



**Environmental
Factsheet No. 16**
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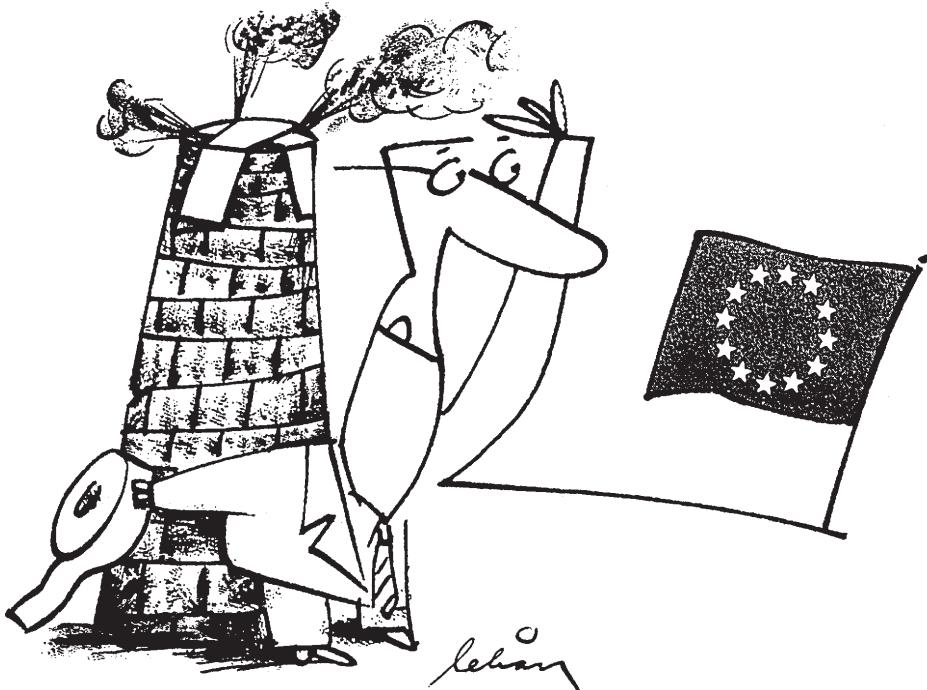
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EU LEGISLATION ON AIR POLLUTION



Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants

In June 1999 the European Commission presented a proposal for a directive setting national emission ceilings (NECs) for four air pollutants that cause acidification and the formation of ground-level ozone: sulphur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and ammonia (NH_3). After two years of negotiation, it was adopted by the Council of Ministers and the European Parliament in July 2001.

The aim of the directive is to gradually improve, through a stepwise reduction of the four pollutants, the protection both of human health and the environment throughout the EU. By means of EU strategies to combat acidification and ground-level ozone, the directive establishes interim en-

vironmental quality targets that are to be attained by 2010.

These targets constitute the first step towards the achievement of the long-term objectives of not exceeding the so-called critical loads,¹ and of effective protection of human health against risks from air pollution, as laid down in the Fifth Environmental Action Programme. This NEC directive is the key legislation for the achievement of those environmental objectives, as well as for attaining the EU air quality standards for a number of pollutants, including SO_2 , NO_2 , fine particles (PM_{10}), and ozone.

Background

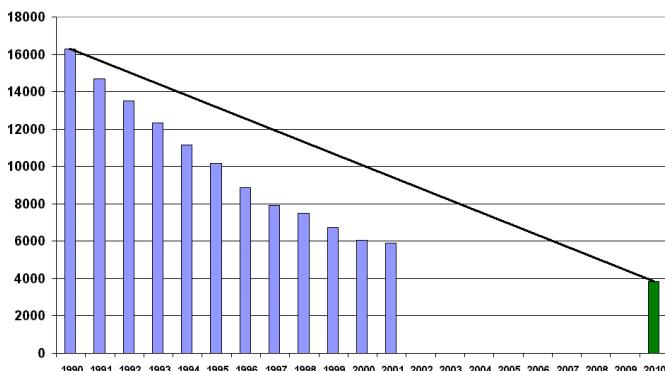
After its adoption of the acidification strategy in March 1997, the Commission spent

¹ Critical loads have been defined as: "The highest load that will not cause chemical changes leading to long-term harmful effects on the most sensitive ecological systems." It can be said that in a strict sense a critical load, according to that definition, is one that does not produce any effect on the most sensitive receptor even in the long term. Receptors may be individual species, types of soil, ecosystems, etc. For further info, see: www.acidrain.org/cl_fact.htm#Critical_loads.

