over 60 countries, including Cenelec members.

Once informed, IEC may elect to develop the standard on its own (thereby giving a standard even wider acceptance) or it may send it back to Cenelec for development. If IEC develops the standard, then, usually, Cenelec will just transpose it. Certainly, Cenelec members are interested in pushing standards of interest at a global level. IEC standards are reached by international consensus. Adoption of IEC standards by any country is entirely voluntary.

In fact, 72 percent of the input to Cenelec comes from IEC.

If a standard cannot be transposed as is, then CEN/Cenelec usually uses the Technical Committee approach. The Technical Committees convene national experts who are able to take into account the interests of affected parties, including relevant work by ISO, IEC, international or European organizations. The actual development of the standard is done by a subgroup that is especially convened and dedicated to the development of a specific standard. The Technical Committee reviews, and approves or sends back standards proposed by the subgroups. Draft standards are publicly available.

Approximately 70 percent of CEN’s work follows the Technical Committee approach, whereas 30 percent of Cenelec’s does.



## Public enquiry

Once a suitable draft has been prepared, it is submitted to all National members for review and comment, as well as to other international bodies, including the American National Standards Institute (ANSI). The public enquiry phase lasts 6 months. Comments received are reviewed and incorporated, as appropriate, before the draft is sent out for vote.

If the standard is a harmonized standard developed under the “new approach” mandate, then CEN/Cenelec involves independent consultants to evaluate the proposed standard and advise on whether the standard will help to fulfill the underlying directive. If deemed satisfactory, the formal vote is launched. In rare cases, the advice of the consultant might be not to proceed with the standard as drafted.

## Voting

The voting process usually takes 3 months. The members have weighted votes, identical to qualified majority voting, described previously: Germany, France, Italy and the UK have 10 votes each, Spain has 8, and the smaller countries have fewer votes. In order for a standard to be accepted, a majority of the National committees must vote in favor, and at least 71 percent of the expressed weighted votes must be in favor.

Prior to the formal vote, harmonized standards are once again evaluated by the independent consultant to advise on the adequacy of the standard to fulfill the underlying directive. If deemed satisfactory, the formal vote is launched. Again, very occasionally, the advice of the consultant might be not to move forward with the standard.

There is parallel IEC/Cenelec voting and parallel ISO/CEN voting on draft international standards—all standards (with few exceptions) circulated for vote in the IEC/ISO are automatically submitted for enquiry and voting at the same time as draft European standards within CEN/Cenelec. Three scenarios are likely:

- Positive votes in both the international and the European organizations.  
The Technical Board ratifies the new standard and the international organization publishes it as an international standard. The standard must be adopted by CEN/Cenelec members and conflicting standards withdrawn.
- Positive votes in the international organization, negative votes in the European organization.  
It is important to note that European standards must be adopted as national standards—but this is *not* the case for international standards. Adoption of IEC or ISO standards by any country, whether it is a member of the Commission or not, is entirely voluntary. Therefore, one can encounter the situation where a National committee casts a negative vote in CEN/Cenelec (so it is not obligatory for the member states to transpose the standard into their legislation) but a positive vote in the international organization (for a voluntary standard). In that case, the Technical Board then decides what action to take, e.g., a proposal for common modifications.
- Negative votes in the international organization.  
The draft standard is referred to the relevant technical body and the Technical Board decides what to do, e.g., they may implement the final draft international standard, or start independent European work, or submit a new proposal to the international organization.

With regard to the harmonized standards under the “new approach,” the directives provide a safeguard clause: if a member state believes that a standard is not suitable, it can re-open discussion via this clause.

There is a high, and increasing, degree of concurrence between the international standards and CEN/Cenelec standards. For example, at the end of 1997, the overall equivalence between IEC and Cenelec standards was 60 percent. But by the end of 2000, the overall equivalence had increased to 66 percent. Approximately 32 percent of CEN standards are identical to ISO standards.

### **Publication**

Once adopted, harmonized standards under the new approach are sent to the Commission so that they can be cited in the Official Journal. The Commission does not have the power to reject them unless the standard is not delivered in accordance with the original mandate. As stressed throughout this section, even though standards are not obligatory, they are very important and will have an enhanced status once cited.

All ratified and accepted standards are published and sold through the national members and affiliates. CEN and Cenelec do not publish or distribute standards.

### **Related tool**

CEN Business Operations Support System (BOSS—<http://www.cenorm.be/boss/>). This internet-based system describes all CEN processes and documents them, including a directory of the roles and responsibilities of all parties involved in European standardization. It has detailed information on the key processes and structures in the CEN operations, at both strategic and operational levels.

