European Union Environmental Legislation

1. INTRODUCTION

1.1 Basis of European Union Legislation

The legislation of the European Union consists of documents on basically four levels. The *Treaty* of the Union functions as a constitution of a state. It is an over-all legal base for all other documents. The *Declarations* are policy documents with indicate a direction but does not have binding status. The *Programmes*, such as the EAPs, are policy documents and not binding. They have, however, considerable influence on the process of legislation since they provide principles and directions.

Finally there are the *Directives* and *Regulations*. A regulation becomes immediately enforceable as law in all member states simultaneously. The directives, the most common type of EU legislation in the field of environment, on the other hand, are implemented nationally. The general clause Art 189 EEC says that

"A directive shall be binding as to the results to be achieved upon each member state to which it is addressed, but shall leave to the national authorities to choice of form and methods."

Directives are referred to by their official numbers, for instance 70/229/EEC. The first number refers to the year in which the directive was adopted (1970 in this case); the second number is a serial number. The addition EEC indicates that the directive was legally based on the EEC treaty.

Sources for this section
The text in this section is a based on the European Union Commission Directorate General for Environment website http://ec.europa.eu/environment/index_sv.htm. A review of the EU activities in the field of environment, including legislation, is found on http://europa.eu/pol/env/index_en.htm. All legally valid document (directives, regulations, etc., and their amendments) are found as pdf documents on http://eur-lex.europa.eu/en/repert/1510.htm. The same texts in other EU languages than English are also available on these sites.

The number of directives related to environmental issues is large and increasing. The European Commission develops directives with considerable input from member states and the European parliament. Once adopted by the Council of Ministers, the member states are solely responsible for the implementation of the requirements of the directive. However, there is some time before the implementation is to be complete.

Directives develop over time. New regulations are added or *amended* to them. The amendments may be published as *Decisions* or *Communications* of the Commission. If many changes were made the Directive may be *codified* by the Commission into a new text, without any policy or legal changes. They then get a new designation – year and number. As new Directives are developed to substitute older legislation, the former texts are *appealed* by the new ones, and thus not any more valid.

1.2 Development of the Directives

The first legislation dealing with an environmental issue was a Euroatom directive from 1959 and the two directives on vehicle emissions and noise from 1970 and 1972. But it was not until after the second Environmental Action Programme in 1977 that a number of directives with more far-going ambitions were adopted. These included legislation on water quality, air quality (directive on limits to SO_2 and particulates, as well as a directive on lead concentration in the air), waste handling, labelling and packaging of dangerous substances, as well as regulating discharge of dangerous substances into surface waters.

These directives were largely a static set of regulations, focusing on setting discharge and concentration limits and the absolute reduction of ambient environmental impact and level of pollution. All these concerns and areas have since been pursued in much more forceful regulations.

The first steps to create more dynamic and pro-active instruments of regulation came with the introduction of the BAT notion in relation to the cleaning of wastewater. BAT is Best Available Technology, later changed to Best Available Techniques. It was at that stage referring to dangerous or hazardous substances in wastewater before being discharged into surface waters and in a separate directive, the same regulation in relation to discharge to ground water. The Best Available (Cleaning) Technology is still used as a reference for the end-of-pipe emission limit values, as a BAT type production equipment and management is required to get an IPPC-licence.

1.3 Framework Directives

Still later even more comprehensive and far-going pieces of legislation took the form of Framework directives (Box 1). A framework directive constitutes a general frame for legislation in an area and requires a set of national decisions to define limits, and rules of adoption etc. The first framework directive was the one on water. This directive is based on a considerable amount of research and was put forward as a set of principles to protect water in the Union. It is not surprising that water protection was the first area to be developed in some detail. Water, after all, flows freely from one country to the next and downstreamers may suffer very badly from sins committed by the upstreamers. International regulation is well justified. To framework directives are added daughter directives or other pieces of legislation, regulating specific issues.

Box 1 Framework Directives

Framework directives or corresponding integrating regulations of whole areas exist in the following areas:

- Integrated Pollution Prevention and Control in Industries, IPPC (Directive 96/61/EC).
- Air Quality Framework Directive (Directive 96/62/EC) on ambient air quality assessment and management.
- Water Framework Directive on integrated river basin management (Directive 2000/60/EC).
- Waste Framework Directive (Directive 2006/12/EC).
- A Regulatory framework (Regulation) for the Registration, Evaluation and Authorisation of Chemicals (REACH) from December 2006.
- A Soil Framework Directive for the protection of soil was proposed (COM(2006) 232) by the Commission in 2006.

1.4 Strategies and Policies

The Sixth Environment Action Programme represented a step in the direction of integrated environmental policies. One of the initiatives in the EAP was the development of thematic strategies covering seven areas, all of them prepared in 2005 and 2006. The areas are

- Air Pollution (adopted 21/09/2005)
- Prevention and Recycling of Waste (adopted 21/12/2005)
- Protection and Conservation of the Marine Environment (adopted 24/10/2005)
- Sustainable Use of Pesticides (adopted 12/07/2006)
- Soil (adopted 22/09/2006)
- Sustainable Use of Resources (adopted 21/12/2005)
- Urban Environment (adopted 11/01/2006)

The Thematic Strategies represent the next generation of environment policy. As their name suggests, they work with themes rather than with specific pollutants or economic activities, as has been the case in the past. They take a longer-term perspective in setting clear environmental objectives to around 2020 and will thus provide a stable policy framework.

Finally, they focus on identifying the most appropriate instruments to deliver European policy goals in the least burdensome and most cost-effective way possible. Legislation is one such instrument; others are economic support, research, and stakeholder agreements etc.

1.5 Incorporation into National Legislation

The directives need to be incorporated into national legislation to enter into force. This may in some cases be trivial in the sense that a country already practises laws, which conform to the directive or are more advanced than the directive. Then no action is needed. But as EU legislation develops, more and more of the directives need to be translated into national law. This should be done within a given time limit, which is part of the decision of the directive.

From this point of view the European Legislation is not relevant, only the national one. But the European environmental legislation gives a hint on what exists in the national legislation; it is a common minimum requirement. The national environmental legislation, the *Environmental Code* of the country, is what counts, but the European legislation gives a picture of what it includes.

It should be added that the development of EU legislation includes a considerable amount of stakeholder consultation, of questionnaires in which every EU citizen can take part, and of specialists reports from the countries. Legislation should thus be well prepared in Member States and is expected to be acceptable both in content and the conditions for implementation. In most cases they also have been accepted by consensus in the Council of Ministers.

In most cases the environmental directives defines minimum conditions for environmental management in an area. The Member States may use more stringent conditions.

1.6 Legal Follow-up

It is the Commission's responsibility to ensure that Community law is implemented and applied correctly by the 27 Member States of the Union. There are a number of ways in which the Commission monitors this. First of all it undertakes its own studies and assessments. Secondly the Commission investigates complaints from EU citizens, petitions from the European Parliament, and questions from Members of the European Parliament (MEPs). The Commission also scrutinize reports submitted by Member States themselves (there is an obligation to report under the environmental directives), to see if there is a violation of Community environment law.

There are three categories of *breaches* of Community law. Firstly, "non-communication" cases, where a Member State has failed to adopt and communicate to the Commission national legislation implementing a directive, after the deadline for implementation has passed. Secondly, there are "non-conformity" cases, where a Member State has failed to implement a directive correctly. The final category is "bad application", where a Member State is failing correctly to apply Community environment law in practice in a particular case.

The infringement procedure consists of several stages defined in Article 226 of the EC Treaty. If the Commission finds that a Member State fails to comply with EU environment law, it will issue a letter of 'formal notice' to the responsible government. The government then has two months to respond with its comments. If this response is considered inadequate the Commission will issue a so-called 'reasoned opinion'. If the Member State then fails to comply within two months, the Commission can refer the case to the European Court of Justice. If the Court finds the Member State guilty of breaching Community law it may impose a fine in the form of a lump sum or penalty payment.

The Commission publishes each year a report on the Implementation and Enforcement of Community Environmental Law, and the European Court of Justice publishes information on the leading cases and judgements of the environmental law.

Box 2 Areas of Policy and Legislation

The acts of policy and legislation are grouped in the following 17 areas listed in alphabetical order:

1. Air
2. Biotechnology
3. Chemicals
4. Civil Protection and Environmental Accidents
5. Climate Change
6. Environmental Economics
7. Enlargement and Neighbouring Countries
8. Health
9. Industry and Technology
10. International Issues
11. Land Use
12. Nature and Biodiversity
13. Noise
14. Soil
15. Sustainable Development
16. Waste
17. Water

1.7 Policy Areas

The EU environmental legislation includes in 2007 several hundred legal acts. Most are directed towards a special medium or sector, such as water, air, nature, waste, and chemicals. Others deal with cross-cutting issues, e.g. access to environmental information, and public participation in environmental decision-making (Box 2.)

All relevant areas will be briefly described below and the most important legal texts listed and links given. Texts are based on the EU Commission and DG Environment website. In several areas the legalisation is fairly complex and in these cases a selection has been made. The complete texts can be found in the links provided. In addition information from some integrated areas (e.g. energy) is included.

The original legally valid document (directives and their amendments) are found as pdf documents indicated with links on the website. The review of environmental legislation here is mostly based on the introductory texts available for each of the policy areas.
Link http://ec.europa.eu/environment/index_sv.htm.

1.8 Economic Instruments

As a sharp contrast to the extensive body of European Union common environmental regulations, the EU does not have a common tax policy, with the exception of EU regulations on minimum taxes for fuels. The use of economic instruments

to support the implementation of EU environmental policy is thus left to each Member State individually.

The European Environmental Agency has, in cooperation with the Organisation for Economic Co-operation and Development, OECD, established a considerable database on environmental economic policies and the use of environmental economic instruments within the EU and OECD Member States. The database allows the user to select either one or more sectors of the economy or one or more household expenditure categories. The query will then list all the instruments to which these sectors/categories have been linked.

The information is available in the following areas: Water Pollution, Air Pollution, Climate Change, Land Contamination, Waste Management, Natural Resource Management, Noise, Ozone Layer Protection, Energy Efficiency, Transport, Land Management.

Environmentally Related Taxes, Fees and Charges can be studied e.g. revenues generated, tax rates, tax ceilings and exemptions in environmentally related taxes. There are also data on Tradable Permit Systems, Deposit-Refund Systems and Environmentally Motivated Subsidies.
Link http://www2.oecd.org/ecoinst/queries/index.htm

1.9 The European Economic Area

EFTA, the European Free Trade Association, was created by seven, later expanded to nine, European states in 1960. Since then several of these joined the European Union. In 1992 the remaining countries – Iceland, Liechtenstein and Norway – entered into the *European Economic Area* (EEA) Agreement with EU, which entered into force in 1994.

The EEA was maintained because of the wish of the three countries to participate in the Internal Market, while not assuming the full responsibilities of EU membership. The cooperation is very close as all new Community legislation in areas covered by the EEA, which include environmental legislation, is integrated into the Agreement through an EEA Joint Committee decision, and subsequently becomes part of the national legislation of the EEA EFTA States. In addition, the three EEA EFTA States fully participate in the European Environment Agency. The EEA EFTA States are, of all the countries associated with the Union, technically the most closely linked to the EU. Thus, in effect, the EU environmental legislation applies in 30 of the European countries.

Politically, however, the fact that EU membership is not on the current agenda for any of the EEA EFTA countries distinguishes them from other close neighbours, who have EU membership as a declared objective. These include Turkey and the Balkan countries. Switzerland is unique as it stands outside almost all international cooperation.

1.10 European Neighbourhood Policy

The European Neighbourhood Policy (ENP) goes beyond existing relationships with the neighbouring countries to offer substantial technical, political and financial support in several areas including issues such as energy, transport and the environment. It is based on the Commission Communication "Wider Europe" from 2003, a Strategy Paper from 2004, and a report on implementation from 2006. ENP applies to the EU's immediate neighbours by land or sea.

In the Baltic Sea region ENP includes Belarus and Ukraine. The ENP process is based on country reports and an action plan for each country. The ENP Action Plan for Ukraine was agreed on in early 2005. For Belarus ENP is not yet 'activated' since no Cooperation Agreement, which forms the base of the ENP agreement, is in force.

The relations with Russia are not part of ENP but developed through a Strategic Partnership covering four so-called 'common spaces'. (Common economy; freedom, security and justice; external security; research, education, culture.) Environmental concerns are not included.

Up to 2006, ENP assistance was provided under geographical (TACIS for Central Europe and Russia and MEDA for the Mediterranean area), and thematic programmes such as EIDHR (European Initiative for Democracy and Human Rights). From 2007 these have been replaced by the European Neighbourhood and Partnership Instrument (ENPI), designed to target sustainable development and approximation to EU policies and standards. For 2007-2013 the ENPI budget is approximately 12 billion euros. The ENPI cross-border cooperation (CBC) programme, which supports activities across the EU's external borders in the East and the South, is funded with 1.18 billion euros for the period 2007-2013.
Link http://ec.europa.eu/world/enp/index_en.htm

1.11 Global Cooperation

Most environmental problems are transboundary, often global, and can only be addressed effectively through international cooperation. For this reason, the EC Treaty establishes that one of the key objectives of Community policy on the environment is to promote measures at international level to deal with regional or worldwide environmental problems. The Union is also part of a number of international bodies in which it plays an import role, as it represents a considerable group of countries. It is in these many of the international conventions and other agreements are worked out. The most important include the United Nations with its institutions such as the Commission on Sustainable Development, and United Nations Environment Programme (UNEP), the Organisation for Economic Cooperation and Development (OECD) and the G8 group.