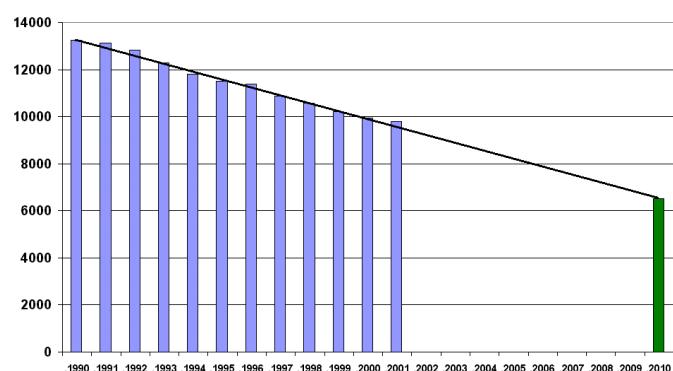
EU15 emissions 1990-2001, and emission ceilings for 2010.

Emissions in ktonnes. Source: Review and revision: Emission data reported to CLRTAP. EMEP MSC-W Report 2003.

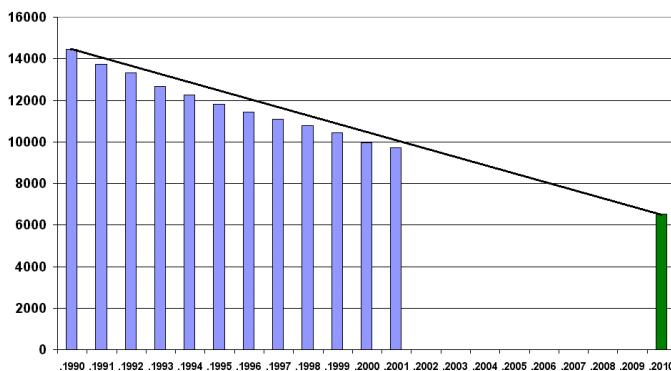
Sulphur dioxide



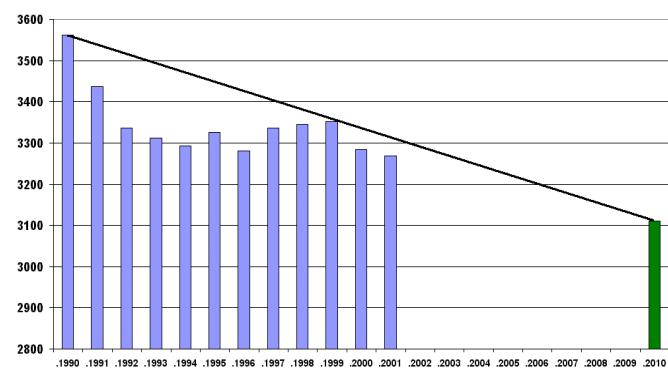
Nitrogen oxides



Volatile Organic Compounds



Ammonia



two years on thorough analysis in order to determine the ways by which the interim targets for ground-level ozone and acidification could be met at the lowest possible cost for the EU as a whole. This work was done with the RAINS computer model, the same as that used for many years by the Convention on Long-range Transboundary Air Pollution, for example when preparing and negotiating the 1999 Gothenburg Protocol. During this process of analysis, experts from member states, as well as from other stakeholders (including industry and environmental NGOs) were continuously being informed and consulted.

According to the Commission's original proposal from June 1999, the total emissions of sulphur dioxide in the EU should come down by 78 per cent, between 1990 and 2010. In the same time period, the emissions of nitrogen oxides should be reduced by 55 per cent, and those of volatile organic compounds and ammonia by 60 and 21 per cent respectively.