### **Trends**

Both CEN and Cenelec expect to see their roles in the service industry increase. CEN considers itself to be in a bit of a transitional phase—as requests for work on harmonized standards are decreasing, it is responding more and more to requests for work in the service sector: call centers, language schools, as well as civil defense procurement. Cenelec envisions standardization in the electrotechnical sector to become more complex as electrotechnology products are incorporated into more and more products and the product lifecycles and innovation periods are shortened.

### **KEY POINTS**

- CEN handles most of the relevant environmental issues. Electricity generation issues are handled by IEC. Cenelec handles some tangentially related issues.
- European standards are voluntarily applied with few exceptions, including environmental methods of measurement.
- The standards are performance-oriented, with verifiable criteria.
- The committees that develop the standards make decisions by consensus.
- European standards organizations have agreements with international organizations (ISO and IEC, among others) to avoid duplication and efficiently use their resources.
- National standards bodies voluntarily “standstill” while work is ongoing at international level.
- The standards are *prepared on the basis of consensus* between all the interested parties, but *the formal acceptance of the standards is decided by weighted voting of the members and is binding on all of them*. Once a standard is accepted, all members must accept the results (even if they voted against the standard) and withdraw any conflicting national standards.

**European Committee for Electrotechnical Standardization (Cenelec)**

36, rue de Stassart  
B-1050 Brussels, Belgium  
<http://www.cenelec.org>  
322-519-6871  
322-519-6919 (fax)  
Paco Cabeza-Lopez, Info and Publications  
322-519-6919  
[info\\_pub@cenelec.org](mailto:info_pub@cenelec.org)

**International Electrotechnical Commission (IEC)**

3, rue de Varembe  
P.O. Box 131  
CH - 1211 Geneva 20, Switzerland  
4122-919-0211  
4122- 919-0300 (fax)  
<http://www.iec.ch>  
[info@iec.ch](mailto:info@iec.ch)

**European Committee for Standardization (CEN)**

36, rue de Stassart  
B-1050 Brussels, Belgium  
322-550-0811  
322-550-08 19 (fax)  
<http://www.cenorm.be/>  
[infodesk@cenorm.be](mailto:infodesk@cenorm.be)  
Stewart Sanson, Public Relations Manager  
322-550-0852  
[stewart.sanson@cenorm.be](mailto:stewart.sanson@cenorm.be)

**American National Standards Institute (ANSI)**

1819 L Street, NW  
Washington, DC 20036  
202-293-8020  
202-293-9287 (fax)  
Gary W. Kushnier, Vice President of  
International Policy  
202-331-3604  
[gkushnie@ansi.org](mailto:gkushnie@ansi.org)

## **EUROPEAN ORGANIZATIONS INVOLVED IN ELECTRICITY ISSUES**

### **Eurelectric**

Bd. De l'Impératrice 66  
B-1000 Brussels, Belgium  
322-515-1000  
322-515-1010 (fax)  
contact: John Scowcroft  
322-515-1041  
<http://www.eurelectric.org>, <http://www.gets2.org>  
[jscowcroft@eurelectric.org](mailto:jscowcroft@eurelectric.org)

Eurelectric is the principal European electricity industrial chamber organization. It is the foremost authority and contact for issues facing the EC. Its mission is “to contribute to the development and competitiveness of the electricity industry and to promote the role of electricity in the advancement of society.” The work is twofold: focusing on members’ needs and responding to those, and also, representing the electricity industry within the European Union to promote the interests of the members.

In March 2001, several representatives of Eurelectric, along with a representative from DG Tren, went on a joint mission to the US to meet with some of the “most representative entities directly involved in the liberalization process of the US electricity sector” to report on the California electricity sector crisis.

Eurelectric, in conjunction with Environmental Resources Management (ERM), has spearheaded three tradings simulations: the Greenhouse Gas and Energy Trading Simulations (GETS 3). Results from the third exercise are favorable, and Eurelectric has encouraged the expansion of the trial to include many sectors, entities and substances.

### **Eurogas**

Av. Pamerston 4 (Hotel Van Eetvelde)  
B-1000 Brussels, Belgium  
322-237-1111  
322-230-6291  
<http://www.eurogas.org>  
[eurogas@eurogas.org](mailto:eurogas@eurogas.org)

Eurogas is a non-profit international association, promoting gas industry cooperation and representing the European natural gas industry to the European Union and other interested organizations. It is active in monitoring policy developments and presenting views on matters of its interest, especially to the EC, Parliament and Economic and Social Committees. At times, it works with the International Energy Agency (IEA, described below) and the UN-ECE Energy Division Working Party.