Box 3 International Environmental Agreements

International environmental agreements to which the EU is a Party or a Signatory listed according to theme

Geneva Convention on Long-range Transboundary Air Pollution, CLRTAP (1979)

Convention on Biological Diversity, CBD (1992) and the Cartagena Biosafety Protocol (2000)
Rotterdam Convention on Prior Informed Consent on hazardous chemicals, PIC (1998)

Stockholm Convention on Persistent Organic Pollutants, POP (2001)
Helsinki Convention on Industrial Accidents (1992)

Barcelona Convention to reduce pollution in the Mediterranean Sea (1976)
Helsinki Convention on the protection of the marine environment of the Baltic Sea (1992)
OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic (1992)
Bonn Agreement on cooperation for combating pollution in the North Sea Area (1983)
Lisbon Agreement on the Protection of the Coasts and the North-East Atlantic against Pollution (1990)

United Nations framework Convention on Climate Change, UNFCCC (1992) and the Kyoto protocol (1997)
Vienna Convention for the Protection of the Ozone Layer (1985) and the Montreal protocol (1987)

Aarhus Convention (1998) on access to environmental information
Espoo Convention on Environmental Impact Assessment (1991)

Alpine Convention (1991)
Bonn Convention on the Conservation of Migratory Species, CMS (1979)
Bern Convention on European Wildlife and Habitats (1979)

Convention on the Conservation of the marine fauna and flora of the Antartic (1980)

United Nations Convention to Combat Desertification, UNCCD (1994)

Basel Convention on hazardous wastes (1989)

Helsinki Convention on Watercourses and International Lakes (1992)
River basin conventions (Danube (1987), Elbe (1990), Oder (1996), Rhine (1999))

The European Community participate in international environmental agreements, together with its Member States. The 6th EAP of the EU is asking for "swift ratification, effective compliance and enforcement of all international conventions and agreements relating to the environment where the Community is a Party". The Union has also already ratified many International Environmental Agreements both on a global level (multilateral conventions negotiated under the auspices of the UN), regional level (e.g. in the context of UN/ECE or the Council of Europe), and sub-regional level (for instance for the management of seas or transboundary rivers).

The matters addressed by these agreements are very wide, and include among other the following areas: biodiversity and nature protection, climate change, protection of the ozone layer, desertification, management of chemicals and waste, transboundary water and air pollution, environmental governance (including impact assessments, access to information and public participation), industrial accidents, maritime and river protection, and environmental liability (Box 3).

The Union has an important role in the follow-up of several international conference in the field of environment and sustainable development, including the Rio (UNCED) and Johannesburg (WSSD) conferences. The Johannesburg Plan of Implementation (JPol) and the Political Declaration adopted in Johannesburg, together with the Doha Development Agenda (Trade) and the Monterrey consensus (Financing for Development), have shaped a global partnership for sustainable development. This partnership includes commitments to increased development assistance and market access for developing countries, good governance and a better protection of the environment.

2. AIR

2.1 Clean Air for Europe

Air pollution has been one of Europe's main political concerns since the late 1970's. European Union policy included the control of emissions from stationary sources, in particular large power plants and other installations in the energy sector, but also mobile sources, e.g. through requests on fuel quality.

Air quality trends in the Community are overall encouraging. Since the 1970's the air pollution in Europe has decreased by some 80%. Still the Sixth Environmental Action Programme includes air pollution as one of the issues under Environment and Health, where new efforts are considered necessary. The objective is to "achieve levels of air quality that do not give rise to unacceptable impacts on, and risks to, human health and the environment".

EU work to reduce air pollution includes EC legislation, international agreements to reduce cross-border pollution, sectors responsible for air pollution, national, regional authorities and NGOs, and research. The focus is implementation of air quality standards and coherency of all air legislation and related policy initiatives. Data on pollutants and their effects on health are provided by the Air Quality Guidelines of the World Health Organisation (WHO) and from the European Environmental Agency.

In order to integrate the work of the Union on combating air pollutions the Commission launched in March 2001 the CAFE Programme (Communication COM(2001)245). CAFE which is short for "Clean Air for Europe" is a programme of technical analysis and policy development underpinning the Thematic Strategy on Air Pollution. CAFE aims to develop long-term, strategic and integrated policy advice to protect against significant negative effects of air pollution on human health and the environment. The implementation of the Thematic Strategy started in September 2005. The Council adopted unanimously the Council Conclusions on the Thematic Strategy in March 2006.

The member states are requested to report on air quality data, as regulated in Council Decision 97/101/EC. It establishes a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States. This *EoI Decision* describes the procedures for the dissemination of air quality monitoring information to the Commission and to the public.

Link http://ec.europa.eu/environment/air/

Link http://ec.europa.eu/environment/air/cafe/index.htm

2.2 The Convention on Long Range Transboundary Air Pollution

The United Nations Economic Commission for Europe, UN-ECE, introduced in 1979 the Convention on Long Range Transboundary Air Pollution, to which EU is a partner. To the Convention has been added a total of 8 protocols, in particular a protocol on sulphur in 1985, on nitrogen oxides in 1988, on VOC, Volatile Organic Compounds in 1991, a second sulphur protocol in 1994, and a protocol on heavy metals and one on POPs in 1998. The development of the Convention continues with protocols on integration and multiple effects of pollutants.

The Convention has been successful as far as air pollution in Europe has decreased considerably over the period of its existence. The Convention management includes the EMEP programme for monitoring and evaluation with a Data Centre for systematic reports and studies of the effects. There is also a considerable cooperation with IIASA in these matters.

Link http://www.unece.org/env/lrtap/

2.3 The Air Quality Framework Directive and its Daughter Directives

The Council Directive 96/62/EC on ambient air quality assessment and management is commonly referred to as the *Air Quality Framework Directive*. It describes the basic principles as to how air quality should be assessed and managed in the Member States. It lists the pollutants for which air quality standards and objectives have been and will be developed and specified in legislation.

Council Directive 1999/30/EC specifies limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air. The directive is the so-called *First Daughter Directive*. The directive describes the numerical limits and thresholds required to assess and manage air quality for the pollutants mentioned. It addresses both PM_{10} and $PM_{2.5}$ but only establishes monitoring requirements, no limit values, for fine particles.

Directive 2000/69/EC, the *Second Daughter Directive*, specifies limit values and numerical criteria relating to the assessment and management of benzene and carbon monoxide in ambient air.

Directive 2002/3/EC, the *Third Daughter Directive*, established target values and long term objectives for the concentration of ozone in air. Ozone is a secondary pollutant formed in the atmosphere by the chemical reaction of hydrocarbons and nitrogen oxides ion in the presence of sunlight. The directive therefore also describes certain monitoring requirements relating to volatile organic compounds and nitrogen oxides in air.

Directive 2004/107/EC, the *Fourth Daughter Directive*, completes the list of pollutants initially described in the Framework Directive, with arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air. Target values for all pollutants except mercury are defined for the listed substances. For PAHs, the target is defined in terms of concentration of benzo(a)pyrene, which is used as a marker substance. Monitoring requirements are specified only for mercury.

The Commission adopted a proposal for a directive on ambient air quality at the same time as it adopted the thematic strategy on air pollution. This new proposal includes the following key elements:

- that most of existing legislation, except for the fourth daughter directive, be merged into a single directive with no change to existing air quality objectives
- new air quality objectives and monitoring requirements for $PM_{2.5}$ (fine particles)
- the possibility to discount natural sources of pollution when assessing compliance against limit values
- absolute time extensions of up to five years for compliance with the dates of entry into force of existing limit values.

The directive proposal is subject to the co-decision procedure and will only enter into force once adopted by both the Council of Ministers and the European Parliament.
Link http://ec.europa.eu/environment/air/existing_leg.htm

2.4 Air Quality Standards

The European Union has developed an extensive body of legislation which establishes health based standards and objectives for a number of pollutants in air. These standards and objectives are summarised in a table (see link). They apply over differing periods of time because the observed health impacts associated with the various pollutants occur over different exposure times. A limit value is legally binding. A target value is to be attained as far as possible by the given attainment date and is less strict than a limit value.

The legislation requires that the Member States divide their territory into a number of zones and agglomerations in which they should undertake assessments of air pollution levels using measurements and modelling and other empirical techniques. Where levels are elevated, an air quality plan or programme should be prepared to ensure compliance with the limit value before the date when the limit value formally enters into force. Information on air quality should be disseminated to the public.
Link http://ec.europa.eu/environment/air/quality.htm

2.5 Emissions from Traffic on Road, Sea and Air

The EU transport system is currently not sustainable, and in many respects moving away from sustainability rather than towards it. The European Environment Agency has highlighted the sector's growing CO_2 emissions that threaten the EU meeting its target under the Kyoto protocol. It also pointed to the large proportion of the population that is exposed to air pollution and other environmental impacts from transport, even if emissions are measurably falling (even though traffic volumes continue to rise). A number of pieces of legislation have been developed to control air pollution from vehicles.

Motor vehicle emissions are regulated by Directive 70/220/EEC (light vehicles) and 88/77/EC (heavy vehicles) with amendments. By the Auto-Oil Programme stricter limit values for carbon monoxide (CO), Volatile Organic Compounds (VOC), nitrogen oxides (NO_X) and particles will be implemented for light (Directive 98/69/EC) and heavy duty (Directive 1999/96/EC) vehicles. By the Auto-Oil Programme the manufacturers are responsible for the emissions from light vehicles during five years or 80,000 km, whichever occurs first. A similar legislation is on its way for heavy-duty vehicles.

In January 2007 the European Commission proposed new standards for transport fuels that will ask suppliers to reduce the greenhouse gas emissions caused by the production, transport and use of their fuels by 10% between 2011 and 2020. This will cut emissions by a cumulative total of 500 million tonnes of carbon dioxide by 2020.

Directive 98/70, as amended by Directive 2003/17/EC, contains the environmental fuel quality specifications for petrol and diesel fuels in the Community with the main focus on sulphur and, for petrol, on lead and aromatics. Since 1 January 2005 the limit on the sulphur content of petrol and diesel is 50 ppm and Member States are required to start phasing in ultra-low sulphur fuel with a maximum10 ppm sulphur content. Since 1 January 2002 all petrol sold in the EU is unleaded. A new petrol blend will be established allowing higher content of the biofuel ethanol; sulphur levels in diesel and gasoil will be cut to reduce emissions of dangerous dust particles.

Ships are fast becoming the biggest source of air pollution in the EU. In 2000 EU-flagged ships emitted almost 200 million tonnes of carbon dioxide. This is significantly more than emissions from EU aviation. In November 2002, the European Commission adopted a European Union strategy to reduce atmospheric emissions from seagoing ships. The strategy sets out a number of actions to reduce the contribution of shipping to acidification, ground-level ozone, eutrophication, health, climate change and ozone depletion. Air pollutant emissions from ships are also covered by Annex VI of the Marine Pollution Convention, MARPOL 73/78, of the International Maritime Organization with provisions on sulphur and nitrogen oxide emissions standards for ships' engines.

Engines in non-road mobile machinery, such as engines in excavators, bulldozers, front loaders, etc. are regulated by Directive 97/68/EC.
Link http://ec.europa.eu/environment/air/transport.htm

2.6 Emissions from Industrial Sources – Large Combustion Power Plants

Control of emissions from large combustion plants – those with a rated thermal input equal to or greater than 50 MW – plays an important role in the Community's efforts to combat acidification, eutrophication and ground-level ozone. Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants, the *LCP Directive*, entered into force in November 2001. It repealed the old Directive on large combustion plants (Directive 88/609/EEC) and tightened the Community requirements for air pollution control from new combustion plants in line with the substantial technical progress in the area.

The LCP Directive encourages the combined generation of heat and power and sets specific emission limit values for the use of biomass as fuel. It also includes gas turbines in its scope in order to regulate NO_X emissions. In particular, the LCP Di-

rective requests that plants licensed after November 2002 will have to comply with the emission limit values for SO_2, NO_X and dust, and that plants licensed after July 1987 and before November 2002, will have to comply with certain of these emission limit values. The LCP Directive also requires significant emission reductions from ”existing plants” (licensed before 1 July 1987) to be achieved by January 2008.

A national emission reduction plan, whether used alone or as part of a combined approach, must address all the three pollutants covered by the Directive for all the plants covered by the plan. The plants covered by the LCP Directive are also covered by the Integrated Pollution Prevention and Control (IPPC) Directive. In this respect, the LCP Directive only sets minimum obligations, which are not necessarily sufficient to comply with the IPPC Directive.

