NO. 4, DECEMBER 2001

Acid News

ENVIRONMENT POLICIES

Could well be improved

IF ALL of the present EU policies concerning the environment were really carried out, the pressure on it would lessen in the Union during the next ten years, according to a study[1] made for the Commission by the Netherlands RIVM institute. But, say the authors, the harm to health as well as the environment could be much further diminished if those policies were to be accelerated. The cost of doing so would not exceed the benefits, and the effect on the economy at large is said to be manageable.

The study was mainly intended to provide material for the EU's Sixth Environment Programme, and to assess the effects of current trends and priorities. To this end, the group has examined the matter from twelve aspects:

Climate change. Acidification. Eutrophication. Tropospheric (ground-level) ozone. Chemicals and particulate matter. Air quality and noise. Biodiversity. Stratospheric ozone depletion. Nuclear accidents. Water quantity and quality. Waste management. Soil degradation.

Here however only the first six will be considered.

To begin with a baseline scenario was constructed as a means of assessing the adequacy of current policies and identifying remaining problems. This has been made to include all existing and proposed EU policies as they were in August 1997, and to show what the results are likely to be if all those policies have been fully implemented by 2010, the target year.

Although the situation as regards the environment would be improved according to this baseline scenario, it would still leave much undone. It does not solve for instance the problem of emissions of greenhouse gases,

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Acid News

is a newsletter from the Swedish NGO Secretariat on Acid Rain, whose primary aim is to provide information on the subjects of acid rain and the acidification of the environment.

Anyone interested in these problems is invited to contact the secretariat. All requests for information or material will be dealt with to the best of our ability. Acid News is distributed free of charge.

In order to fullfill the purpose of Acid News, we need information from everywhere – so if you have read or heard about something that might be of general interest, please write or send a copy to:

The Swedish NGO Secretariat on Acid Rain
Box 7005, S-402 31 Göteborg, Sweden

Tel: +46-31-711 45 15. Fax: 711 46 20

E-mail: info@acidrain.org

Internet: www.acidrain.org

Editor: Christer Ågren (cagren@acidrain.org)

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THE SECRETARIAT

The Secretariat has a board comprising one representative from each of the following organizations: Friends of the Earth Sweden, the Swedish Anglers' National Association, the Swedish Society for Nature Conservation, the Swedish Youth Association for Environmental Studies and Conservation, and the World Wide Fund for Nature Sweden.

The essential aim of the secretariat is to promote awareness of the problems associated with air pollution, and thus, in part as a result of public pressure, to bring about the needed reductions in the emissions of air pollutants. The aim is to have those emissions eventually brought down to levels – the so-called critical loads – that the environment can tolerate without suffering damage.

In furtherance of these aims, the secretariat operates by

• Keeping under observation political trends and scientific developments.

• Acting as an information centre, primarily for European environmentalist organizations, but also for the media, authorities, and researchers.

• Producing information material.

• Supporting environmentalist bodies in other countries in their work towards common ends.

• Acting as coordinator of the international activities, including lobbying, of European environmentalist organizations, as for instance in connection with the meetings of the Convention on Long Range Transboundary Air Pollution and policy initiatives in the European Union.

• Acting as an observer at the proceedings involving international agreements for reducing the emissions of greenhouse gases.

It must be done

ACCORDING TO the recently adopted NEC directive (on national emission ceilings), the EU member countries aggregate emissions of sulphur and nitrogen oxides are to be reduced by 75 and 50 per cent respectively from 1990 to 2010.

This is a necessary first step on the way towards fulfillment of the EU's long-term aims in regard to air quality – which are worth recalling. They are that

❑ all people should be effectively protected against recognized health risks from air pollution, and

❑ critical loads and levels for exposure to acidifying, eutrophying, and photochemical air pollutants shall not be exceeded.

While the EU countries' emissions of these pollutants are gradually going down, however, those from shipping are continuing to rise. In the seas surrounding Europe – the Baltic, the North Sea, the northeastern Atlantic, the Mediterranean, and the Black Sea – the annual emissions from ships plying in international trade were estimated to have been 2.8 million tons of sulphur dioxide and 4.0 million tons of nitrogen oxides in 1990. In other words, emissions from shipping in that year accounted for 17 per cent of the EU total for sulphur and 30 per cent of that for nitrogen oxides.