Eurogas shares its Secretariat with the Technical Association of the European Natural Gas Industry (Marcogaz), focusing on technical regulations and standards in the fields of gas supply and utilization, gas-fired equipment) and with the European Gas Research Group (GERG—focusing on sharing R & D strategies and programs among gas supply companies).

Its web site features a good deal of basic information on gas usage, including definitions and statistics, broken out by country.

**International Council on Large Electric Systems (CIGRE)**

Jean Kowal, Secretary General  
21, rue d'Artois  
75 008 Paris, France  
331-538-912-90  
331-538-912-99 (fax)  
Paris, France  
<http://www.cigre.org>  
[jean.kowal@cigre.org](mailto:jean.kowal@cigre.org)

CIGRE is an NGO, founded in 1921, that facilitates and develops the exchange of engineering information between engineering personnel and technical specialists in all countries. It particularly focuses on technical issues such as the planning and operation of power systems. It is not involved in lobbying activities. It has a bilingual, bimonthly journal, distributed only to members, that publishes the results of its technical study committees.

**Concawe**

Bldv. du Souverain 165  
B-1160 Brussels, Belgium  
322-566-9160  
322-566-9181 (fax)  
email: [info@concawe.be](mailto:info@concawe.be)  
<http://www.concawe.be>

Concawe is the oil companies' European organization for environment, health and safety. Established in 1963, it primarily works on technical and economic studies relevant to oil refining, distribution and marketing in Europe. Its publication "Concawe Review," published on its web site, provides a summary of the latest initiatives to affect the industry.

**International Energy Agency (IEA)**

9 rue de la Fédération  
75739 Paris Cedex 15  
France  
Tel: (+33)1 40 57 65 51  
Fax: (+33) 1 40 57 65 59  
<http://www.iea.org>  
[info@iea.org](mailto:info@iea.org)

Founded in 1974 and based in Paris, the IEA is an autonomous agency linked with the OECD. It is the energy forum for 26 member countries, who are committed to taking joint measures to meet oil supply emergencies—sharing energy information, coordinating energy policies and cooperating in the field of rational energy programs

It is the authoritative source for energy statistics, providing its members and the public with information and analyses. It reports regularly on the energy policies of its member states and selected non-member states. Publications include the monthly *Oil Market Report* and the biannual *World Energy Outlook*.

Its on-line database is divided into two parts:

- Government energy technology research and development budgets—data on conservation, fossil fuels, renewable energy, nuclear fission, power and storage technologies are available.

- Economic indicators—available in three series.

Publications detailing the energy policies of IEA countries, as well as individual studies on The Netherlands, France, Luxembourg, Portugal, Canada and Sweden are available for costs ranging from \$US 75 to \$US 120.

It is also involved in issues such as security of supply, energy policy and regulatory reform in non-OECD countries, energy efficiency and technology in non-OECD countries.

**Centre for European Policy Studies (CEPS)**

1 Place due Congres  
1000 Brussels, Belgium  
322-229-3911  
322-219-4151 (fax)  
<http://www.ceps.be>  
[info@ceps.be](mailto:info@ceps.be)

CEPS is one of the foremost European policy think tanks. Its mission is to “produce sound policy research leading to constructive solutions to the challenges facing Europe.” It is an independent, not-for-profit research institute, setting its own priorities and free from outside influence. It accepts funding from the public and private sectors on the condition that contributors will not interfere in the development, outcome or publication of the research.

Its work is organized under two major areas: Economic Policy and Politics, and Institutions and Security.

One of its working parties is concerned with EU policy options to improve the security of the energy supply. The impetus for the initiation of the working party included the trend towards growing energy dependence, perceived failure of energy efficiency and conservation measures, and volatile world energy markets.

## EUROPEAN COMMISSION PROGRAMS

### **Clean Air for Europe (CAFE—DG Environment)**

<http://europa.eu.int/comm/environment/air/currentstate.htm>

CAFE is a program of technical analysis and policy development, launched in March 2001, with a 5-year policy cycle. Meeting 2–3 times per year, its aim is to develop a long-term, strategic and integrated policy to protect against the effects of air pollution on human health and the environment. Representatives from the electricity-generating sector participate in this program. The CAFE program includes the following objectives:

- to develop, collect and validate scientific information relating to the effects of air pollution, emission inventories, air quality assessments and projections, cost-effectiveness studies and assessment modeling, in order to develop and update objectives and indicators needed to reduce emissions,
- to support the implementation and review the effectiveness of existing legislation, including air quality and NEC directives,
- to ensure that sectoral measures needed to achieve air quality objectives are taken at the appropriate level through the development of effective structural links with sectoral policies,
- to determine an overall, integrated strategy periodically which defines appropriate objectives and cost-effective measures, and
- to disseminate program information.