Link http://eur-lex.europa.eu/LexUriServ/site/en/consleg/2001/L/02001L0080-20011127-en.pdf

3. CHEMICALS

3.1 The Dilemma of Chemicals Control

The need to protect the environment by creating common standards for products, amongst them dangerous chemicals, was recognized early. But the systems introduced have not been sufficient to deal with the problems. There is still no legal instrument to ensure the safe use of the most substances. Today there are more than 100,000 substances used in the Union; most of them have not been tested for toxicity. If there is a suspected damage caused by a chemical the burden of proof is not on the industry, which have used or produced the chemical, but the victim or on the public authorities.

Many pieces of Community legislation have been adopted to handle chemicals. These include Regulations on Pesticides; Worker Protection; Prevention of Chemical Accidents and Reduction of Industrial Emissions e.g. Volatile Organic Compounds and Mercury. In addition, work is progressing in particular on Endocrine Disrupting Chemicals and on Dioxins.

3.2 The REACH Regulation

The Commission proposed a new EU regulatory framework for the *Registration, Evaluation and Authorisation of Chemicals (REACH)* in October 2003. REACH is based on the idea that industry itself is best placed to ensure, that the chemicals it manufactures and puts on the market do not adversely affect human health or the environment. This requires that industry has knowledge of the properties of its substances and manages potential risks. Authorities should focus their resources on ensuring that industry is meeting its obligations and taking action when needed.

REACH will create a single system for both what are currently described as “existing” and “new” substances, and for all of them ensure registration, evaluation and authorisation. *Registration* requires manufacturers and importers to obtain relevant information on their substances and to use that data to manage them safely. To reduce testing on vertebrate animals, *data sharing* is required for studies on such animals. For other tests, data sharing is required on request. Better *information* on hazards and risks and how to manage them will be passed down and up the supply chain. *Downstream users* are brought into the system.

Evaluation is undertaken by the forthcoming European Chemicals Agency to evaluate testing proposals made by industry or to check compliance with the registration requirements. The Agency will also co-ordinate substance evaluation by the authorities to investigate chemicals with perceived risks. Substances will be made subject to *authorisation*. Applicants will have to demonstrate that risks associated with uses of substances are adequately controlled or that the socio-economic benefits of their use outweigh the risks. Applicants must also analyse whether there are safer suitable alternative substances or technologies, and if there are, they must prepare substitution plans, or provide information on research and development activities. The *restrictions* provide a procedure to regulate that the manufacture, placing on the market or use of certain dangerous substances shall be either subject to conditions or prohibited. Thus, restrictions act as a safety net to manage Community wide risks that are otherwise not adequately controlled.

The European Chemicals Agency (ECHA), which will manage the technical, scientific and administrative aspects of the REACH system at the Community level, will create a *classification and labelling inventory* of substances will help promote agreement within industry on their classification.

Link http://ec.europa.eu/environment/chemicals/index.htm

3.3 Scope of REACH

The REACH Regulation, was formally adopted on 18 December 2006. It will eventually replace a number of legal documents, such as the Directive on the Classification, Packaging and Labelling of Dangerous Substances, and on the Evaluation and Control of the Risks of Existing Substances; and the Directive on Restrictions, Marketing and Use of certain Dangerous Substances.

REACH covers all substances whether manufactured, imported, used as intermediates or placed on the market, either on their own, in preparations or in articles, unless they are radioactive, subject to customs supervision, or are non-isolated intermediates. Waste is specifically exempted. Food is not subject to REACH as it is not a substance, preparation or article.

Other substances are exempted where other equivalent legislation applies.

There is a general obligation for manufacturers and importers of substances to submit a registration to the Agency for each substance manufactured or imported in quantities of 1 tonne or above per year. Manufacturers and importers of substances will need to obtain information on the substances they manufacture or import, and use this information to assess the risks arising from the uses, and to ensure that the risks which the substances may present are properly managed. Registration requires manufacturers and importers to submit a technical dossier, for substances in quantities of 1 tonne or more, and a chemical safety report for substances in quantities of 10 tonnes or more.

To find out the *properties of the substances* new tests are only required when it is not possible to provide the information in any other permitted way. Where new tests are carried out there are general provisions on the generation of information to ensure the quality of toxicological and eco-toxicological tests and analyses. A defined set of information is asked for persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) substances or substances that are potentially dangerous to health or the environment. A *chemical safety report* (CSR) is requested for substances manufactured or imported in quantities starting at 10 tonnes. The CSR must include an exposure scenario on the appropriate risk management measures and operational conditions that ensure that the risks from the uses of the substance are adequately controlled. For intermediates, that is substances that are used in the manufacturing process, but are consumed or transformed into another substance, special rules apply.
Link http://ec.europa.eu/environment/chemicals/reach/reach_in_brief04_09_15.pdf

3.4 The Implementation of REACH

REACH entered into force on 1 June 2007. After that, there will be an additional year before the main REACH procedures start to apply in order to allow the new European Chemicals Agency to be established in Helsinki, Finland, to become fully operational. Then the industry will start to submit pre-registration dossiers for existing substances and registration dossiers for new substances.

To facilitate the transition to the REACH system, the registration provisions will be applied in a step-wise fashion. A series of registration deadlines are established for the different tonnage ranges, although certain substances of high environmental concern will need to be registered early. About 30,000 phase-in substances (excluding intermediates) are expected to be registered over the first 11 years after the entry into force of REACH, plus a number of "non-phase-in" substances. For the registration of substances in articles (e.g. manufactured goods such as cars, textiles, electronic chips), a special regime applies. REACH requires all substances that are intended to be released from articles during normal and reasonably foreseeable conditions of use to be registered according to the normal rules, including tonnage, deadlines and information requirements, if those substances are present in the articles above 1 tonne per year. As a safety net, the Agency can require a registration of a substance in an article at any time when it considers that its release poses a risk to human health or the environment.

To enable a smooth transition from the existing chemicals legislation to REACH, the Commission has developed an interim strategy. The main purpose of this interim strategy is to ensure that all stakeholders, especially industry and public authorities, are adequately prepared for the practical application of the new system by the time REACH enters into force.
Link http://ec.europa.eu/environment/chemicals/reach/reach_in_brief04_09_15.pdf

3.5 The Directives on Existing Substances, EINECS and ELINCS

In the 1960´s the national provisions on chemicals differed widely and thus hindered the trade of the European Community. In addition, it was recognised that there was a need to ensure the protection of public health, in particular the health of workers handling dangerous substances. Directive 67/548/EEC in 1967 approximated the national provisions relating to dangerous substances. The Directive introduced common provisions on the classification, packaging and labelling of dangerous substances. Since its adoption in 1967, the Directive has constantly been updated in order to take into account scientific and technical progress to make sure a high level of protection of man and the environment, as well as the correct functioning of the internal market is guaranteed.

The 6th amendment of the Directive in 1979 introduced a notification system for "new" substances. In consequence it required the establishment of the list of "existing" substances, called EINECS. EINECS is the European Inventory of Existing Commercial Chemical Substances and lists all substances that were reported to be on the market on or before 18 September 1981. EINECS is listing about 100,000 existing substances – counting for about 99% of the chemicals' volume on the market. The substances placed on the market for the first time after this target date are considered "new" and are added to ELINCS. ELINCS is European LIst of Notified Chemical Substances. New substances are required to be tested and notified before marketing in volumes above 10 kg.

The core of the EU's 'Existing Substances Program' is to ensure better management of risks of existing substances to

man and the environment. Hence, risk assessment reports and risk reduction strategies create the necessary basis for the implementation of risk reduction measures. The 7th amendment of the Directive in 1992 required a risk assessment for "new" substances. It further introduced the "sole representative" in the notification system, and added the Safety Data Sheet as a hazard communication facility for the professional user.

The notification system of 'new substances' will be substituted by REACH. The classification and labelling system of the Directive 67/548/EEC will be substituted by the implementation of the *Globally Harmonised System* (GHS), the global measure corresponding to REACH.

Links http://ec.europa.eu/environment/dansub/home_en.htm
http://ec.europa.eu/environment/chemicals/exist_subst/index.htm

3.6 Plant Protection Products and Biocides

Pesticides are chemical products that are used to destroy or otherwise control pests and other harmful organisms. There are significant economic and other benefits related to the use of pesticides, but they also cause concern for human health and the environment.

Pesticides contain one or more biologically active substances that have the controlling effect on the unwanted organisms. Unfortunately, these substances are often also harmful to non-target organisms. Therefore, in many countries, pesticides have been subject to strict control for long time already. Specific assessment and approval schemes have been established to prevent unacceptable effects on human health and the environment and to ensure that products are effective and suitable for their purpose.

In Community legislation, pesticides have been divided into two major groups, plant protection products and biocidal products. Products belonging to these groups need to be assessed and authorised before they can be placed on the market. In addition, certain pesticides are subject to prohibitions or restrictions and regulations concerning control of international trade. As many pesticides are deliberately released to the environment, they are also a source of surface and ground water pollution. Therefore they are subjects of water legislation as well. All in all, the sustainable use of pesticides is an issue recognised to be of major importance in the Sixth Environment Action Program.

Links http://ecb.jrc.it/biocides/
http://ec.europa.eu/environment/chemicals/preparing/interim.htm

3.7 POPs – Persistent Organic Pollutants

Persistent organic pollutants (POPs) are chemical substances that persist in the environment, bioaccumulate through the food web, and pose a risk of causing adverse effects to human health and the environment. This group of priority pollutants consists of pesticides (such as DDT), industrial chemicals (such as polychlorinated biphenyls, PCBs) and unintentional by-products of industrial processes (such as dioxins and furans). Persistent Organic Pollutants are transported across international boundaries far from their sources, even to regions where they have never been used or produced. Consequently, persistent organic pollutants pose a threat to the environment and to human health all over the globe.

Two international legally binding instruments control POPs. The Protocol on POPs to the UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP), which entered into force in 2003, and the global Stockholm Convention on POPs, which entered into force in 2004. These instruments establish strict international regimes for 16 POPs in the UNECE Protocol and 12 POPs in the Stockholm Convention. Both instruments also contain provisions for including additional chemicals into these lists.

The European Community has signed both international instruments on POPs, together with the then 15 Member States, and they are now included in Regulation (EC) No 850/2004 on persistent organic pollutants. They lay down the following control measures: Prohibition or severe restriction of the production and use of intentionally produced POPs. Restrictions on export and import of the intentionally produced POPs (Stockholm Convention). Provisions on the safe handling of stockpiles (Stockholm Convention). Provisions on the environmentally sound disposal of wastes containing POPs. Provisions on the reduction of emissions of unintentionally produced POPs (e.g. dioxins and furans).

The new Regulation complements the earlier Community legislation on POPs and aligns it with the provisions of the international agreements on POPs. The European Community Implementation Plan to the Stockholm Convention, which complements the national plans of the EU Member States, was adopted on 9 March 2007.

Link http://ec.europa.eu/environment/pops/index_en.htm

3.8 Directives on Chemical Accidents (Seveso II)

The "Seveso" accident happened in 1976 at a chemical plant in Seveso, Italy, manufacturing pesticides and herbicides. A dense vapour cloud containing tetrachlorodibenzoparadioxin (TCDD), commonly known as dioxin, was released from a reactor, used for the production of trichlorofenol. Although no immediate fatalities were reported, kilogramme quantities of the substance lethal to man even in microgramme doses were widely dispersed which resulted in an immediate contamination of some ten square miles of land and vegetation. More than 600 people had to be evacuated from their homes and as many as 2000 were treated for dioxin poisoning.

In 1982, *Council Directive 82/501/EEC on the major-accident hazards of certain industrial activities* – so-called Seveso Directive – was adopted. In the light of severe accidents at the Union Carbide factory at Bhopal, India in 1984 where a leak of methyl isocyanate caused more than 2,500 deaths and at the Sandoz warehouse in Basel, Switzerland in 1986 where fire-fighting water contaminated with mercury, organophosphate pesticides and other chemicals caused massive pollution of the Rhine and the death of half a million fish, the Seveso Directive was amended twice, in 1987 by *Directive 87/216/EEC* and in 1988 by *Directive 88/610/EE*. Both amendments aimed at broadening the scope of the Directive, in particular to include the storage of dangerous substances.

In 1996, *Council Directive 96/82/EC on the control of major-accident hazards* – so-called Seveso II Directive – was adopted. The Seveso II Directive has fully replaced its predecessor, the original Seveso Directive. Important changes includes a revision and extension of the scope, the introduction of new requirements relating to safety management systems, emergency planning and land-use planning and a reinforcement of the provisions on inspections to be carried out by Member States.

In the light of recent industrial accidents (Toulouse, Baia Mare and Enschede) and studies on carcinogens and substances dangerous for the environment, the Seveso II Directive 96/82/EC was extended by the Directive 2003/105/EC. The most important extensions of the scope of that Directive are to cover risks arising from storage and processing activities in mining, from pyrotechnic and explosive substances and from the storage of ammonium nitrate and ammonium nitrate based fertilizers.

Link http://ec.europa.eu/environment/seveso/index.htm

3.9 Large Oil Spills at Sea

Europe is the world's largest market in crude oil imports, representing about one third of the world total. Ninety percent of oil and refined products are transported to and from Europe by sea. Accidents resulting in massive spill, such as "Prestige" or "Erika", provide gripping illustrations of the problem of vessel pollution. Large oil spills at sea constitute a threat to the environment, placing enormous demands on the national authorities responsible for response and clean-up operations.