But if emissions from land sources in the EU should fall as envisaged, and those at sea should remain unchanged, by 2010 the latter will amount to three-quarters of the EU total for sulphur and nearly two-thirds for nitrogen oxides.

It should be noted that these figures refer only to ships in international trade. They do not include emissions from vessels operating in the EU countries internal waterways, or in their territorial offshore waters – both of which appear in the domestic statistics of each country. Furthermore, if marine transportation should go on growing at a rate of 2-3 per cent a year, as is sometimes assumed, the emissions from shipping might actually have surpassed those from land-based sources by 2010.

Both the Commission and practically all the EU member countries with the exception of Sweden have shown a notable lack of enthusiasm for attacking the problem of ships' emissions, despite it having been shown in several instances – including the Commission's own strategy against acidification of 1997 – that measures to reduce the emissions from shipping would be extremely cost-effective.

The matter has however already been taken up in the European Parliament, which managed – against the opposition of several countries – to get a new paragraph inserted into the NEC directive, obliging the Commission to present a "program of actions" for reducing emissions from international transportation by sea at the latest by next year (meaning 2002).

It should also be worth noting that there is a similar passage in the directive for limiting the sulphur content of certain liquid fuels (1999/32/EC), where the Commission has to put forward a proposal for action at the latest before the end of 2000. But that the Commission has apparently ignored. There is thus every reason to pressure it into doing something in the coming year.

Any further delay in taking steps to reduce emissions from ships would be unacceptable, especially as ships will otherwise continue to add millions of tons of pollutants per year to Europe's common airspace. EU environmental targets can moreover hardly be met without a drastic reduction of the emissions from shipping.

CHRISTER ÅGREN

PHOTO: BUNDESUMWELTMINISTERIUM, GERMANY

GROUND-LEVEL OZONE

Threshold values still widely overstepped

THE European Environment Agency reports[1] that the concentrations of ground-level ozone were still high in Europe this last summer. Following a directive from 1992, all the EU member countries have to report not only actual concentrations, but also any exceeding of two threshold values. The figures are then assembled by the EEA, together with those from ten other European countries.

The directive requires the member countries to inform their publics whenever concentrations exceed 180 µg/m^3 as an hourly average. This last summer that threshold was crossed over in eleven of the fifteen member countries, as well as in five of the ten outside the EU.

Italy reported the greatest number of times when the threshold was crossed (on 80 of the 153 days on which concentrations were measured), followed by France, on 58 days, and Spain on 48. It was also in the Mediterranean countries that the highest concentrations were recorded: 360 µg/m^3 in Spain, 358 in Portugal, and 353 in Italy.

There was on the other hand no exceeding anywhere of the threshold of 360 µg/m^3, hourly value – the level where the authorities of the EU member countries have to issue a warning to the public of possible harmful effects – although at their highest the Spanish concentrations just came up to it.

According to the EEA, the emissions of those air pollutants that lead to raised concentrations of ozone – nitrogen oxides and volatile organic compounds – had dropped in the EU during the nineties. Peak concentrations were consequently also lower. Background ones continued on the other hand to rise, a global increase in emissions of precursors being the suspected cause.

The EEA report was released at just about the same time as an agreement was reached within the EU as to a new directive on ground-level ozone (see p.15).

According to that agreement the concentrations must not be allowed to exceed 120 µg/m^3 (8-hour value) on more than 25 days a year from 2010. The directive also sets a new, so-called alert, threshold of 240 µg/m^3. When that is crossed, the member countries have to take steps, whenever possible, to reduce the concentrations.

CHRISTER ÅGREN

[1] **Air pollution by ozone in Europe in summer 2001: Overview of exceedences of EC threshold values during the summer season April-August 2001**. Final version October 22, 2001. Available at EEA website: http://reports.eea.eu.int/topic_report_2001_13/en.

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PHOTO: AUDIOVISUAL LIBRARY, EUROPEAN COMMISSION

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or of air quality (especially as concerns particles and ground-level ozone), or of acidification and eutrophication.

A second scenario was therefore developed to assess the extent by which environmental pressures might be relieved by the full application of technical, mainly end-of-pipe measures.

Although great improvements could be made by these means – for instance in respect of acidification and ground-level ozone – the cost was found to be often very high. The value of the benefits, by way of reduced harm to health and the environment, would nevertheless, according to this scenario, be two to three times as great.