### **ETAP (DG-Tren)**

Contact: Maria Ibarra

322-295-4507

[maria.ibarra-gil@cec.eu.int](mailto:maria.ibarra-gil@cec.eu.int)

[http://europa.eu.int/comm/energy/en/pfs\\_etap\\_en.html](http://europa.eu.int/comm/energy/en/pfs_etap_en.html)

Under the aegis of DG-Tren, ETAP is a multi-annual program of studies, analyses, forecasts and other related work in the energy sector. The primary focus of the program includes:

- security of supply,
- competitiveness, and
- environmental protection.

Much of the work of ETAP touches on standardization and normalization efforts, including efforts to:

- establish a shared approach in Europe to studies, analyses, forecasts and other related work in the energy sector,
- promote coordinated analyses of energy trends in Europe and in the world,
- analyze and evaluate the impact of energy production and use on the environment, including in relation to climate change,
- help identify and transfer the best analysis methods and practices,
- facilitate information networks in the energy fields, and
- facilitate methodologies for monitoring the implementation of the energy framework program.

Once per year the member states discuss, and decide on, a list of proposed projects. Generally, the fruits of these projects feed into other projects throughout the European Union.

The program runs through 1998–2002 and the total budget is € 5 million (\$US 4.5 million). The budget for 2001 is € 500,000 (\$US 450,000). Although there are no immediate plans to continue the project, interest is high. The program is open to all the member states and the Central and Eastern European countries, and Cyprus. At this point, there are no North American companies partnered within the projects.

### **Synergy (DG-Tren)**

Directorate C-Unit C1

Contact: Johannes Maters

Rue de Mot 24-26

B-1040 Brussels

Lars-hyden@cec.eu.int

Josep.casanovas@cec.eu.int

Synergy is the international cooperation component of the “Energy Framework Programme” which runs from 1998 to 2002, and is managed by the Directorate-General for Energy and Transport (DG-Tren). The program finances cooperation with non-EU countries in the formulation and implementation of energy policy “to the mutual benefit of all concerned.” The stated objectives of the program include:

- improve the competitiveness of Community industries,
- enhance the security of supply,
- promote sustainable development, and
- improve energy efficiency.

The program implementation has recently been refocused on activities related to security of supply and Kyoto protocol implementation.

It provides advice and training, analysis and forecasting, and promote closer dialogue and information exchanges. Projects financed include a number of conferences and studies involving Central and Eastern Europe, China and Latin America.

### **Altener II (DG-Tren)**

<http://europa.eu.int/comm/energy/en/altener2.htm>

This is the only EC program to focus exclusively on the promotion of renewable energy sources, especially wind energy, solar energy, small-scale hydro power and energy from biomass (which are known to be economically viable), geothermal energy and other, unnamed renewable energy sources that are approaching viability. It is the continuation of a previous project, Altener. This time around the project is beefed up and will run until December 2002. A follow-up project is expected.

The total program budget is € 17.5 million. For 2001, the average project received € 300 thousand. From initial proposal to acceptance normally takes 5–6 months, and then a few months for contracting.

In brief, the program objectives include:

- implement EC measures to develop renewable energy potential,



- encourage harmonization of products and equipment in the renewable energy market, and
- support infrastructure that will increase investor confidence.

There is emphasis on information dissemination activities, support for targeted actions to speed up investment, and assessment of progress in the adoption of renewable energy technologies. The program description on the Internet implies that this program encourages regional projects with a focus on Cyprus, and Central and Eastern Europe.

Part of the project includes the development of a virtual information center on the web: *Agores*, which is an official web site of DG-Tren, dedicated to renewables.

### **Carnot (DG-Tren)**

Contact: Utz Oppermann

Rue de Mot 24-26

B-1040 Brussels

Fax: 322-296-5801

carnot@cec.eu.int

<http://europa.eu.int/comm/energy/en/carsum.htm>

Carnot is a five-year program (1998–2002) whose objective is to promote the environmentally sound use of solid fuels and present them as a reliable, readily available, competitive and environmentally compatible energy source. All aspects are included—everything from coal processing to handling, storage, and transport facilities, burning or conversion plants, including waste disposal. The total amount available is € 3 million (\$US 2.7 million), and the program is open to “technology actors in the solid fuels chain,” including consultants, equipment manufacturers and industry chambers.

There are two types of projects that are funded by this program: measures to foster cooperation aimed at improving information exchange between national, Community and international entities; and measures to foster industrial strategic cooperation, such as business workshops and seminars.