Besides accidental pollution, caused by ships in distress, there are three types of routine ship operations, which pollute the sea: ballast water, tank washings and engine room effluent discharges. Due to these operations large amounts of oil are pumped deliberately from ships every day, along almost the entire coastline of Europe. This is the greatest source of marine pollution by ships, and the one that poses an insidious long-term threat to the marine and coastal environment.

At present, the legal basis of Community action is found in Decision 2850 of 20/12/2000 on a framework for cooperation in the field of accidental or deliberate marine pollution with the aim to support and supplement Member States' efforts. Council Decision of 23 October 2001, which established a mechanism for reinforced cooperation in civil protection assistance interventions covering both civil protection and marine pollution, has had a significant impact. At the same time the European Maritime Safety Agency (EMSA) has increased its role. In December 2006 the Commission issued a Communication (2006/0863) on the current preparedness and response of Community to marine pollution, indicating how to continue and promote this field from 2007 and on.

Link http://ec.europa.eu/environment/civil/marin/mp02_en_legislation.htm

4. ENERGY

4.1 Energy and Environment

All energy production and consumption has environmental impacts. Energy related emissions contribute to pollution of air, water and soil while also posing risks to human health, nature and biodiversity. EU sustainable energy policies aim to reduce these threats, while ensuring the security of supply and the competitiveness of the EU industries.

The EU has made a commitment to integrate environmental concerns into all relevant policy areas, including energy. This work is an ongoing process requiring efforts in a number of areas including setting ambitious targets for increasing *energy efficiency* and share of *renewable energies* in overall energy mix and for alternative fuels, as well as ensuring the internal energy market by separating energy production from distribution.

Comparison of the energy related effects on environment and human health from different energy sources is often not straightforward and energy modelling is thus needed to guide the policy decisions in selection of the relevant policy measures and the choice between different energy sources.

Climate change is currently the most serious threat to the natural environment and human health with potentially devastating economic costs to the societies worldwide. Since 80% of the greenhouse gases originate from heat and power production as well as from transport, one of the main energy-related policy drivers in the EU is the reduction of greenhouse gases (GHG) at their sources. This is persued in the *European Climate Change Programme* (ECCP), the greenhouse gas trading *Emissions Trading Scheme* (ETS), limiting air pollution through *National Emission Ceilings* (NEC) directive, and developing common rules for *Carbon Capture and Storage* (CCS).

The 2007 Spring European Council adopted an energy policy for Europe, aiming at saving energy and promoting climate-friendly energy sources. EU leaders set a firm target of cutting 20% of the EU's greenhouse gas emissions by 2020 – the EU will be willing to put this goal up to 30% if the US, China and India make similar commitments. EU leaders also set a binding overall goal of 20% for renewable energy sources by 2020, compared to the present 6,5%. A binding minimum target of 10% for the share of biofuels in overall transport petrol and diesel consumption by 2020 was also set.

With the exception of carbon dioxide trading, legislation in this area is rather weak and development is rather promoted through policy actions and support programmes. Below existing and planned legislation will be described in the context of the European energy policy.

4.2 Energy Efficiency

The European Community, together with its Member States, is working intensively to improve energy efficiency in all sectors whilst at the same time increasing the use of renewable energies. This can be a key issue to solve environmental, self-sufficiency and cost problems and adequately provide for increasing energy demand without major upheavals. Improved energy efficiency will play a key role in meeting the EU Kyoto target in an economic way.

The Green Paper on Energy Efficiency points to the fact that the EU could save at least 20% of its present energy consumption in a cost-effective manner, equivalent to 60 billion euros per year, or the present combined energy consumption of Germany and Finland. Energy saving is without doubt the quickest, most effective and most cost-effective manner for reducing greenhouse gas emissions, as well as improving air quality, in particular in densely populated areas.

In order to support better integration of energy efficiency measures into national legislation the European Commission has proposed several directives, which have been adopted and are now in force. These concern broad areas where there is significant potential for energy savings. They are:

- End-use Efficiency & Energy Services
- Energy Efficiency in Buildings
- Eco-design of Energy-Using Products
- Energy Labelling of Domestic Appliances
- Combined Heat and Power

A number of voluntary instruments were also adopted to foster better cooperation with industry. The European Parliament and the Council has proposed a Directive to promote energy end-use efficiency and energy services. The directive will establish targets, incentives and the institutional, financial and legal frameworks needed to eliminate barriers and imperfections in markets for energy services and for providing energy-saving programmes. The proposed directive includes an annual target to save 1% of the quantity of energy supplied and/or sold to the end customers.

The proposal is related to Council Directive 93/76/EEC on limiting carbon dioxide emissions by improving energy efficiency (SAVE). The Communication from the Commission – Energy efficiency in the European Community – Towards a strategy for the rational use of energy is of interest.
Link http://europa.eu/scadplus/leg/en/s14000.htm

4.3 Energy Performance of Buildings

Energy consumption for buildings-related services accounts for approximately one third of total EU energy consumption. The *Directive 2002/91/EC on the energy performance of buildings* is a follow-up to the measures on boilers (92/42/EEC), construction products (89/106/EEC) and SAVE programme provisions on buildings. The earlier directive on the energy certification of buildings (Directive 93/76/EEC repealed by Directive 2006/23/32/EC) does not have the same objectives as Directive 2002/91/EC, which propose actions to fill any existing gaps.

Directive 2002/91/EC concerns the residential sector and the tertiary sector (offices, public buildings, etc.). It covers all aspects of energy efficiency in buildings in an attempt to establish a truly integrated approach, while the scope of the provisions on certification does not include some buildings, such as historic buildings, industrial sites, etc.

The four main aspects of the proposed general framework are:

1. a common methodology for calculating the integrated energy performance of buildings;
2. minimum standards on the energy performance of new buildings and existing buildings that are subject to major renovation;
3. systems for the energy certification of new and existing buildings and, for public buildings, prominent display of this certification and other relevant information. Certificates must be less than five years old;
4. regular inspection of boilers and central air-conditioning systems in buildings and in addition an assessment of heating installations in which the boilers are more than 15 years old.

The Member States are responsible for drawing up the minimum standards. They will also ensure that the certification and inspection of buildings are carried out by qualified and independent personnel.

Related regulations are Directive 2006/32/EC on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC, Directive 2005/32/EC establishing a framework for the setting of eco-design requirements for energy-using products and amending Council Directive 92/42/EEC, and Directives 96/57/EC and 2000/55/EC.

Link http://ec.europa.eu/energy/demand/legislation/buildings_en.htm

4.4 Cogeneration

Cogeneration is a technique allowing the production of heat and electricity in a single process. There is considerable unexploited potential for cogeneration in the Member States. Moreover cogeneration reduces losses on the electrical grid because cogeneration installations are usually closer to the consumption point.

Electricity/heat cogeneration installations can achieve energy efficiency levels of around 90%. Electricity production from cogeneration accounted for 11% of total electricity production in the EU in 1998. With an increase to 18%, the energy savings could be 3-4% of total gross consumption in the EU. The development of cogeneration could avoid the emission of 127 million tonnes of CO_2 in the EU in 2010 and 258 million tonnes in 2020.

Directive 2004/8/EC on the promotion of cogeneration is based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC. The purpose of the Directive is to facilitate the installation and operation of electrical cogeneration plants. A forthcoming legislative framework on cogeneration should overcome the major obstacles of inadequate control of longstanding monopolies, inadequate support from regional and local authorities, incomplete liberalisation, regulatory obstacles having a negative effect, and lack of European standards for network connection.

There are already examples of regulatory developments in some Member States, such as Belgium (green certificates and cogeneration quotas), Spain (new decree on the sale of cogeneration electricity) or Germany (new law on cogeneration).

Related regulations are Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market and Directive 92/42/EEC on efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels.

Link http://ec.europa.eu/energy/demand/legislation/heat_power_en.htm

5. CLIMATE CHANGE

5.1 EC and the United Nations Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC), approved by the Union as Council Decision 94/69/EC, has the long-term objective to prevent dangerous anthropogenic interference with the climate system. Its Kyoto Protocol, signed in New York on 29 April 1998, requires the EC (consisting of the 15 Member States of before May 2004) to reduce greenhouse gas (GHG) emissions by 8% below 1990 levels by 2008-2012. Most of the 10 new Member States have the same target. The target for Hungary and Poland is -6% while Cyprus and Malta are no Annex-I Parties to the UNFCCC and thus have no targets.

The convention commits the Community and its Member States to develop, periodically update, publish and report to the Conference of the Parties national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol on ozone-depleting substances. Therefore, it is appropriate for the European Commission to provide for effective cooperation and coordination in relation to the preparation of reports, as well as review and compliance procedures obligations under the Kyoto Protocol, as agreed at the seventh Conference of the Parties to the UNFCCC in Marrakech (the Marrakech Accords). The European Environment Agency assists the Commission with monitoring activities, especially in the scope of the Community inventory system, and in the analysis by the Commission of progress towards the fulfilment of the commitments.

Link http://ec.europa.eu/environment/climat/gge.htm

5.2 European Climate Change Programme (ECCP)

Action by both Member States and the European Community needs to be reinforced if the EU is to succeed in cutting its greenhouse gas emissions to 8% below 1990 levels by 2008-2012, as required by the Kyoto protocol.

For this reason the Commission launched in June 2000 the European Climate Change Programme (ECCP). The goal of the ECCP is to identify and develop all the necessary elements of an EU strategy to implement the Kyoto Protocol. The development of the first ECCP involved all the relevant groups of stakeholders working together, including representatives from the Commission's different departments (DGs), the Member States, industry and environmental groups. The second European Climate Change Programme (ECCP II) was launched in October 2005.

Energy and transport play a large part in climate change since they are the leading sources of greenhouse gas emis-

sions; this is why energy policy is particularly important in the European Union's sustainable development strategy. The EU is increasingly dependent on energy imported from third countries, creating economic, social, political and other risks for the Union. The EU therefore wishes to reduce its dependence and improve its security of supply by promoting other energy sources and cutting demand for energy. Consequently, it is putting the accent, above all, on improving energy efficiency and promoting renewable energy sources.

The ECCP I showed many differences of implementation in the Member States. It also indicated that the existing database is, as yet, not detailed enough to fully assess the impacts of individual policies and measures on greenhouse gas emissions in a thorough quantitative manner. The Commission is therefore planning some further methodological work to start in 2007. It further began in June 2006 a study which focuses on the sectoral emission reduction potentials and economic costs for climate change. The main objective is to identify the least-cost contribution of different sectors and gases for meeting post-2012 EU-25 quantitative reduction objectives for all greenhouse gases, and to determine a package of cost-effective policies and measures for all sectors and gases towards meeting these objectives. This study will serve as the basis for evaluation of new policies and measures especially to meet post-2012 targets.

Link http://ec.europa.eu/environment/climat/eccp.htm

5.3 EU Emissions Trading Scheme (ETS)

In January 2005 the European Union Greenhouse Gas Emission Trading Scheme (EU ETS) commenced operation as the largest multi-country, multi-sector Greenhouse Gas emission trading scheme world-wide. The scheme is based on Directive 2003/87/EC, which entered into force on 25 October 2003.

Allowances traded in the EU ETS will not be printed but held in accounts in electronic registries set up by Member States. All of these registries will be overseen by a Central Administrator at EU level who, through the Community independent transaction log, will check each transaction for any irregularities. In this way, the registries system keep track of the ownership of allowances in the same way as a banking system keeps track of the ownership of money.

For the second trading period, running from 2008 to 2012, the Commission adopts the Decision on the national allocation plans during 2007.

On 20th December 2006, the Commission adopted a proposal for legislation to include aviation in the Emissions Trading Scheme. The proposal provides for aviation to be brought into the EU ETS in two steps. From the start of 2011, emissions from all domestic and international flights between EU airports will be covered. One year later the scope will be expanded to cover emissions from all international flights that arrive at or depart from an EU airport. The intention is for the EU ETS to serve as a model for other countries considering similar national or regional schemes, and to link these to the EU scheme over time. Therefore, the EU ETS can form the basis for wider, global action.

Link http://ec.europa.eu/environment/climat/emission.htm

5.4 The Community Strategy to Reduce CO_2 from Light Vehicles (Cars and Vans)

On 7 February 2007, the Commission adopted the Communication (COM(2007)19) outlining a comprehensive new strategy to reduce carbon dioxide emissions from new cars and vans sold in the European Union. The new strategy, should be seen together with the revision of EU fuel quality standards proposed on 31 January 2007 and the long-established objective of limiting average CO_2 emissions from new cars to 120 grams per km by 2012, a reduction of around 25% from current levels. To encourage the car industry to compete on the basis of fuel efficiency instead of size and power, the Commission is also inviting manufacturers to sign an EU code of good practice on car marketing and advertising.

Link http://ec.europa.eu/environment/co2/co2_home.htm

5.5 European Community Action to Reduce Ozone-Depleting Substances

The Union and its member states commitment under the Montreal Protocol, to phase out ozone-depleting substances, in particular, chlorofluorocarbons (CFCs), also contributes to limit climate change, since CFCs are potent green house gases.