Some problems, such as those arising from the emissions of greenhouse gases, cannot in any case be solved by the application of technical measures only. Structural and behavioural measures, to bring about changes in such sectors as energy and transportation, will also be needed – as they will, too, for dealing with particulates, although then mainly at the local level.

To judge the possibilities of achieving the targets for environmental quality that were set specially for the study, a third scenario was worked out, with the existing policies accelerated.

In contrast to the second, technology-driven scenario, this one includes structural changes, mainly in the way of energy conservation and fuel switching. Compared with the baseline scenario, this last one yields marked environmental improvements – although less than those obtained from the technology-driven version – except for emissions of greenhouse gases, which were lower in this third scenario.

Policies related to climate change will make others significantly cheaper

A general conclusion from analysis of the third scenario is that structural measures for transportation and agriculture will be needed for the attainment of any reasonably high environmental aims – in respect notably of eutrophication, biodiversity, and particulate matter, since transportation and agriculture bear a large responsibility in these cases.

It is important to note, in regard to the third scenario, that some policies would have positive effects in regard to other environmental problems although they had not been expressly developed for that purpose. Policies aimed at reducing the emissions of greenhouse gases, for instance, will produce secondary gains in the way of reduced acidification and lower concentrations of ground-level ozone and particulates.

If on the other hand the essential aim should be to improve air quality or reduce acidification, it would be likely that measures such as energy conservation and fuel switching would be applied. In that case there would be a secondary benefit in the form of reduced emissions of greenhouse gases.

Proceeding from measures to reduce greenhouse gases, the RIVM group tried to quantify the associated

secondary gains (spillovers) with results shown in Fig. 1. Thus, measures to reduce EU emissions of CO_2, the main greenhouse gas, by 8 per cent from 1990 to 2010 as agreed at Kyoto (which would mean cutting off 15 per cent from the level assumed for 2010 in the baseline scenario) would result in reductions of 24 per cent in the emissions of SO_2 and PM_{10}, and 8 per cent in those of NOx.

Similarly, measures aimed at cutting back acidification and ground-level ozone would also lessen the harm to biodiversity and bring reduced emissions of PM_{10}. And measures to reduce those last would lead to markedly reduced emissions of heavy metals.

This all means that policies related to climate change will make others that are needed to meet the environmental targets for acidification and ground-level ozone significantly cheaper. The cost savings would on the other hand be lower if the use of the flexible mechanisms of the Kyoto protocol were taken into account, such as by allowing emissions trading among the Annex B countries. Although the benefits would then also be less, it would, under the assumptions[2] made in the study, nevertheless still be more cost-effective than it would be otherwise.

Common to all three scenarios is that the social costs of the various policies would be distinctly lower than the estimated gains – despite the fact that neither the damage to ecosystems from acidification, nor that to cultural and historical objects caused by air pollution, have been taken into account at all in calculating the benefits.

CHRISTER ÅGREN

[1] **European Environmental Priorities: An Integrated Economic and Environmental Assessment.** March 2001. RIVM report 481505010. 189 pages. Can be ordered from the publisher (price 40 guilders) or downloaded free of charge as pdf file from the same: The National Institute of Public Health and the Environment, the Netherlands. Internet: www.rivm.nl.

[2] It is estimated that if advantage should be taken of the flexible mechanisms, the emissions of CO_2 in the EU would still be at the same level in 2010 as they were in 1990. The 7-per-cent reduction that would still be required could be obtained by buying emission rights from other Annex B countries – mainly Ukraine and Russia – at a price of euro 17.4 per ton of CO_2.