### **ExternE (DG Research)**

Contact: Pierre Valette

200 Rue de la Loi

B-1049 Brussels

Tel: 322-295-6356

Fax: 322-299-4991

<http://externe.jrc.es/overview.html>

[pierre.valette@cec.eu.int](mailto:pierre.valette@cec.eu.int)

The ExternE project, a research project of the EC, assesses the environmental and social damages associated with energy use. These are the costs imposed on society that are not accounted for by the producers and consumers of the energy—and therefore, costs that are not included in the market price.

The project was launched jointly with the US Department of Energy in 1991. Now deep into the third phase of the project, the EC has continued the work under the Joule II program. The methodology developed is currently being applied to a wide range of different fossil, nuclear and renewable fuel cycles for power generation and energy conservation options.

A recent report from the study concluded that if damage to the environment and health were included in the price of electricity generated by coal and oil, their costs would double, and the cost of electricity production from gas would increase by 30 percent. The research team also found that nuclear power results in relatively low external costs due to its low influence on global warming and

its low probability of accidents in EU power plants. Wind and hydro electricity generate the lowest external costs.

Without including global warming, environmental and health costs attributable to fossil fuel combustion amount up to 1–2 percent of the EU's gross domestic product and are not included in the bills paid by electricity customers.

The report examines two ways in which authorities can take account of damage from fossil fuels:

- Tax damaging fuels and technologies in order to substantially raise the price of electricity generated by them. For example, the price of coal would need to rise by between two and eight cents per kWh in order to reflect their true cost. However, taxation at the EU level is difficult to achieve, rendering this option unviable.
- Encourage or subsidize cleaner technologies that allow customers to avoid health or environmental costs. This is the preferred option, and in February of this year, the EC published community guidelines on state aid for environmental protection, stating that subsidies should be calculated on the basis of the external costs avoided, resulting in a maximum subsidy of five cents per kWh.

The researchers believe that the system could also be used to calculate the real costs of other energy-related sectors, such as transport. A follow-up study has begun to study additional external costs, such as mortality, acidification and eutrophication, major accidents from non-nuclear fuel, such as from oil spills, and the effects caused by the environment being damaged.

## **Sure**

DG-Tren

[http://europa.eu.int/comm/energy/en/pfs\\_sure\\_en.html](http://europa.eu.int/comm/energy/en/pfs_sure_en.html)

The Sure program is specifically for the nuclear sector and targets three areas:

- transport of radioactive materials: problems of safety, health protection and nuclear safety techniques,
- industrial cooperation with the countries participating in the Tacis program<sup>12</sup>, and
- safeguards in countries participating in the Tacis program.

---

<sup>12</sup> The Tacis program is one of the key instruments of the EU to develop cooperation with the 13 countries of the Newly Independent States and Mongolia. Development of human resources is a top priority in each of these countries, with particular emphasis on financial and administrative skills, as well as the agriculture and energy sectors. <[http://europa.eu.int/comm/external\\_relations/index.htm](http://europa.eu.int/comm/external_relations/index.htm)>

## TRENDS

### Compliance

Compliance statistics show that during the year 2000, noncompliance in the environmental sector continued to increase. The Commission brought 39 cases against member states and delivered 122 reasoned opinions or supplementary reasoned opinions.

Based on reports provided by the member states, the Commission may propose a directive in 2003 on minimum criteria, including peer review, for qualifications for inspectors and training programs.

Also, in February 2000, the Commission adopted a White Paper on environmental liability. The objective of the paper is to explore various ways in which an EC-wide environmental liability regime could be shaped. The White Paper concludes that the most appropriate form of action would be an EC Framework Directive on Environmental Liability.

The Commission also must assure that member states' legislation conforms with the requirements of the environmental directives, and that the Community environmental law is properly applied. There have been some improvements in connection with transposition of Community provisions into matching national legislation. Complaints and petitions sent to the European Parliament by individuals and NGOs generally relate to incorrect application of the law.

The number of complaints continued to rise in 2000:

Year	Number of complaints
1998	432
1999	453
2000	543

The countries most often involved were Spain, France, Italy and Germany.