The Regulation (EC) No 2037/2000 is the European Union's legislative instrument to phase out Ozone Depleting Substances (ODS). ODS covered by the Regulation are identified as controlled substances in line with the definitions of the Montreal Protocol. The Regulation includes controls on production, importation, exportation, supply, use leakage and recovery of controlled substances. It also establishes a licensing procedure for all imports of ODS. Since its adoption a long list of amendments have been added. Many of these concern specific chemical substances, while others are of more procedural character. A consolidated version of Regulation (EC) No 2037/2000, that includes all amendments until November 2006, is available.

Link http://ec.europa.eu/environment/ozone/index.htm

6. INDUSTRY AND TECHNOLOGY

6.1 The EU Industrial Environmental Regulations and Policies

The European Union has developed a considerable set of policy and legal instruments to promote the environmental improvement of European industry, the "greening of industrial production". When issuing a license or permit for an industrial productions, a list of environmental regulations have to be considered. These are all integrated in a so-called *integrated permit*, formulated according to the Integrated Pollution Prevention and Control, IPPC, Directive, which has the aim to ascertain that an industrial production, is using the best technique, and that the emissions are not moved between different media – air, water and soil – but cleaned, or eliminated at the source, when possible.

A number of "semi-legal" measures have been introduced to support the environmental improvement of industries. These include the introduction of Environmental Management Systems through the EMAS scheme, which is a Directive but with the unusual addition that it is not compulsory (obligatory). Secondly a system for the use of environmental labelling has been developed, the EU Flower. This green labelling is available but is not compulsory to use. Similarly the development of standardisations is also used as a means to introduce environmental improvements in many areas. Thus the wide use of standards is contributing to environmental protection. Another important part is the greening of the public use of products as the Greening of Public Procurement, GPP.

There are also a series of policy actions, which have a very large importance for the development of improvements in industrial productions. These include e.g. a considerable EU support to the development of technological improvements through research and development. These actions are coordinated within the EU Environmental Technologies Action Plan, ETAP. The Integrated Product Policy, IPP, is another very forceful policy development. The tools promoted under IPP are most importantly eco-design of products, support to Life Cycle Assessment LCA, recycling and improved materials management.

Below several of these policies will be shortly described and proper links provided.

6.2 The IPPC Directive

The EU common rules for permitting and controlling industrial installations, the IPPC Directive, *Directive 96/61/EC concerning integrated pollution prevention and control*, aims to minimise pollution from various industrial sources. Operators of industrial installations covered by Annex I of the IPPC Directive are required to obtain an authorisation, an integrated permit. About 50,000 installations are presently covered by the IPPC Directive in the EU. New installations, and existing installations which are subject to "substantial changes", have been required to meet the requirements of the IPPC Directive since 1999. Other existing installations must be brought into compliance by 30 October 2007. This is the key deadline for the full implementation of the Directive.

The IPPC Directive is based on the principles of (1) an integrated approach, (2) best available techniques, (3) flexibility and (4) public participation.

The *integrated approach* means that the permits must take into account the whole environmental performance of the plant, covering e.g. emissions to air, water and land, generation of waste, use of raw materials, energy efficiency, noise, prevention of accidents, and restoration of the site upon closure. The purpose of the Directive is to ensure a high level of protection of the environment taken as a whole.

The permit conditions, including emission limit values (ELVs), must be based on *Best Available Techniques* (BAT), as defined in the IPPC Directive. To assist the licensing authorities and companies to determine BAT, the European IPPC Bureau organises an exchange of information between experts from the EU Member States, industry and environmental organisations. The produced BAT Reference Documents (BREFs), which serves to guide the introduction of BAT in the integrated permit, are adopted and published by the Commission.

The IPPC Directive contains elements of *flexibility* by allowing the licensing authorities, in determining permit conditions, to take into account the technical characteristics of the installation, its geographical location, and the local environmental conditions.

The Directive ensures that the *public has a right to participate* in the decision making process, and to be informed of its consequences, by having access to permit applications in order to give opinions. The European Pollutant Emission Register (EPER), which contains emission data reported by Member States, are made accessible in a public register, which is intended to provide environmental information on major industrial activities. EPER will be replaced by the European Pollutant Release and Transfer Register (E-PRTR) from 2007 reporting period onwards.

Link http://ec.europa.eu/environment/ippc/index.htm

6.3 Development of the IPPC Directive

The original IPPC directive has been amended twice since it entered in force. The first amendment reinforced public participation in line with the Aarhus Convention. The second amendment clarified the relationship between the permit con-

ditions established in accordance with the IPPC Directive and the EU greenhouse gas emission trading scheme.

The Member States have chosen various approaches to implement the IPPC Directive, such as case-by-case permitting or use of general binding rules for industry sectors.

The Commission has adopted in November 2005 its first IPPC Report. It includes an IPPC Implementation Action Plan set up to support the Member States and monitor the progress made towards meeting the deadline of 30 October 2007 for the full implementation of the Directive.

Link http://ec.europa.eu/environment/ippc/index.htm

6.4 Eco-Management and Audit Scheme (EMAS)

The Eco-Management and Audit Scheme (EMAS) is the EU voluntary instrument, which acknowledges organisations that improve their environmental performance on a continuous basis. EMAS registered organisations are legally compliant, run an environment management system and report on their environmental performance through the publication of an independently verified environmental statement.

The scheme has been available since 1995 (Council Regulation (EEC) No 1836/93). It was originally restricted to companies in industrial sectors. Since 2001 EMAS has been open to all economic sectors including public and private services (Regulation (EC) No 761/2001). In addition, EMAS was strengthened by the integration of EN/ISO 14001 as the environmental management system required by EMAS, and by adopting an attractive EMAS logo to signal EMAS registration to the outside world.

Link http://ec.europa.eu/environment/emas/index_en.htm

6.5 Integrated Product Policy (IPP)

All products cause environmental degradation in some way, whether from their manufacturing, use or disposal. The *Integrated Product Policy* (IPP) seeks to minimise these by looking at all phases of a products' life cycle and taking action where it is most effective.

The life cycle of a product is often long and complicated. It covers all the areas from the extraction of natural resources, through their design, manufacture, assembly, marketing, distribution, sale and use to their eventual disposal as waste. At the same time it also involves many different actors such as designers, industry, marketing people, retailers and consumers.

With so many different products and actors there cannot be one simple policy measure for everything. Instead there are a whole variety of tools – both voluntary and mandatory – that can be used to achieve this objective. These include measures such as economic instruments, substance bans, voluntary agreements, environmental labelling and product design guidelines.

The Integrated Product Policy (COM(2003) 302 final) is not a regulation, but a set of support measures. It will seek to identify and stimulate action on products with the greatest potential for environmental improvement in three phases: First research to identify products with the greatest environmental impact, secondly by identifying measures to reduce their environmental impacts throughout their life cycles. Research in phase one and two is led by the Institute for Prospective Technological Studies (IPTS) in Seville. In the third phase the European Commission will seek to address policy measures for the products that are identified having the greatest potential for environmental improvement at least socio-economic cost.

Link http://ec.europa.eu/environment/ipp/home.htm

6.6 Implementing the Integrated Product Policy

The EIPRO, Environmental Impact of PROducts (phase 1) study, completed in May 2006, shows that products from only three areas of consumption – *food and drink, private transportation, and housing* – together are responsible for 70-80% of environmental impacts of private consumption. These products also account for some 60% of consumption expenditure altogether. All other areas of consumption together account for no more than 20-30%of most environmental impacts.

For the Second phase the Commission concluded that Life Cycle Assessments provide the best framework for assessing the potential environmental impacts of products currently available, but also that there is a need for more consistent data and consensus on LCA methodologies. The *European Platform of Life Cycle Assessment* includes a series of studies and workshops with the aim of producing a handbook on best practice, based on the best possible consensus. The objective is to promote life cycle thinking in business and in policy making focusing on underlying data and methodological needs. The project started in mid-2005 and is initially planned to run until mid-2008. It is a joint project between DG Environment and the Commission's Directorate-General Joint Research Centre (JRC-IES).

A series of policy tools to address the need for improved environmental profiles of products, *eco-design initiatives*, already exists and are now assembled under the IPP programme. The Directive 2005/32/EC on the *Eco-design of Energy-using Products* (EuP), such as electrical and electronic devices or heating equipment, provides coherent EU-wide rules for eco-design and ensure that disparities among national regulations do not become obstacles to intra-EU trade. The Directive does not introduce directly binding requirements for specific products, but does define conditions and criteria for setting requirements regarding environmentally relevant product char-

acteristics (such as energy consumption) and allows them to be improved quickly and efficiently. The labelling of green products, the *European eco-label* is one more tool for promoting environmentally good design of products. Public procurement accounts for around 16% of the EU's GDP. The *Greening of Public Procurements* (see below) is a powerful tool for promoting environmentally beneficial markets. Standards for almost any product, service or process are powerful tools for influencing the market. *Integration of environmental aspects in standardisation* (see below) is becoming another part of the IPP toolbox.
Link http://ec.europa.eu/environment/ipp/home.htm

6.7 The European Union Eco-label Scheme

EU eco-label scheme is a voluntary scheme designed to encourage businesses to market environmentally friendly products and services for European consumers, both public and private purchasers, by more easily identifying them. Eco-labelled (non-food) products are marked with the EU Flower, found throughout the European Union as well as in Norway, Liechtenstein and Iceland. The EU eco-label scheme is based on Regulation 1980/2000/EC and run by the European Union Eco-labelling Board (EUEB).

The eco-label is a rapidly growing brand, covering today both services and products in close to 30 product categories. An individual product must comply with all criteria (key, best practice and performance) in order to be awarded the EU Eco-label. Ecological criteria for a product group are normally established for a period of three years. This allows for technical improvements and changes in the market to be reflected when criteria are revised.
Link http://ec.europa.eu/environment/ecolabel/index_en.htm

6.8 Greening Standardisation

European and international standards are gaining increasing importance as a tool to support European policies and legislation, based upon the model of technical harmonisation introduced in EU in 1987. Within this approach, legislation sets the legal performance-oriented framework and objectives, whereas the detailed technical specifications for implementation are addressed in standards. Compliance with the standards remains voluntary.

European standardisation offers great potential to advance the protection of our environment (COM (2004) 674). It supports the energy efficiency of electrical products, the recyclability of products and the environmental impacts of buildings. One example is the European Committee for Electrotechnical Standardization, CENELEC, which since December 2006 offers an environmental database online. The database assists in environmental issues, and serve as a knowledge base for standards writers and stakeholders to systematically identify areas for improvement of the environmental profile of standards.
Link http://ec.europa.eu/environment/standardisation/index_en.htm

6.9 Green Public Procurement

Green public procurement means that public purchasers take account of environmental factors when buying products, services or works. Public procurement accounts for around 16% of the EU's GDP. As such it represents a potentially powerful economic driver to further the uptake of environmental technologies.

Two directives clarify, simplify and modernise existing European legislation on public procurement. Directive 2004/18 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts and Directive 2004/17 on the coordination of procurement procedures of entities operating in the water, energy, transport and postal services sector. The Directives explain a broad range of issues connected to Green Public Procurement.

Performance clauses of a public procurement contract may include environmental considerations. The Public Procurement Directives explicitly state that performance or functional requirements can be taken from specifications of European, international and national eco-labels. The purchasing authority can decide to recognise an eco-label as proof of compliance, but it also has to accept other means of proof of compliance with the specifications. In certain contracts, the authority may even ask for EMS certification or a comparable scheme. A purchasing officer can choose the bid offering the lowest price or 'the economically most advantageous offer, which may refer to environmental sub-criteria.

The green procurement conditions are relevant to the private sector as provider to the public sector. In the private sector corresponding issues are included in *supply chain management*. Here there are wide possibilities to select providers. However the request that a supplier has been certified according to an environmental management system is becoming very common, not the least due to customers pressure.
Link http://ec.europa.eu/environment/gpp/index_en.htm

6.10 Environmental Technologies Action Plan, ETAP

Environmental Technologies Action Plan, ETAP, is the Unions programme to support environmental technology development. Since 2004 ETAP covers a spectrum of actions to promote eco-innovation and encourage industry to develop and take up environmental technologies.

The *European Forum on Eco-Innovation* mobilises relevant players from business, finance, and technology development,

and provides a platform to move the innovation process and take inventions out of laboratories and onto the market.

Technology platforms are public/private partnerships on specific topics bring together all the interested stakeholders to build long-term visions to promote a specific technology or solve a particular issue. Areas addressed include Hydrogen and Fuel Cells, Photovoltaics, Steel, and Water supply and sanitation.

Networks of testing centres (Eurodemo, Promote, Testnet, Airtv) establish a mechanism to validate objectively the performance of new products and develop common or co-ordinated protocols and practices, a service especially important for SMEs.

Setting Performance targets that are long-term and visionary is important to encourage industry to take up environmental technologies. EU-activities related to Performance Targets include the Integrated Product Policy, the EuP Directive, the IPPC Directive, the EU Eco-Label, Environmental Products Declaration and national experiences in the field of eco-design, and EMAS, many to be described below.

The *financial instruments* to support investments in environmental technologies range from classical loans through guarantee mechanisms to venture capital, in addition to the Framework-Programme on Research and Development and the demonstration and investment programmes, such as LIFE-Environment, and the Structural Funds.