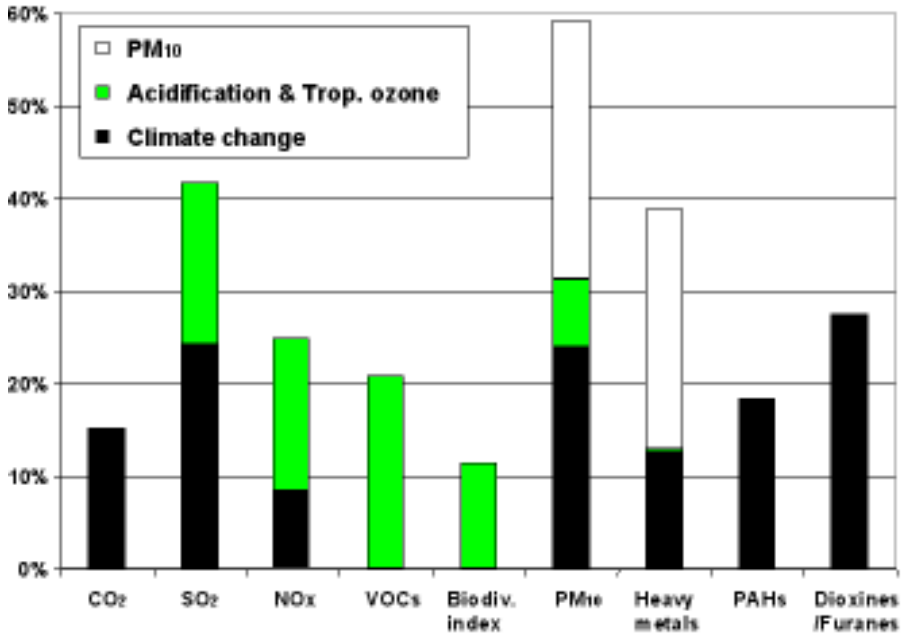


Figure 1. Benefits of an integrated-policy approach. Measures aimed for example at reducing emissions of the greenhouse gas CO_2 in accordance with the Kyoto protocol (making them 15 per cent less than they would have been in the baseline scenario) also results in reductions of 24 per cent for SO_2 and PM_{10} and 8 per cent for NOx. Addressing acidification and tropospheric ozone makes for less damage to biodiversity and lower emissions of PM_{10}. Separate measures to cut down the emissions of PM_{10} lead to markedly lower ones of heavy metals.

EU NEWS IN BRIEF

Agreed and settled

Following conciliation between the Council of Ministers and the European Parliament in regard to the new directives for national emission ceilings and large combustion plants, these directives could now come into effect since the Ministers and Parliament had agreed on them in their new form, on September 20 and 27 respectively.

Low-sulphur sooner

The environment committee of the European Parliament wants the sulphur content of fuels both for road and non-road vehicles to be less than 10 ppm (parts per million) by 2008. Last spring the Commission had proposed 2011 as the deadline. The parliamentary committee is also urging a review of the law in 2005 instead of 2006. Its proposal, now in its first reading, will be up for debate in plenum at the end of November, and will probably be considered by the Council of Ministers in December.

More must be done

Unless the EU countries make more effort to reduce their emissions of nitrogen oxides and fine particles, many of them will risk overstepping the limit values for the concentrations of these pollutants in urban air that are to come inte force in 2005 md 2010.

This is clear after a first review of the air-quality standards that were decided in 1999. The outcome is based on data supplied voluntarily to the Commission by some of the member countries. A fuller picture will emerge next September, when all the EU members are obliged to submit comprehensive data on air quality. One outstanding reason for the problem being worse than foreseen is that road traffic is continuing to increase, nullifying some of the gain from cleaner vehicles and fuels.

Source: **Environment Daily**. September 24, 2001.

Program now getting under way

Largely because of their effects on health, particles and ozone will be main targets

THE CLEAN AIR FOR EUROPE program (CAFE) was launched last May with a so-called communication from the Commission, and the CAFE Steering Group, which is primary adviser to the Commission in regard to the strategic direction that the program is to take, also held its first meeting in May.

In effect replacing the old Air Quality Steering group, this new one is composed of representatives both of the present member states and the candidate countries, the European Parliament, and also so-called stakeholders (with industrial and environmental interests), as well as other relevant international actors such as the European Environment Agency and the Convention on Long-range Transboundary Air Pollution.

A Technical Analysis Group has been set up to coordinate the work of making technical analyses that is to be part of the program. This is a small group of key experts, not a forum for stakeholder participation.

Moreover a number of working groups are foreseen. These will gather and evaluate research and technical analyses as aid to the development of CAFE's overall strategy and detailed policy. They will deal with such matters as the assessment of air quality, the question of implementation, and the development of scenarios.

This summer and fall an *ad hoc* group has been engaged on a schedule for the CAFE work program, which was one of the subjects for the second meeting of the steering group in October. Based on the end-products in the form of reports and proposals that are foreseen and should be presented in 2004, lists of what has to be done are being worked out, together with schedules, in order to arrive at a definite program.