Among the most common issues raised by complaints are refusals by national authorities to provide requested information, slowness of response, excessively broad interpretation by national government departments of exceptions to the principle of disclosure, and unreasonably high charges.<sup>13</sup>

Issue	Percentage of complaints that raise issue, year 2000
Nature conservation	33 %
Environmental impact	25 %
Waste-related	17 %
Water pollution	10 %

*Note: Complaints often raise more than one issue.*

### Electricity generation

As stated earlier, a recent *Financial Times Energy* study concluded that Europe would need 69,000 MW of new generating capacity through 2005. *FT Energy* also notes that high electricity prices and monopoly conditions in Europe precipitated the internal energy market directives. To date, over 60 percent of the market has been liberalized but market conditions are still disjointed. Although member states were obliged to transpose the electricity and gas internal market directives into law by 1999 and 2000 respectively, they were given freedom on how to implement them. Therefore, there are 15

---

<sup>13</sup> The relevant Council Directive is 90/313/EEC on the freedom of access to information on the environment.

different types of market opening and regulatory frameworks. Industry officials sigh that the market is composed of a juxtaposition of national markets, as opposed to one continental market.

Progress towards a full single market is stalled. Some countries, such as the UK, Germany and the Nordic countries, are regarded as relatively open; while France is regarded as relatively closed. The French company, *Électricité de France* (EDF), is widely regarded as a predator—since it depends on cheap nuclear power, foreign companies are unable to compete on price. And EDF has been on a buying spree throughout Europe, to the annoyance of other European energy companies.

On 25 July 2001, the EC proposed an extension to its coal industry subsidy program that would take it to roughly 2005, in an effort to cut Europe's dependence on outside sources for energy. After that point, it will be less economical to invest in coal-fired plants. But even though coal-fired generation comes with pollution problems, it is considered a low-cost form of electricity generation. Some countries are exploring clean-coal technologies but it is unknown how much this will contribute to overall demand. At this point, 80 percent of European reserves are coal.

Renewable energy sources (RESs) in the EU are receiving much support, including a recent directive intended to boost their use throughout the EU. Wind power is popular in Europe, and according to the US Department of Energy (US DOE), it is expected to grow by 1.9 percent / year. Some critics have noted that it would take nearly 2000 wind turbines to equal one nuclear plant and say that Europe's move towards RESs is unrealistic. Other critics are even more pessimistic, saying that the EU will not meet its RES targets, and even if it did, it wouldn't matter too much.

The government of Germany has accepted an industry pledge to expand the use of cogeneration technology in order to reduce carbon dioxide emissions—promising to cut their carbon dioxide emission by a total of 45 million tons a year by 2010. Higher production in CHP plants will enable reductions of 20 to 23 million tons. As part of the proposal, network operators will be required to purchase the CHP electricity at above-market rates. The industry proposal prevents legislation that would have forced the utilities to produce a fixed percentage of electricity in CHP plants.

In June 2001, Germany's government and four major utilities finalized an agreement that will shutdown the country's 19 nuclear power plants over the next several decades. The utilities were not especially pleased with the agreement, but chose to accept it since the government agreed to allow the utilities to use the existing nuclear plants for the remainder of their useful lives. The normal lifespan of a nuclear plant is 32 years. As the youngest plant started producing electricity in 1989, it is expected to go offline in 2021.

As one industry representative pointed out, the facilities agreed to let the nuclear plants continue operation for a lifespan of 35 years at 80 percent capacity—effectively, 40-plus years.

Recently, Germany's two largest power producers, RWE and E.ON, cut output from their nuclear plants in reaction to the price squeeze that has developed due to market liberalization—approximately a 10 percent cut in Germany's overall power generating capacity.

Belgium's energy comes from roughly 40 percent nuclear sources; it is unclear what will happen when these facilities go off-line. There is no political will to build new nuclear facilities. Hydro power is used to its best capacity; wind and sun are not consistently dependable.

Also in June 2001, British utilities proposed their largest expansion of nuclear power stations in the United Kingdom after a shift in the ruling Labor Party's position. Although there had been a 1997 pledge to block new plant construction, in May 2001, the Labor Party published a manifesto including the statement: "Coal and nuclear energy currently play important roles in ensuring diversity in our sources of electricity generation." The manifesto also notes that the government is "examining the scope for turning the company (British Nuclear Fuels Ltd.) into a public-private partnership." The

Conservative Party manifesto was at least tepid: “We will review the future of nuclear energy and its role in contributing to reductions in CO<sub>2</sub> emissions.” The United Kingdom currently has 33 reactors that provide approximately 25 percent of their electricity.

The European Union has requested that Lithuania commit to closing down the Ignalina nuclear power plant’s second reactor by 2009. Lithuania has received financial commitments from EU countries to help pay for the decommissioning. However, the amount pledged is only 20 percent of the amount needed (€ 200 million, out of € 1 billion); and the plant produces 73 percent of the country’s electricity supply. Lithuania wants in to the EU, but some EU members are reluctant to offer membership with an operating Ignalina—it uses Chernobyl technology and is physically quite close to several EU states. Lithuania intends to complete a new national energy plan in 2004 and address the issue at that time.