While the parliament gave unreserved

support to the Commission's proposed emission ceilings, most member states were not prepared to do so. After conciliation negotiations between parliament and the Council, the NECS in the resulting directive will mean less emission reductions: SO₂ will come down by 77 per cent, NO_x by 51 per cent, VOCs by 54 per cent, and ammonia by 14 per cent. Consequently there is great risk that the interim environmental targets for ozone and acidification will not be achieved, a fact that has been strongly criticised by environmental NGOs.

In most cases the emission ceilings of the directive do not deviate very much from those the EU member countries had already undertaken in 1999 by signing the Gothenburg protocol to the Convention on Long-range Transboundary Air Pollution. This may give rise to questions as to why the EU was investing so much time and effort in order to come up with a NEC directive for the EU.

One main reason is that EU legislation is in practice more demanding than in-

ternational agreements. Having legally binding national emission ceilings established in EU legislation gives stronger provisions for follow-up and control of member states' implementation and compliance with the NECS.

Another reason is that the Commission is responsible for the achievement of EU environmental objectives, which in turn may require binding EU legislation. Since the EU has ratified the Gothenburg Protocol, it will furthermore be up to the Commission to ensure fulfilment of the Protocol obligations, and a practical way to do this will be through EU legislation, such as the NEC directive.

The directive's objectives

The aim is "to limit emissions of acidifying and eutrophying pollutants and ozone precursors" in order to improve the protection of the environment and human health against risks of adverse effects, and "to move towards the long-term objectives of not exceeding critical levels and loads and of effective protection of all

people against recognized health risks from air pollution."

Emission ceilings

By 2010 member states must have so limited their annual national emissions so that they do not exceed the emission ceilings laid down in Annex 1 (see Table 1), and they must also ensure that these emission ceilings are not exceeded in any year after 2010. The purpose of the emission ceilings is "to meet broadly" the interim environmental targets, set down in Article 5.

Following adoption of the NEC directive, national emission ceilings for 2010 have also been agreed with ten of the twelve so-called acceding countries. These NECs are prescribed in the accession treaties between the EU and each acceding country, and shown in Table 2.

Interim targets

The three interim environmental targets in Article 5, are:

ACIDIFICATION. The areas where critical loads are exceeded shall be reduced by at least 50 per cent in all areas as compared with the situation in 1990.

HEALTH-RELATED OZONE EXPOSURE. Ground-level ozone above the critical level for health shall be reduced by two-thirds in all areas compared with the situation in 1990. Moreover the ground-level ozone load shall not exceed a given absolute limit anywhere.

VEGETATION-RELATED OZONE EXPOSURE. Ground-level ozone above the critical level for vegetation shall be reduced by one-third in all areas compared with the situation in 1990. In addition, the load shall not exceed a given absolute limit anywhere.

Since the political compromise between the Council and the parliament resulted in less demanding binding emission ceilings (as compared with the Commission's proposal), the NECs of the directive will not be sufficiently stringent to attain the emission reductions necessary for meeting the interim targets. The directive therefore also contains so-called indicative emission ceilings (set out in Annex II). These are set for the EU as a whole (not for each member state), and reflect the emission reductions estimated to be needed EU-wide to meet the interim targets (see Table 3).

Programs and reporting

The directive lays down that by October 2002 member states must draw up programmes for the progressive reduction of national emissions of the four pollutants, and report them to the Commission, at

latest by December 2002. These reports shall provide information on measures and action taken at the national level to attain the emission ceilings. The national programmes shall be updated and revised by October 1, 2006. Member states are also obliged to make this information available to the public.

If prepared in accordance with the obligations, these programmes could provide useful information not only on projected future emission levels, but also on national forecasts regarding future levels of activity in the energy, transport, industry, and agriculture sectors. Moreover, if member states produce and disseminate this type of information properly, the likelihood of compliance with other air quality legislation, such as the EU air quality standards, could be better evaluated.

Member states shall also annually report their national emission inventories and projections for 2010 to the Commission. Methodologies for emission inventories and projections are specified in the directive.