The main end-products are likely to be:

- A description of the cost-effective measures that will have to be taken if the interim and long-term aims of the CAFE program for environmental quality are to be met.
- A report on the chief measures concerning sectors and sources (including international sea and air transportation) that are already in place, together with the commitments of other countries, and an assessment of the potential for further Community action.
- New proposals for national emission ceilings, air-quality standards, and other matters.

The CAFE Steering Group is expected to meet three or four times a year, and the next meeting is scheduled for December 10-11.

CHRISTER ÅGREN

The Clean Air for Europe (CAFE) Programme: Towards a Thematic Strategy for Air Quality. COM(200l)245.

The CAFE program – background

The CAFE program will focus mainly on particles and ground-level ozone, because of their marked effects on health and the fact that much will have to be done if their concentrations are to be brought down to acceptable levels. Problems that remain in respect of acidification, eutrophication, and damage to buildings will however be dealt with too, although it is intended that all pollutants that have significant effects through being airborne should be included – except for greenhouse gases, which are to be the subject of another program.

It is intended that the first of the thematic strategies, announced in the Commission's proposal for a Sixth Environmental Action Programme earlier this year, shall be the initial outcome. That strategy should be ready for adoption in 2004.

The idea is however that CAFE shall "evolve into an on-going cyclical program," with 2004 as only the first milestone. It is to include evaluations of current legislation and analyses of the measures for the further reduction of emissions that will be needed for meeting air-quality and deposition objectives, and make proposals in regard to new or revised directives for air quality and national emission ceilings. A status report is also to be made on measures that are being taken to reduce emissions from specific sources, such as large combustion plants and motor vehicles.

Commission favours Union emissions trading

ON OCTOBER 23, just before the start of the UN climate conference in Marrakech, the EU Commission presented proposals and guidelines for EU climate policy the coming years. Besides a proposal for ratifying the Kyoto protocol, they included a scheme for emissions trading within the Union. A communication outlining coming initiatives was also issued.

Ratifying the Kyoto protocol

During the past year the EU has stood out as the party taking the greatest responsibility for ensuring that the 1997 protocol will finally come into effect. Following the agreement reached in Bonn this summer (see AN 3/01), the Commission has now put forward a proposal for legislation to make binding the previously agreed distribution among the member countries of the EU's commitment in respect of emissions, and enable all the members to have ratified the protocol at the latest by June next year.

The idea is that the EU commitment shall be definite before the UN meeting in Johannesburg, marking the 10-year anniversary of the conference on the environment at Rio de Janeiro in 1992, where the climate convention was signed.

Permit trading

A system for trading in emissions permits within the EU could, in the view of the Commission, be "an important cornerstone" in the EU strategy to fulfill its commitment under the Kyoto protocol. It is suggested that permit trading would also enable emission reductions to be made where they are cheapest.

The Commission would have trading start in 2005. To begin with however it would only be in emissions of carbon dioxide from large plants in the industrial and power sectors. It is estimated that the four to five thousand plants that could be involved would be accounting for about half of the total EU emissions of CO_2 in 2010. The Commission will consider extending the directive to other sectors of the economy and also to other greenhouse gases in 2004.

Each member country will allocate emission allowances to each plant every year, and gradually reduce the number of allowances in circulation so as to ensure emissions coming down at the desired rate. Allowances can be bought and sold, but there will be no obligation to engage in trading them. There will be fines for plants overstepping their allowance.

Forthcoming initiatives

In March last year the Commission started its European Climate Change Programme, to arrive at a package of measures for attainment of the EU's Kyoto commitment at the least possible cost, and this summer it presented a list of forty or so possible measures where the cost would not exceed 20 euros for each ton of carbon dioxide that is eliminated (again AN 3/01). The resulting reduction of emissions could be twice as great as required of the EU in the Kyoto protocol.

The Commission has now issued a communication presenting initiatives it considers should be set going during the next two years, which together would close half of the gap between the EU's Kyoto commitment and the Union's likely emissions in 2010.

The proposed measures include legislation for combined heat-and-power generation, for energy-efficiency requirements on end-use equipment, and the management of energy demand, as well as initiatives to promote energy efficiency in public procurements and to shift traffic away from the roads to other modes of transportation.