But how could additional capacity be developed? Nuclear power is touchy, coal is not considered clean, RESs may be unable to provide the amount of energy needed. Natural gas is emerging as the choice.

In a recent mid-September 2001 *European Voice* interview, François Lamoureux, the Director-General for Energy, said there are two main challenges for EU energy policy in the face of enlargement: closure of nuclear power stations and nuclear safety. He also noted that “climate change may force us to revise of our preconceptions” about nuclear energy, since the savings in CO<sub>2</sub> emissions is so high.

### **Emissions trading**

A Green Paper on greenhouse gas emissions trading within the European Union, COM (2000)87, states an intention to start a limited emissions trading scheme by 2005, beginning with carbon dioxide. An international system is anticipated for 2008. A draft proposal by DG Environment on emissions trading has been blocked within internal consultation procedures.

Utilities are bracing for emissions trading. Eurelectric, in conjunction with ERM, has spearheaded three tradings simulations: the Greenhouse Gas and Energy Trading Simulations (GETS 3). Early results from the third exercise are favorable, and Eurelectric has encouraged the expansion of the trial to include many sectors, entities and substances.

## REFERENCES

**Council Directive 96/92/EC: Concerning common rules for the internal market in electricity**  
[http://europa.eu.int/eur-lex/en/lif/dat/1996/en\\_396L0092.html](http://europa.eu.int/eur-lex/en/lif/dat/1996/en_396L0092.html)

**Directive 98/30/EC: Concerning common rules for the internal market in natural gas**  
[http://europa.eu.int/eur-lex/en/lif/dat/1998/en\\_398L0030.html](http://europa.eu.int/eur-lex/en/lif/dat/1998/en_398L0030.html)

**Directive on the promotion of electricity from renewable energy sources in the internal electricity market**  
[http://europa.eu.int/eur-lex/en/com/dat/2000/en\\_500PC0279.html](http://europa.eu.int/eur-lex/en/com/dat/2000/en_500PC0279.html)

**Resolution on a Community strategy to promote combined heat and power**  
[http://europa.eu.int/eur-lex/en/lif/dat/1998/en\\_398Y0108\\_01.html](http://europa.eu.int/eur-lex/en/lif/dat/1998/en_398Y0108_01.html)

**Directive 97/11/EC amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment**  
[http://europa.eu.int/eur-lex/en/lif/dat/1997/en\\_397L0011.html](http://europa.eu.int/eur-lex/en/lif/dat/1997/en_397L0011.html)

**Directive 2001/42/EC: Strategic Environmental Assessment**  
[http://europa.eu.int/eur-lex/en/dat/2001/l\\_197/l\\_19720010721en00300037.pdf](http://europa.eu.int/eur-lex/en/dat/2001/l_197/l_19720010721en00300037.pdf)

**Directive 96/61/EC: Concerning integrated pollution prevention and control (IPPC)**  
[http://europa.eu.int/eur-lex/en/lif/dat/1996/en\\_396L0061.html](http://europa.eu.int/eur-lex/en/lif/dat/1996/en_396L0061.html)  
<http://europa.eu.int/comm/environment/ippc/>

**Directive 1999/32/EC relating to a reduction in the sulphur content of certain liquid fuels and amending Directive 93/12/EEC**  
[http://europa.eu.int/eur-lex/en/lif/dat/1999/en\\_399L0032.html](http://europa.eu.int/eur-lex/en/lif/dat/1999/en_399L0032.html)

**Directive on air quality**  
[http://europa.eu.int/eur-lex/en/lif/dat/1996/en\\_396L0062.html](http://europa.eu.int/eur-lex/en/lif/dat/1996/en_396L0062.html)

**Council Decision establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within member states**  
[http://europa.eu.int/eur-lex/en/lif/dat/1997/en\\_397D0101.html](http://europa.eu.int/eur-lex/en/lif/dat/1997/en_397D0101.html)

**IPPC Directive**  
[http://europa.eu.int/eur-lex/en/lif/dat/1996/en\\_396L0061.html](http://europa.eu.int/eur-lex/en/lif/dat/1996/en_396L0061.html)

**EPER Decision**  
[http://europa.eu.int/eur-lex/en/lif/dat/2000/en\\_300D0479.html](http://europa.eu.int/eur-lex/en/lif/dat/2000/en_300D0479.html)

**Council Directive 84/360/EEC of 28 June 1984 on the combating of air pollution from industrial plants**  
[http://europa.eu.int/eur-lex/en/lif/dat/1984/en\\_384L0360.html](http://europa.eu.int/eur-lex/en/lif/dat/1984/en_384L0360.html)