Review and revision

Based on among others the information from member states, the Commission shall report to the European Parliament and the Council in 2004 and 2008 on progress made in the implementation of the national emission ceilings as well as on the extent to which the interim environmental targets are likely to be met by 2010, and on the extent to which the long-term objectives could be met by 2020.

In the review that is to be completed in 2004, the Commission shall include an evaluation of the indicative emission ceilings for the Community as a whole, and consider further cost-effective actions that might be taken in order to reduce emissions with the aim of attaining the interim environmental targets by 2010.

The reports by the Commission may be accompanied by proposals for modification of the national emission ceilings for 2010 and/or the interim environmental targets. The Commission may also propose "further emission reductions with the aim of meeting, preferably by 2020, the long-term objectives".

Stepwise improvements

In essence the methodology used when developing the directive is intended to ensure the attainment of agreed targets for improving protection of the environment and health, and to bring about an equal relative environmental improvement everywhere in the EU, while at the same time ensuring extraordinary improvements in the worst affected areas.

Table 1. National emission ceilings for SO₂, NOx, VOCs and NH₃, to be attained by 2010 by the EU15 member states (kilotonnes).

Country	SO ₂	NOx	VOCs	NH ₃
Austria	39	103	159	66
Belgium	99	176	139	74
Denmark	55	127	85	69
Finland	110	170	130	31
France	375	810	1050	780
Germany	520	1051	995	550
Greece	523	344	261	73
Ireland	42	65	55	116
Italy	475	990	1159	419
Luxembourg	4	11	9	7
Netherlands	50	260	185	128
Portugal	160	250	180	90
Spain	746	847	662	353
Sweden	67	148	241	57
UK	585	1167	1200	297
EU15	3850	6519	6510	3110

Table 2. National emission ceilings for SO₂, NOx, VOCs and NH₃, to be attained by 2010 by the acceding¹ and accession candidate² countries (kilotonnes).

Country	SO ₂	NOx	VOCs	NH ₃
Bulgaria	856	266	185	108
Czech Rep.	265	286	220	80
Cyprus	39	23	14	9
Estonia	100	60	49	29
Hungary	500	198	137	90
Latvia	101	61	136	44
Lithuania	145	110	92	84
Malta	9	8	12	3
Poland	1397	879	800	468
Romania	918	437	523	210
Slovakia	110	130	140	39
Slovenia	27	45	40	20

¹ The NECs for the eight acceding countries are not given in the NEC directive (2001/81/EC), but in the accession treaty for each country.

² The NECs for the two accession candidate countries (Bulgaria and Romania) have not yet been established. Therefore, the figures given in this table for these two countries are taken from the 1999 Gothenburg Protocol.

Table 3. Indicative EU-wide emission ceilings for SO₂, NOx and VOCs (kilotonnes).

	SO ₂	NOx	VOCs
EU15	3634	5923	5581

The aim of the general relative improvement is expressed in the form of a so-called gap closure towards the long-term objective where there will be no exceeding of critical loads. "Gap closure" means a stepwise gradual closing of the gap between the current environmental situation and the "ideal" situation (with no exceeding of critical loads). The extraordinary improvements are to be achieved by including absolute limits for exposure to pollutants in the gap-closure procedure.

A computer model for integrated assessment was used to arrive at a so-called joint optimization to find the most cost-effective way, for the EU as a whole, of achieving the environmental aims. This enabled the Commission to propose differentiated national emission ceilings, which largely reflect the polluter-pays principle and should maximize the environmental benefits of emission reductions.

Costs overestimated

A drawback of this methodology is that it tends to overestimate the costs of reducing emissions. The reason is partly that only technical emission abatement measures have been considered with no account taken of structural measures such as switching from coal to gas, increasing energy efficiency, greater use of alternative energy sources, and changes in the transportation and agricultural sectors. Emissions could be reduced at much lower cost through some of these structural changes than by relying solely on technical end-of-pipe solutions.

Furthermore, a highly doubtful energy scenario has been used in the computer modelling. This is largely based on information submitted by the individual member states, and would imply an *increase* in the EU emissions of carbon dioxide by about 8 per cent by 2010.