But that will not be the end of the European Climate Change Programme. Several proposals for further legislation are said to be on the way too.

PER ELVINGSON

All the Commission's proposals can be found on internet: http://europa.eu.int/comm/environment/climat/home_en.htm

EU NEWS IN BRIEF

Needing attention

The Commission has had an examination made of the possible economic effects of various limit values for PAH (polyaromatic hydrocarbons). Noting that the great lack of data makes it difficult to draw any definite conclusions, the consultants nevertheless say they have found that almost 90 per cent of the lung cancers attributable to PAHs are probably a result of the burning of solid fuels in households, adding that this is where it will be most urgent to take action.

The study from which the above is taken can be found on http://europa.eu.int/comm/environment/enveco/studies2.htm.

Opposition to US system

The directive on rules for emissions from small spark-ignition engines – which are responsible for 10-15 per cent of the hydrocarbon emissions in the EU – was debated at a first reading in the Parliament on October 2, followed by the Council of Ministers taking up a common position on the matter on October 29.

The Parliament, as also most of the Council members, had no serious objections to the Commission's proposal for emission standards for these engines (see AN 1/01). It did however want to bring forward the starting date by a couple of years. Controversy centred on the Commission's proposal to allow a flexible introduction of the emission requirements – through an "average and banking" system on US lines, which permits manufacturers to compensate for high emissions from one type of engine by lower ones from another.

The Parliament and many member states were against it, mainly because of the feared difficulty of overseeing such a system. It was agreed however on both sides that the Commission should allow exceptions of some types of engine that are difficult to adapt. The directive now goes to Parliament for a second reading.

Small boats

With a few minor exceptions in regard to technical details, the EU environment ministers agreed on October 29 to the Commission's proposal for emission standards for pleasure craft (AN 1/01). The Parliament had however, at its first reading, wanted some changes that would among other things relax the environmental requirements for boats built by the owners.

Called a "toothless tiger"

Said to lay more focus on relieving congestion than on achieving sustainability.

IN A WHITE PAPER for a common policy for the EU,[1] the Commission emphasizes the need for gradually breaking down the tie between economic growth and the demand for ever more transportation. While the Commission's attitude was in general approved by the member countries' ministers of environment and transport, it was denounced as a "toothless tiger" by the European Federation for Transport and Environment (T&E), the environmentalists' umbrella organization for such matters.

The aim of the white paper's proposal is said to be to bring about "substantial improvements in the quality and efficiency of transport in Europe." The idea is to reduce congestion on the roads and the pressure on the environment while at the same time maintaining the competitiveness of the EU.

As the means of attaining that end, the Commission lists some sixty measures, for which it will be presenting detailed proposals in due course. In order to check the march of transportation in relation to economic growth, the Commission wants to see the market shares of the various modes reduced to their 1998 levels by 2010 – a task which in view of the steady growth of road traffic is thought likely to entail considerable changes in current policy.

In the white paper the Commission says it will be putting forward measures to correct imbalances in the pricing of transportation. Thus in 2002 it will propose a "modern framework" for charging for use of the infrastructure, which would include internalization of the external social and environmental costs and replace the Eurovignette system. In view of last year's uproar over fuel prices, the Commission is also proposing a harmonization of EU taxes on diesel for business use, with the aim of correcting competitive distortions in a liberalized freight market.

There are furthermore proposals for revitalizing the railways – identified as the "strategic sector" for the achievement of modal shift, especially as regards freight carrying. A scheme for railway liberalization will be published before the year is out.

The white paper was praised by the International Road Transport Union for its "realistic" view that transportation would be likely to go on increasing. Besides being in favour, too, of full liberalization of the railways, the IRU welcomed the Commission's idea of charging for use of all parts of the infrastructure, not only for the roads. It would however like the income to be returned to the sector that had generated it – whereas the Commission would earmark it for investment in the railways.

The T&E does not mince words in condemnation of the white paper,[2] claiming that its proposals will fail

PHOTO: AUDIOVISUAL LIBRARY, EUROPEAN COMMISSION

T&E's criticism in brief

Weaknesses:

❏ Overall objective is congestion rather than sustainability.
❏ Policy target is modal shift rather than demand management.
❏ Policy measures are unlikely to achieve even the limited objectives.
❏ No detailed measures to tackle the climate-change emissions despite previous assurances that there would be.
❏ Fails to recognize that environmental problems are more extensive than climate change.
❏ Maritime transport is to be promoted despite having a worse environmental and social performance than any other mode of transportation.
❏ Projections for the development of transportation are inconsistent and poorly constructed.
❏ Focuses on the rights of users of transportation rather than on the rights of citizens who suffer the effects.
❏ No stakeholder consultation in the drafting process.