**Green Paper on greenhouse gas emissions trading within the European Union**  
[http://europa.eu.int/environment/docum/0087\\_en.htm](http://europa.eu.int/environment/docum/0087_en.htm)

**Green Paper on the European strategy for security of energy supply**  
[http://europa.eu.int/comm/energy\\_transport/en/lpi\\_lv\\_en1.html](http://europa.eu.int/comm/energy_transport/en/lpi_lv_en1.html)

**White Paper on the strategy for a future chemical policy**

[http://europa.eu.int/eur-lex/en/com/wpr/2001/com2001\\_0088en01.pdf](http://europa.eu.int/eur-lex/en/com/wpr/2001/com2001_0088en01.pdf)

**White Paper on environmental liability**

[http://europa.eu.int/eur-lex/en/com/wpr/2000/com2000\\_0066en01.pdf](http://europa.eu.int/eur-lex/en/com/wpr/2000/com2000_0066en01.pdf)

**White Paper on an energy policy for the European Union COM(95) 682, December 1995 (not available on-line)**

<http://europa.eu.int/comm/environment/>

<http://europa.eu.int/comm/energy/en/>

[http://europa.eu.int/comm/off/white/index\\_en.htm](http://europa.eu.int/comm/off/white/index_en.htm)

<http://europa.eu.int/comm/enterprise/newapproach/standardization/introduc.html>

The European Centre for European Policy Studies—<http://www.ceps.be>

*Financial Times Energy*—[http://www.ftenergy.com/press/pdfs/RDI/PM\\_Europe%20II.doc.pdf](http://www.ftenergy.com/press/pdfs/RDI/PM_Europe%20II.doc.pdf)

CEN, *Annual Report 1999–2000*

CEN, *Responding to Changing Needs*

CEN, *Harmonization in the Single European Market, Directives and related standards* (ISBN 92-9097-828-7)

Cenelec, *Visions Until 2010*

Cenelec, *Facts & Figures 2000*

Cenelec, *Annual Report 2000*

The European Parliament ISBN 92-823-1142-2

The Council of the European Union, BX-03-97-814-EN-C

<http://www.gasandoil.com>

<http://www.icbi-uk.com/mr-elec.htm>

*International Environment Reporter*, volume 24, number 19, page 771

*International Environment Reporter*, volume 24, number 12, page 467

*International Environment Reporter*, volume 24, number 13, page 508

*International Environment Reporter*, volume 24, number 14, page 551

*International Environment Reporter*, volume 24, number 09, page 323

*International Environment Reporter*, volume 24, number 07, page 236

*International Environment Reporter*, volume 24, number 05, page 180

*International Environment Reporter*, volume 24, number 01, page 9

*International Environment Reporter*, volume 23, number 25, page 943

*International Environment Reporter*, volume 23, number 22, page 830

*International Environment Reporter*, volume 23, number 14, page 521

*European Voice*, 20–26 September 2001, pages 17–22.

*The Government and Politics of the European Union*, N. Nugent, et. al., 4<sup>th</sup> Edition, 1999.

Edie weekly summaries: 14/09/2001 (<http://www.edie.net/news>)

*Guidance Document for EPER implementation*, 2000, ISBN 92-894-0279-2

<http://europa.eu.int/scadplus/leg/en/lvb/131016.htm> (Taxation of energy products)

<http://professional.electrabel.be>

*Environment for Europeans*, May 2001.

*Serving the European Union—A Citizen's Guide to the Institutions of the European Union*, 2nd ed., Luxembourg, OPOCE, 1999

## ACRONYMS AND DEFINITIONS

American National Standards Institute	ANSI
Biological oxygen demand	BOD
Best available techniques reference document	Bref
European Committee for Standardization	CEN
European Committee for Electrotechnical Standardization	Cenelec
Centre for European Policy Studies	CEPS
Combined heat and power (cogeneration)	CHP
International Council on Large Electric Systems	CIGRE
Chemical oxygen demand	COD
Central countries	Czech Republic, Hungary, Poland, Slovakia
Directorate-General for Energy and Transport	DG Tren
EFTA countries	Norway, Switzerland, Iceland and Liechtenstein
European Commission	EC
European Environment Agency	EEA
Eco-management and auditing scheme	EMAS
European Telecommunications Standards Institute	ETSI
European Union	EU
International Energy Agency	IEA
Integrated pollution prevention and control	IPPC
Large combustion plant	LCP
Megawatts (power demand)	MW
National emissions ceilings	NEC
Organization for Economic Cooperation and Development	OECD
Particulate matter	PM
Persistent organic pollutant	POP
Renewable energy source	RES
Volatile organic compound	VOC