Such an increase is in absolute disregard of the commitments made by the EU and its member countries under the Kyoto protocol, which would involve a reduction of 8 per cent in the EU emissions of greenhouse gases (of which carbon dioxide is the most important). A computer run simulating a low-CO₂ scenario that would roughly accord with the Kyoto agreement brought the extra cost down by more than 40 per cent.

Benefits to health and the environment

The area of ecosystems where the depositions of acidifying air pollutants exceed the critical loads should be diminished as a result of the directive. There will also

be reductions in the exposure to damaging levels of ozone, both for people and vegetation. By lowering the emissions of SO₂ and NO_x, the directive will help reduce exposure to health-damaging fine particles (PM), since these two pollutants act as precursors to secondarily formed sulphate and nitrate particles.

Although no interim targets have been set for eutrophication, improvements can nevertheless be expected as result of the lower emissions of NO_x and ammonia. However, significant further reductions in emissions are needed in all cases in order to attain the long-term objectives for the protection of health and the environment.

The Commission has also made an analysis of the quantifiable gains from reducing emissions in terms of money. Account was taken chiefly of the effects on human health (morbidity and mortality), on farm crops and modern buildings and materials. Calculations showed the gains to be significant, and that the economically quantifiable benefits significantly outweighed the estimated costs. It should however be noted that a number of gains were not included, such as the direct health effects of NO₂ and VOCs, less acidification of soil and water, less eutrophication, fewer effects on biological diversity, lesser long-term effect on forest productivity, and less damage to historical monuments.

Level of ambition too low

The Commission's original proposal contained relatively strict national emission ceilings. Although largely supported by the parliament, they were firmly rejected by the Council. The resulting political compromise means that the NECS contained in the directive will not suffice even to attain the agreed interim environmental objectives for 2010.

The process of review and revision provides an opportunity to strengthen the existing NECS for 2010, but will more likely result in a future stepwise strengthening of the emission ceilings – for example by establishing new NECS for 2015 and 2020. In any case it is obvious that the attainment of the long-term objectives will require significant further reductions in the emissions of all four pollutants.

National reporting on programs

By early 2004, four EU countries – Belgium, Greece, Ireland and Luxembourg – had still failed to report to the Commission how they propose to reduce their emissions of air pollutants so as to fulfil their commitments under the NEC directive. Moreover, many of those that had

reported failed to do as the directive requires.

From the eleven national reports that were delivered, it appears that several of the member countries foresee difficulties in meeting their ceilings. The main problem seems to be nitrogen oxides. Based on "business as usual" projections as reported by member states, only Finland and the UK would comply with all of their emission ceilings by 2010. If envisaged measures are considered, Germany would also meet all its emission ceilings.

It is not however easy to determine how great the difficulties for meeting the ceilings actually are, since virtually all of the national programmes lack the information needed for an analysis – namely, quantitative estimates of the effect of policies and measures that are either planned, proposed or undertaken.

Future developments

The directive is scheduled for review and revision by 2004, thus providing an opportunity to strengthen the emission ceilings for 2010, to set new ceilings for later target years (say, 2015 and/or 2020), and to decide when the long-term environmental objectives should be achieved.

It is however likely that the first review and revision will be delayed by about a year, the reason being that the analysis and evaluation are to be co-ordinated with the ongoing Clean Air For Europe (CAFE) programme, initiated by the Commission in 2001.

The CAFE programme will result in a so-called thematic strategy for air pollution, to be presented by the Commission by July 2005 at the latest. This strategy is to be accompanied by proposals for revised and/or new directives relating to air pollution. Current developments under CAFE indicate that the NEC directive may also be extended to include national emission ceilings for fine particles (PM₁₀ or PM_{2.5}, or both).

Further information

An initial assessment of Member States' national programmes and projections under the national emission ceiling directive (2001/81/EC). Summary paper. ETC-ACC Technical Paper 2003-8, published in April 2004. Available at <http://air-climate.eionet.eu.int/announcements/ann1082666299>

The reports on national programmes received by the Commission can be found on the environment directorate's website http://europa.eu.int/comm/environment/air/nationalprogr_dir200181.htm