A new *Competitiveness and Innovation Programme* (CIP) will address eco-innovation, by stimulating the wider use of eco-efficient technologies, and by helping to bridge market gaps in SME finance.

ETAP promotes *Awareness Raising and Training* activities in conjunction with the development and take-up of environmentally friendly technologies.

Link http://ec.europa.eu/environment/etap/index_en.htm

7. LAND USE, NATURE PROTECTION, AND SOIL

7.1 Land Use and Spatial Planning

Land use policy covers a series of environmentally important issues such as infrastructure development including roads, railways, bridges, etc.; rural development with forestry and agriculture; urban development including building and traffic planning; coastal zone development and management.

The most important legal instrument in this sector is the *Environmental Impact Assessment*, EIA, with the intention to assure that environmental consequences of a development are carefully scrutinised before it starts. It is especially important that alternative development options, including the zero option – no development – is included in the assessment. More recently the Strategic Environmental Assessment, SEA, has been introduced to broaden the number of projects which will be assessed and also broaden the aspects considered, especially to social and economic aspects. EIA or SEA is legally required in most development projects in the Union.

Land use requires a *land use development plan*, normally legally established by the local authority. The plan defines which kind of activity can be allowed on different parts of the land and is the background for municipal decision on permits for the development of industry, residential areas, etc.

The development of land use is also addressed by the European Spatial Development Perspective (ESDP) document from 1999. This document was introduced to create a common framework for spatial planning in the Union. Its scope, wider than just environmental concerns, includes economic, social and cultural issues, as the basis for spatial management.

7.2 Environmental Impact Assessment

Environmental assessment is a procedure that ensures that the environmental implications of decisions are taken into account before the decisions are made. The process involves an analysis of the likely effects on the environment, recording those effects in a report, undertaking a public consultation exercise on the report, taking into account the comments and the report when making the final decision and informing the public about that decision afterwards.

In principle, environmental assessment can be undertaken for individual projects such as a dam, motorway, airport or a factory ('Environmental Impact Assessment') or for plans, programmes and policies ('Strategic Environmental Assessment').

The *EIA Directive* on Environmental Impact Assessment of the effects of projects on the environment was introduced in 1985 (Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment) and was amended in 1997 (Council Directive 97/11/EC). The EIA Directive outlines which project categories shall be made subject to an EIA, which procedure shall be followed and the content of the assessment.

Following the signature of the Aarhus Convention by the Community in June 1998, the Community adopted in May 2003 Directive 2003/35/EC amending amongst others the EIA Directive. This Directive aligns the provisions on public participation in accordance with the Aarhus Convention on public participation in decision-making and access to justice in environmental matters.

Other pieces of EU-legislation are related to the EIA Directive. This includes the IPPC Directive on the licensing of industrial sites, the SEVESO Directive on preventing chemical accidents and the EMAS Regulation on environmental man-

agement. An IMPEL report shows the interrelation between EIA, IPPC, SEVESO Directives and the EMAS Regulation
Link http://ec.europa.eu/environment/eia/eia-legalcontext.htm

7.3 Strategic Environmental Assessment

SEA Directive (Directive 2001/42/EC), effective from July 2004, assures that a wide range of plans and programmes begun after July 2004 now require an environmental assessment.

The purpose of the SEA Directive is to ensure that environmental consequences of certain plans and programmes are identified and assessed during their preparation and before their adoption. The public and environmental authorities can give their opinion and all results are integrated and taken into account in the course of the planning procedure. After the adoption of the plan or programme the public is informed about the decision and the way in which it was made. In the case of likely transboundary significant effects the affected Member State and its public are informed and have the possibility to make comments which are also integrated into the national decision-making process.
Link http://ec.europa.eu/environment/eia/sea-legalcontext.htm

7.4 Nature Protection and Biodiversity

Two EU Directives deal with the conservation of European wildlife, focusing on the protection of sites as well as species.

Council Directive 79/409/EEC on the conservation of wild birds, the *Birds Directive*, identified 193 endangered species and sub-species for which the Member States are required to designate Special Protection Areas (SPAs). Over 4,000 SPAs have been designated to date, covering 8% of EU territory. As a result of this action, some severely threatened species are now beginning to recover.

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, the *Habitats Directive*, aims to protect other wildlife species and habitats. Each Member State is required to identify sites of European importance and to put in place a special management plan to protect them, combining long-term conservation with economic and social activities, as part of a sustainable development strategy.

These sites, together with those of the Birds Directive, make up the Natura 2000 network – the cornerstone of EU nature protection policy. The Natura 2000 network, implemented during 2004-2006, already comprises more than 18,000 sites, covering over 17% of EU territory, was completed for EU 15. The *Natura 2000 Networking Programme* will create a series of training events, workshops and practical tools to promote Natura 2000, good practice in site management and the benefits of networking, across Europe.
Link http://ec.europa.eu/environment/nature/home.htm

7.5 Proposal for a Framework Directive on Soil

In response to concerns about the degradation of soils in the EU the Commission published in April 2002 a Communication ”Towards a Thematic Strategy for Soil Protection”. This was the first occasion on which the Commission has addressed soil protection for its own sake. It outlined the first steps to the development of a Thematic Strategy to protect soils in the European Union. It consists of a Communication from the Commission (COM(2006) 231), a proposal for a framework Directive, and an Impact Assessment.

The Communication gives the background for a high level of soil protection, and the Strategy and explains what kind of measures must be taken in a ten-year work program. The proposed framework Directive (COM(2006) 232) sets out common principles for protecting soils. The Impact Assessment (SEC (2006) 1165 and SEC(2006) 620) contains an analysis of the economic, social and environmental impacts of the different options that were considered in the preparatory phase of the strategy and of the measures finally retained by the Commission.
Link http://ec.europa.eu/environment/soil/index_en.htm

8. NOISE

8.1 The Directive on Environmental Noise

Noise is an environmental problem in all EU Member States This includes industrial noise, aircraft noise, road traffic noise, railway noise, and related emission data. Directive 2002/49/EC, the *Directive on Environmental Noise* of June 2002, has as the main aim to provide a common basis for tackling the noise problem across the EU. The underlying principles are similar to those for other overarching environment policy directives:

Monitoring the environmental problem; by requiring competent authorities in Member States to draw up ”strategic noise maps” for major roads, railways, airports and agglomerations, using harmonised noise indicators. These maps will be used to assess the number of people annoyed and sleep-disturbed respectively throughout Europe.

Informing and consulting the public about noise exposure, its effects, and the measures considered to address noise, in line with the principles of the Aarhus Convention.

Addressing *local noise issues* by requiring competent authorities to draw up action plans to reduce noise where necessary and maintain environmental noise quality where it is good.

The directive does not set any limit value, nor does it prescribe the measures to be used in the action plans, which remain at the discretion of the competent authorities. These are partly specified in a series of detailed regulations (see below).

The European Environment Agency is preparing an electronic reporting mechanism aimed at helping Member States report their data in compliance with Directive 2002/49/EC.

The Commission is developing a *long-term EU strategy*, which includes objectives to reduce the number of people affected by noise in the longer term, and provides a framework for developing existing Community policy on noise reduction from source. With this respect, the Commission has made a declaration concerning the provisions with regard to the preparation of legislation relating to sources of noise.
Link http://ec.europa.eu/environment/noise/directive.htm

8.2 Existing Directives Relating to Noise Sources

There are a number of directives and other pieces of legislation regarding noise from cars, aircrafts, boats, industrial production and so on.

Road traffic noise is addressed in Council Directive 70/157/EEC "on the approximation of the laws of the Member States relating to the permissible sound level and the exhaust system of motor vehicles".

Railway noise and the Interoperability of the Trans-European high-speed rail system are addressed in several regulations. The 1996 regulation (96/48/EC) is general. Technical specification for interoperability (TSI) relating to high-speed rolling stock was regulated in the Commission Decision 2002/735/EC and the Technical specification for interoperability (TSI) relating to high-speed railway infrastructures is addressed by the Commission Decision 2002/732/EC. There are several amendments to these regulations.

There are a number of regulations addressing Noise from Equipment for Use Outdoors (2000/14/EC) and for Miscellaneous Recreational Craft Noise (2003/44/EC). The Commission has adopted in August 2003 guidelines on the revised interim computation methods for industrial noise, aircraft noise, road traffic noise and railway noise, and related emission data.
Link http://ec.europa.eu/environment/noise/sources.htm

9. WASTE

9.1 Strategies and Framework Directives on Waste

Waste is a main environmental concern within the European Union. The amount of waste produced is still increasing, although substantial efforts to increase recycling have been made. The reasons for concern are two-fold: first the environmental and health impacts of waste, secondly the fact that wastization is poor resource management.

As part of the 6th Environmental Action Plan the European Commission proposed in December 2005 a new *strategy on the prevention and recycling of waste*. This strategy is one of the seven key environmental thematic strategies of the Union. It aims to help Europe become a recycling society that seeks to avoid waste and use waste as a resource. It will draw on the knowledge that the *thematic strategy on resource* adopted at the same time.

The first EEC *Waste Directive* was adopted in 1975. A new *codified* Waste Framework Directive (Directive 2006/12/EC) has now replaced the 1975 version, as a legal text that replaces all the previous versions and their amendments without any legal or political changes. In parallel the Commission has published a proposal for substantive revision of the Directive to merge, streamline and clarify the waste legislation and contribute to a better regulation (Waste COM(2005) 667 final). The European Parliament gave its first reading opinion on the revision in February 2007. The Commission has, as part of the process, encouraged the EU Member States to set recycling standards and develop national waste prevention programmes.

Waste central legislation include – in addition to the Framework Directive (2006/12/EC) – Directive 91/689/EEC on hazardous waste, Decision 2000/532/EC on establishing a list of waste, and Council Regulation (EEC) N° 259/93 on the supervision and control of shipments of waste within, into and out of the European Community. The Union has also adopted in a Council Decision 93/98/EEC the Convention on the control of transboundary movements of hazardous wastes and their disposal (Basel Convention).

Along series of special Directives and their secondary legislation regulates waste management within a long list of sectors. Below follow short descriptions and proper links to most of these regulations.
Link http://ec.europa.eu/environment/waste/strategy.htm
Link http://ec.europa.eu/environment/waste/legislation/a.htm

9.2 The Landfill Directive

The Landfill Directive (Council Directive 99/31/EC on the landfill of waste) aims to prevent or reduce as far as possible negative effects on the environment from the land-filling of waste in particular on surface water, groundwater, soil, air and human health. The directive is unusually detailed and introduces stringent technical requirements for waste and landfills. In this way it plays the role of defining the BAT for landfills (There is no BREF for landfills).

The directive applies to all landfills, defined as waste disposal sites for the deposit of waste onto or into land, and includes all waste categories. Landfills are divided into three classes: landfills for hazardous waste, for non-hazardous waste, and for inert waste.

The acceptance of waste at each landfill class is described in Annex II of the directive. Waste must be treated before being

landfilled and hazardous waste must be assigned to a hazardous waste landfill. Municipal waste should be sent to landfills for non-hazardous waste, and inert waste to an inert waste landfill. Liquid waste, flammable waste, explosive or oxidising waste, hospital and other clinical waste which is infectious is not accepted in a landfill at all. Nor are used tyres, with certain exceptions.

A number of large-scale operations are *not* included in the Directive. This includes the spreading of sludge, including sewage sludge, on soil, inert waste for redevelopment or restoration work, the deposit of unpolluted soil or of non-hazardous inert waste from prospecting and extraction, mineral resources from operation of quarries; non-hazardous dredging sludge alongside small waterways, and of non-hazardous sludge in surface water.

The Directive requests an operating permit for landfill sites. Applications for permits must contain information on types and total quantity of waste, capacity, site description, methods for pollution prevention and abatement, operation, monitoring and control plan, and a plan for closure and aftercare procedures. An impact assessment study is also required.

In addition a landfill above a certain size requires an IPPC permit to operate.

Landfills serving islands have less stringent regulations if they only accept non-hazardous or inert wastes from that island, and has a total capacity not exceeding 15 000 tonnes or with an annual intake not exceeding 1 000 tonnes.

Link http://ec.europa.eu/environment/waste/landfill_index.htm

9.3 Biodegradable Waste

The main environmental threat from *biowaste* is the production of methane in landfills. This accounted for some 3% of total greenhouse gas emissions in the EU-15 in 1995. The Landfill Directive 1999/31/EC obliges Member States to reduce the amount of biodegradable waste that they landfill to 35% of 1995 levels by 2016, which will significantly reduce the problem.

There are several alternative *treatment methods* for biodegradable waste. The Commission will provide criteria, in the form of a guidance document, to help identify the environmentally best option for the management of biowaste. Member States will be required to report their treatment choices in their national waste management plans (draft Waste Framework Directive). The environmentally sound management of biowaste will be addressed in the Thematic Strategy on waste prevention and recycling in 2010.

Quality standards for *compost* are planned in the revised Waste Framework Directive. The intention is to develop a market for compost, and overcome one of the biggest obstacles to composting policies, the lack of user confidence and market acceptance. Environmental standards for facilities in which biological treatment takes place will be addressed in a review of the IPPC Directive for licensing major industrial and agricultural installations based on the Best Available Techniques (BAT). The Thematic Strategy on Soil will address the wider subject of carbon depletion in soil, which includes the use of compost as a means to increase the carbon content of soil.

The Commission is preparing guidelines on the application of life cycle thinking to biowaste management policies. Updated information can be found at the JRC website devoted to the *European life cycle thinking guidelines for the management of municipal biodegradable waste*. The final document will be the first guidance document developed at European level on applying life cycle thinking to waste management policies.

Link http://ec.europa.eu/environment/waste/compost/index.htm

9.4 Mining Waste

The pollution of Danube river caused by a cyanide spill following a damburst of a tailings pond in Baia Mare, Romania in 2000 and the 1998 accident in Aznalcóllar, Spain where a damburst poisoned the environment of the Coto Doñana National Park, have increased public awareness of the environmental and safety hazards of mining activities. These accidents, like other similar ones, have illustrated the significant environmental and health risks associated with the management of mining waste.

In October 2000, the Commission adopted a Communication asking for an amendment of the Seveso II Directive to include mineral processing of ores, tailings ponds or dams used in mineral processing of ores. It is also preparing a BREF document of waste management to reduce everyday pollution and to prevent or mitigate accidents in the mining sector.

Finally a directive on the management of mining waste was adopted. Directive 2006/21/EC on the management of waste from the extractive industries stipulates measures, procedures and guidance to prevent or reduce as far as possible any adverse effects on the environment, in particular water, air, soil, fauna and flora and landscape, and any resultant risks to human health, brought about as a result of the management of waste from the extractive industries. It requests Member States to ensure that the operator draws up a waste management plan for the minimisation, treatment, recovery and disposal of extractive waste.

Link http://ec.europa.eu/environment/waste/mining/index.htm

9.5 Waste Incineration Directive

Directive 2000/76/EC on the incineration of waste, the *WI Directive*, aims to prevent or to reduce as far as possible negative effects on the environment caused by the incineration and co-incineration of waste. It replaces the former directives on the incineration of hazardous waste (Directive 94/67/EC) and non-

hazardous waste (Directives 89/369/EEC and 89/429/EEC). It asks for the reduction of pollution caused by emissions into the air, soil, surface water and groundwater through the application of operational conditions, technical requirements, and emission limit values for waste incineration and co-incineration plants. The Directive does not include some plants, e.g. those treating only biomass, such as non-treated agriculture and forestry residues.

The WI Directive makes a clear distinction between incineration plants (which are dedicated to the thermal treatment of waste and may or may not recover heat generated by combustion) and co-incineration plants (such as cement kilns, steel or power plants whose main purpose is energy generation or the production of material products).

The WI Directive sets controls on releases to water, and emissions to air for NO_X, SO_2, HCl, heavy metals, particles, and dioxins and furans. It provides for public consultation, access to information and participation in the permitting procedure.

Other EU regulations and Commission documents that are relevant to the waste incineration sector include

- IPPC Directive, as many of the plants covered by the WI Directive are also covered by this directive. In these cases, the WI Directive only sets minimum obligations, which are not necessarily sufficient to comply with the IPPC Directive.
- LCP Directive (Directive 2001/80/EC on large combustion plants), which regulates the emissions of acidifying pollutants, particles, and ozone precursors from large (above 50 MW) combustion plants. The LCP Directive encourages the combined generation of heat and power and sets specific emission limit values for the use of biomass as fuel.
- VOC Solvents Directive (Directive 1999/13/EC), which regulates industrial emissions of volatile organic compounds (VOCs). The VOC Solvents Directive establishes emission limit values for VOCs in waste gases.
- Directive 1999/32/EC regulating the combustion of certain types of sulphur containing liquid fuels to reduce the emissions of sulphur dioxide.

Details of emissions from waste incineration plants and other industrial sources can be accessed via the European Pollutant Emission Register (EPER)
Link http://ec.europa.eu/environment/air/stationary.htm

9.6 Disposal of Waste Oils

The EU consumed in 2003 roughly 4.4 million tonnes a year of lubricant oils, such as lubricant oils for vehicles, turbines, gearboxes and engines, hydraulic oils, etc. Some 50% of this became waste oils (the rest is lost during use, or through leakages, etc.), which leaves us with approximately 2.5 million tonnes of waste oil to manage every year. Waste oils are hazardous waste. Waste oils leaking into rivers, lakes and streams threaten aquatic life, and severe soil contamination can result from waste oils being left on the ground.

According 2003 data almost 2 million tonnes of waste oils in EU were collected, giving a collection rate of 81%. Out of this amount, 44% was regenerated while 46% was combusted. That is, 20% of this oil is still illegally dumped or burnt.

The Waste Oil Directive 75/439/EEC, as last amended by Directive 2000/76/EC, was designed to create a harmonised system for the collection, storage, recovery and disposal of waste oils and protect the environment against the harmful effects of illegal dumping and of treatment operations. The Directive applies to any mineral-based lubrication or industrial oils which have become unfit for their original use. It requires that waste oils are collected and disposed of by processing, destruction, storage or tipping above or under ground. The processing of waste oils by regeneration, i.e. by refining, should be given priority.

Any undertaking, which collects waste oils, must be subject to registration and national supervision, including possibly a system of permits. The mixing of waste oils with polychlorinated biphenyls or terphenyls (PCBs and PCTs) or with toxic and dangerous wastes is not allowed.
Link http://ec.europa.eu/environment/waste/oil_index.htm

9.7 The Disposal of PCBs and PCTs

Polychlorinated biphenyls and polychlorinated terphenyls (PCBs/PCTs) are persistent and toxic man-made chemicals. PCBs were commercially produced world-wide on a large scale between the 1930´s and 1980´s. Given their extraordinary chemical stability and heat resistance, they were extensively employed as components in electrical and hydraulic equipment, such as transformers, capacitors, heat transfer and hydraulic systems; and in open applications: as pesticide extenders, sealant, carbonless copy paper, industrial oils, paints, adhesives, plastics, flame retardants and to control dust on roads.

In the 1970´s, when their human toxicity, suspected carcinogenicity, and environmental persistence, and a wide spectrum of adverse effects in animals and humans became known, several countries limited the use of PCBs. Finally in 1985, the use and marketing of PCBs in the European Community were very heavily restricted.

The very stable PCBs still exits in large amounts in the infrastructure of our society and for this reason is a main concern especially when managing building and industrial/equipment waste. Directive 96/59/EC on the disposal of PCBs and

PCTs aims at disposing completely of PCBs and equipment containing PCBs as soon as possible, and for big equipment before the end of 2010.

The directive sets the requirements for an environmentally sound disposal of PCBs. Member States have to make an inventory of big equipment containing PCBs, have to adopt a plan for disposal of inventoried equipment, and outlines for collection and disposal of non inventoried equipment (small electrical equipment very often present in household appliances manufactured before the ban on marketing of PCBs).

Furthermore, the Commission has adopted a Community Strategy on Dioxins, Furans and PCBs aimed at reducing as far as possible the release of these substances in the environment and their introduction in the food chains. As regulation No 850/2004/EC on persistent organic pollutants also covers PCB, the Commission has carried out a study to facilitate the implementation of the waste related provisions of this regulation.
Link http://ec.europa.eu/environment/waste/pcbs/index.htm

9.8 Disposal of End-of-Life Vehicles

Every year, end of life vehicles generate between 8 and 9 million tonnes of waste in the Union. In 1997, the Commission proposed a Directive which aims at making vehicle dismantling and recycling more environmentally friendly, sets clear quantified targets for reuse, recycling and recovery of vehicles and their components and pushes producers to manufacture new vehicles also with a view to their recyclability. This legislation was officially adopted in September 2000 as Directive 2000/53/EC – *the ELV Directive*. Based on an Impact Assessment the Commission adopted in 2007 a report on the targets ("2015 targets") of the ELV Directive.

The Commission have developed a Guidance Document on the legislative acquis which, even though it is not legally binding, aims at facilitating the implementation of the ELV Directive and its secondary legislation at national level.

The ELV Directive was amended with a series of detailed instructions. The Council Decision 2005/673/EC amended the Annex II; Commission Decisions 2005/437/EC and 2005/438/EC regulate the management of vehicles spare parts. The Netherlands' waste disposal system for car wrecks is adopted in Commission Decision 2002/204/EC. Directive 2005/64/EC regulates the type-approval of motor vehicles with regard to their reusability, recyclability and recoverability and amends Council Directive 70/156/EEC.
Link http://ec.europa.eu/environment/waste/elv_index.htm

9.9 Packaging and Packaging Waste

Packaging waste in the EU is a large and increasing concern. The 2002 average EU-15 amount of waste was 172 kg/capita and year. Between 1997 and 2002 the growth in packaging waste generation in the EU-15 almost followed the growth in GDP: waste increased by 10% and GDP by 12.6%. There are large variations ranging from 87 kg/capita in Finland to 217 kg/capita in Ireland (2002), partly explained by differing definitions of packaging. Only the UK, Denmark and Austria reduced their per capita generation of packaging waste since 1997.

The first introduced directive on the management of packaging waste (Directive 85/339/EEC) regarding liquid beverage containers was too vague to achieve effective market harmonisation. A new *Directive on Packaging and Packaging Waste* (Directive 94/62/EC) was adopted in 1994. It aims to harmonise national measures in order to prevent or reduce the impact of packaging and packaging waste on the environment and to ensure the functioning of the Internal Market. It contains provisions on the prevention of packaging waste, on the re-use of packaging and on the recovery and recycling of packaging waste. The directive was amended by a series of secondary packaging legislation regulating the identification of packaging materials, reports of the directives, the database system, and the conditions for derogation of plastic crates, plastic pallets, and glass packaging.

The (prolonged) implementation of the directive in the new Member States is regulated by Directive 2005/20/EC.
Link http://ec.europa.eu/environment/waste/packaging/events.htm

9.10 Waste Electrical and Electronic Equipment, WEEE Directive

A fast increasing waste stream of electrical and electronic equipment, reflects the increased amounts of TV sets, computers, sound equipments and the like used in our societies. Directives 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment and Directive 2002/96/EC on waste electrical and electronic equipment are designed to tackle the fast increasing waste stream of electrical and electronic equipment and complements measures on landfill and incineration of waste. Together they constitute the *waste electrical and electronic equipment (WEEE) Directive*.

Increased recycling will limit the total quantity of waste going to final disposal. Therefore, through the directives, producers are responsible for taking back and recycling electrical and electronic equipment. This provides incentives to design electrical and electronic equipment in an environmentally more efficient way, which takes waste management aspects fully into account. Consumers will be able to return their equipment free of charge.

In order to prevent the generation of hazardous waste, Directive 2002/95/EC requires the substitution of various heavy

metals (lead, mercury, cadmium, and hexavalent chromium) and brominated flame retardants (polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE)) in new electrical and electronic equipment put on the market from 1 July 2006.

Directive 2003/108/EC amends Directive 2002/96/EC. A number of additional legislation has been developed to detail the restriction on the use of certain hazardous substances in electrical and electronic equipment.

Link http://ec.europa.eu/environment/waste/weee/index_en.htm

9.11 Disposal of Batteries and Accumulators

Directive 91/157/EEC on batteries and accumulators containing dangerous substances regulates the waste of batteries containing mercury, lead and cadmium. Directive 2006/66/EC, (now under implementation for all batteries and accumulators) aims at minimising the negative impacts of batteries and accumulators on the environment and also harmonising requirements for the smooth functioning of the internal market. It prohibit the marketing of some batteries containing hazardous substances and contains measures for a high level of collection and recycling of batteries with quantified collection and recycling targets.

The Directive sets out minimum rules for producer responsibility and provisions with regard to labelling of batteries and their removability from equipment. Producers must arrange financing for the collection, treatment, recycling and sound disposal of all types of collected spent batteries with a view to recycling their raw materials for use in the manufacture of new products. The cost of collecting portable batteries may be shared among producers and national, regional and local authorities. All batteries and accumulators must bear the symbol indicating separate collection (a crossed-out wheeled bin as depicted in Annex II to the proposal).

Link http://ec.europa.eu/environment/waste/batteries/index.htm

9.12 Waste Management Planning

Waste management planning is the cornerstone of any national, regional or local policy on waste management. The establishment of a plan allows the operator to take stock of the existing situation, to define the objectives that need to be met in the future, to formulate appropriate strategies, and identify the necessary implementation means.

The drawing up of waste management plans is required by Directive 2006/12/EC, which sets out the general requirement. Specific provisions for hazardous waste are found in Article 6 of Directive 91/689/EEC and for packaging and packaging waste in Article 6 of Directive 94/62/EC.

To assist national, regional and local competent authorities when preparing waste management plans, the Commission has published a methodological guidance. It should promote more coherent and appropriate planning practices in the Member States in compliance with the requirements of relevant EU legislation.

Link http://ec.europa.eu/environment/waste/plans/index.htm

9.13 Waste Shipments

Economic growth and globalization have led to a worldwide increase of waste transports across borders, whether on the road, by railway or ship. These waste movements or *shipments* sometimes involve hazardous wastes and can create risks for human health and the environment. In other cases wastes are traded to replace natural resources in industrial facilities with high environmental standards.

In order to control waste shipments, certain procedures and requirements have been introduced in international and EU law. These include Regulation (EC) 1013/2006 on shipments of waste and shipments of "green-listed" non-hazardous wastes to non-OECD countries; and Regulation (EC) 1420/1999 establishing common rules and procedures for shipments to certain non-OECD countries of certain types of waste. Special provisions for waste shipments apply to several of the new Member States, including Latvia, Poland and Slovakia.

Decision 93/98/EEC introduces in the EU the Convention on the control of transboundary movements of hazardous wastes and their disposal (Basel Convention); and Commission Decision 94/774/EC amends Council Regulation (EEC) No 259/93 on the supervision and control of shipments of waste within, into and out of the European Community.

Some types of waste shipments are covered by specific legal regimes; in particular Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues, and Directive 2006/117/EURATOM on the supervision and control of shipments of radioactive waste and spent fuel.

Link http://ec.europa.eu/environment/waste/shipments/index.htm

10. WATER

10.1 The Water Framework Directive

Cleaner rivers and lakes, groundwater and coastal beaches are of high priority in European Environmental policy. Early European water legislation led in the 1980's up to binding quality targets for drinking water and quality objectives for fish and shellfish waters, bathing waters and groundwater. A second phase of water legislation culminated in 1991 with the adoption of the Urban Waste Water Treatment Directive, and the Nitrates Directive, which addressed water pollution by nitrates from cities and agriculture. A fundamental rethink of Community water policy, asking for a more integrated approach, culminated in mid-1995. A new European water policy and

framework legislation to reach "good status" of surface waters and groundwater developed on a river basins approach. A Directive to introduce *integrated river basin management* for Europe, Directive 2000/60/EC, the *EU Water Framework Directive* (WFD) was finally adopted in 2000.

The framework directive approach rationalises the Unions water legislation by replacing seven of the "first wave" directives on surface water, measurement methods, the fish and shellfish water, groundwater; and dangerous substances discharges. Still a number of *specific regulations* are left to tackle particular pollution problems. Key examples are the Urban Waste Water Treatment Directive and the Nitrates Directive, which together tackle the problem of eutrophication; and the IPPC Directive, which deals with chemical pollution from industries. The Groundwater Directive corresponds to Article 17 of WFD, and Decision 2455/2001/EC to the list of priority substances asked for in Article 16 of the WFD. The objectives of "good ecological status" is addressed by an intercalibration process comparing national classifications, and Decision 2005/646/EC sets out a network of intercalibration sites. The results of this process are expected to be published in late 2007.

Historically, there has been a dichotomy of water pollution control: *source control* and *quality standards*. Source controls alone can allow a cumulative pollution load, where there is a concentration of pollution sources, while quality standards can underestimate the effect of a particular substance on the ecosystem. For this reason, a consensus has developed that both are needed in practice. The Water Framework Directive formalises this. On the source side, it requires that all existing technology-driven source-based controls must be implemented as a first step. But it also includes the development of a list of priority substances for action at EU level, and the design of the most cost-effective set of measures to achieve load reduction of those substances.

On March 2007, the Commission organised a conference where more than 400 participants reviewed the first WFD implementation report and launched a Water Information System for Europe (WISE).

Link http://ec.europa.eu/environment/water/water-framework/index_en.html

10.2 River Basin Management

The Water Framework directive requires management by river basin – the natural geographical and hydrological unit – instead of according to administrative or political boundaries. For each river basin district, some of which will traverse national frontiers, a *river basin management plan* is requested, and a *River Basin Authority* needs to be established. The key objectives are protection of the aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water. *Good ecological status* and *good chemical status* are asked for but without absolute standards, only referring to *minimal anthropogenic impact*. The effect on each body of water of full implementation of all existing legislation is considered. If the existing legislation solves the problem the objective of the framework Directive is attained.

The role of citizens and citizens' groups will be crucial. To arrive at decisions to achieve the objectives in the river basin management plan will involve balancing the interests of various groups. The economic analysis requirement is intended to provide a rational basis for this, but it is essential that the process and the implementation of the legislation are open to those living in the basin. The Water Framework Directive requires information and public consultation alongside when river basin management plans are established.

Flood protection and essential drinking water supply is dealt with by providing derogations from the requirement to achieve good status for these cases. Less clear-cut cases are navigation and power generation, where the activity is open to alternative approaches.

As to pollution the precautionary principle provides the basis. A few chemical quality standards have been established for particular substances (nitrates, pesticides and biocides), and these must always be adhered to. Groundwater should not be polluted at all. Quantity is also a major issue for groundwater. For good management, the Directive limits abstraction only to that portion of the overall recharge, which is not needed by the ecology.

The first river basin management plans should be ready by 2009 and then revised each six years.

Link http://ec.europa.eu/environment/water/index_en.htm

10.3 Drinking Water Directive

Directive 98/83/EC, the Drinking Water Directive (DWD), concerns the quality of water intended for human consumption. The objective of the Drinking Water Directive is to protect the health of the consumers in the European Union and to make sure the water is wholesome and clean. Member States have to monitor the quality of the drinking water supplied to their citizens at the tap and of the water used in the food production industry, and report the results every three years.

The Drinking Water Directive sets standards for the most common substances that can be found in drinking water. A total of 48 microbiological and chemical parameters must be monitored and tested regularly. In principle WHO guidelines for drinking water are used as a basis for the standards.

In order to adapt the Directive to progress in science and technology and to address the changed context met after the enlargement of the Union, the Commission is currently (2007) preparing a revision of the Directive addressing bacteriological contamination, chemical substances including construction products in contact with drinking water, small water supplies and risk assessment and risk management.

The concept of risk assessment and risk management during the production and distribution of drinking water was introduced by WHO in the 2004 Guidelines for Drinking Water Quality. This concept was introduced in the context the European Water Safety Plans.

Link http://ec.europa.eu/environment/water/water-drink/index_en.html

10.4 Urban Waste Water Treatment, UWWT Directive

Directive 91/271EEC concerning urban wastewater treatment aims to protect the water environment from the adverse effects of discharges of urban wastewater and from certain industrial discharges, and secure an environmentally sound reuse or disposal of sewage sludge. Directive 98/15/EC was amended to UWWT Directive to clarify the requirements on discharges from urban wastewater treatment plants to sensitive areas which are subject to eutrophication.

Secondary (biological) treatment is the basic level, which should be provided everywhere. All discharges from agglomerations with more than 10,000 person equivalents (p.e.) within the catchments of sensitive water bodies shall, however, have sewage collecting systems and wastewater treatment plants more stringent than secondary treatment. For discharges in coastal waters treatment may be less stringent (primary treatment) under certain conditions and subject to the agreement of the European Commission.

Member States should establish systems or authorisation for all discharges of urban wastewater, and industrial wastewater into urban sewage collecting systems, to ensure that no adverse effect on the environment (including receiving waters) will occur; and ensure the safe disposal of sewage sludge. For food processing industries and agglomerations with more than 2,000 p.e. the directive requires that collecting system and appropriate treatments are introduced. Member States should also protect receiving waters from pollution of storm water overflows via collecting systems under unusual situations, such as heavy rain.

Adequate co-operation and information exchange with other Member States has to be developed where discharges of wastewater have a transboundary effect on water quality of shared waters.

Link http://ec.europa.eu/environment/water/water-urbanwaste/index_en.html

10.5 Sewage Sludge

Sludge originates from the treatment of wastewater. Due to the physical-chemical processes, the sludge tends to concentrate heavy metals and poorly biodegradable trace organic compounds as well as potentially pathogenic organisms (viruses, bacteria etc) present in the wastewaters. Sludge is, however, rich in nutrients, such as nitrogen and phosphorous, and contains valuable organic matter that is useful when soils are depleted or subject to erosion.

The implementation of the Urban Waste Water Treatment Directive has increased the quantities of sewage sludge. From an annual production of some 5.5 million tonnes of dry matter in 1992, the Community will have an estimated 9 million tonnes by the end of 2005 in the EU-15, as the number of households connected to sewers and the level of treatment increases. Landfilling and incineration are the most widely used methods, despite their environmental drawbacks. The reuse of sludge accounts for about 40% of the whole.

The Sewage Sludge Directive (Directive 86/278/EEC) seeks to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to prevent harmful effects on soil, vegetation, animals and man. It prohibits the use of untreated sludge on agricultural land unless it is injected or incorporated into the soil. Treated sludge is defined as having undergone "biological, chemical or heat treatment, long-term storage or any other appropriate process so as significantly to reduce its fermentability and the health hazards resulting from its use". Sludge must not be applied to soil in which fruit and vegetable crops are growing or grown, or less than ten months before fruit and vegetable crops are to be harvested. Grazing animals must not be allowed access to grassland or forage land less than three weeks after the application of sludge. Spreading of sludge on surface waters is prohibited (WFD).

The Directive lays down limit values for concentrations of heavy metals in the soil and in sludge and the maximum annual quantities of heavy metals, which may be introduced into the soil. Several Member States have set concentration limits at levels below those in the Directive, and average concentrations of heavy metals in sludge used in agriculture are significantly lower than those specified in the Directive. Seven Member States reported using at least 50% of the sludge they generate in agriculture.

Link http://ec.europa.eu/environment/waste/sludge/index.htm

10.6 The Nitrates Directive

The EU has been taking measures to limit nitrogen pollution in waters for over twenty years. While the initial directives concerned themselves mainly with water for human consumption,

more recently legislation (e.g. the UWWT Directive) attempts more to limit eutrophication. Directive 91/676/EEC on nitrates from agricultural sources, called the *Nitrate Directive*, aims to reduce eutrophication caused by agriculture.

The directive requests that agricultural land, which significantly contribute to nitrogen pollution – so-called "vulnerable zones" (NVZs) – are identified and that Action Programs to reduce N pollution are established. The main types of actions that the Nitrates directive promotes include crop rotations; use of soil winter cover, that is catch crops in order to limit leaching during the wet seasons; use of fertilisers and manure, with a balance between crop needs; N inputs and soil supply, frequent manure and soil analysis, mandatory fertilisation plans and limitations per crop for both mineral and organic N fertilisation.

Good nitrate management is requested in this directive. It includes appropriate N spreading, sufficient manure storage and good spreading practices (less than 170 kg organic nitrogen/hectare/year), the use of buffer strips (grass strips and hedges) along watercourses and ditches, and the restriction of cultivation on steeply sloping soils and of irrigation.

Link http://ec.europa.eu/environment/water/water-nitrates/index_en.html

10.7 Priority Substances Under the Water Framework Directive

In July 2006, the Commission adopted a Directive setting environmental quality standards for priority substances, which Member States must achieve by 2015, to ensure "good chemical surface water status".

Article 16 of the Water Framework Directive (2000/60/EC) sets out a "Strategy against pollution of water". The first step of the strategy was the establishment of a list of priority hazardous substances to become Annex 10 of the Directive, adopted as final Decision (2455/2001/EC) in 2001. The list identifies 33 substances or group of substances, which have been shown to be of major concern for European Waters. 11 substances have been identified as priority hazardous substances, which will be subject to phasing out of discharges, emissions and losses within an appropriate timetable that shall not exceed 20 years. A further 14 substances were identified as being subject to review for identification as possible "priority hazardous substances".

Hazardous substances were also listed in Directive 76/464/EEC, later codified as 2006/11/EC, on pollution caused by certain dangerous substances discharged into the aquatic environment. The Directive introduced the concept of list I and list II substances. List I includes substances to be eliminated. It lists 132 pollutants selected on the basis of their persistence, toxicity and bioaccumulation. So far, 18 individual substances of the "candidate list I" have been regulated in five specific 'daughter' Directives. The 18 list I substances are given emission limit values in the IPPC directive as minimum requirements for large industrial installations.

List II includes substances, which should be reduced. It lists groups and families of substances that have a deleterious effect on the aquatic environment. It also contains all individual list I substances that have not been regulated, that is the other 114 substances of the 'candidate list I'. For the relevant pollutants of list II, Member States must establish pollution reduction programmes including water quality objectives according to Article 7 of the Directive 76/464/EEC. Progress in properly implementing list II substances that are regulated under Article 7 of the Directive has proved to be very slow, and the Commission has started a legal procedure.

Link http://ec.europa.eu/environment/water/water-dangersub/76_464.htm

Link http://ec.europa.eu/environment/water/water-dangersub/pri_substances.htm

10.8 Groundwater Directive

The new Groundwater Directive (2006/118/EC) establishes a regime, which sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater. The directive establishes quality criteria that takes account local characteristics and allows for further improvements to be made based on monitoring data and new scientific knowledge. The directive responds to the requirements of the Water Framework Directive (WFD). It requests assessments on chemical status of groundwater and the identification and reversal of significant and sustained upward trends in pollutant concentrations.

The groundwater directive requires groundwater quality standards to be established by the end of 2008. Pollution trends should be studied using so-called "baseline level" data obtained in 2007-2008, and prevent or limit inputs of pollutants into groundwater to allow environmental objectives – compliance with good chemical status criteria – to be achieved by 2015. As in the WFD the reviews of technical provisions of the directive should be carried out in 2013 and every six years thereafter.

Link http://ec.europa.eu/environment/water/water-framework/groundwater/policy/current_framework/new_directive_en.htm