Strengths:

❏ Does recognize that there is a crisis facing European transportation, including its lack of sustainability.
❏ Accepts that modal shift will be necessary, together with other policies.

to bring about the "significant decoupling of transport growth from GDP growth" that was called for by the political leaders of the EU in the strategy for sustainability adopted at Gothenburg last June. The T&E maintains that the white paper's focus is more on relieving road congestion than on achieving a sustainable transportation system – saying that the Commission should concentrate on demand management rather than confining itself to modal shifts.

Discussing the white paper at an informal meeting in September, the EU environment and transport ministers indicated that they were on the whole satisfied with the Commission's general goal of curbing the growing dominance of road traffic in the transportation field, and that they were of the opinion that it was realistic to aim at a return of the various modes' share of the market, by 2010, to the levels prevailing in 1998. While Spain and Greece were said to have claimed that this was expecting too much, and that the rules should be made to vary from country to country, Austria, Denmark, and Sweden argued that more in the way of modal shift would be needed if the environmental targets were to be met.

Summarizing the debate as host of the meeting,[3] the Belgian chair wrote that all were agreed that the rapid implementation of a "fair and efficient pricing system," which would include internalization of the external social and environmental costs, was crucial for the attainment of decoupling and modal shift. This was also the view expressed in the strategy for sustainability adopted at Gothenburg. The environment and transport ministers said they wanted to see a full proposal from the Commission within "a reasonable future."

The ministers also asked their ministers of finance to attend as soon as possible to the matter of the directive governing the minimum level of excise taxes on mineral oils, which has been in the doldrums.

PER ELVINGSON

[1] **European transport policy for 2010: time to decide**. COM(2001)370. Available at http://europa.eu.int/comm/energy_transport/en/lb_en.html.

[2] Press release available at www.t-e.nu.

[3] Available from the Belgian EU presidency at www.eu2001.be.

The general trend

THE EU ENVIRONMENT agency, EEA, reports[1] that pressure on the environment from transportation – especially by road and air – is continuing to increase. And it is doing so despite a growing tendency of policy makers, as well as actors in the sector, to take the environment into consideration when making decisions.

Transportation affects the environment by emitting large amounts of toxic pollutants and greenhouse gases to the atmosphere, by generating waste and noise, and fragmenting the countryside. It also causes damage to human health.

Most of the EEA's key indicators – 33 in all – either give warning of unfavourable trends or show that there will still be a long way to go before targets for the "greening" of the transport sector can be met.

Current trends are leading away, says the EEA, from the recently announced EU objective of breaking the link between economic growth and increased transportation, and bringing back to rail, sea, and inland waterways the share of the market they had in 1998 by 2010.

With an increasing use of road vehicles and aircraft, passenger and freight carrying has been growing at a faster rate than the economy as a whole, again bringing increasing threats to the environment and human health.

But the EEA also notes some favourable trends, mainly because – as a result of advances in technology and the composition of fuels – new road vehicles are less polluting than older ones. There has consequently been a significant improvement in urban air quality, although it still poses health risks and needs improvement in many cities.

While there has been a slight improvement in the general energy efficiency of cars during the last two decades, the gain has been partly offset by low occupancy rates and increasing numbers of heavier and more powerful vehicles.

No improvement in energy efficiency has been recorded on the other hand in road freighting, and little for carrying by rail or sea, and despite technical advances, air transportation is still the least energy-efficient mode.

Although most of the EU countries have integrated strategies for transportation and the environment, many of them have yet to be finalized, funded, and implemented. Then, too, the national ones are not always in line with EU strategies and policies. Most notable has been the failure to take steps to ensure that the prices charged by each mode will also cover the cost of environmental damage, accidents, and congestion.

Furthermore, decisions concerning transportation continue to be made largely in response to the problem of bottlenecks, with a consequent favouring of road and airport infrastructures.

The following are among the findings and projections of TERM 2001:

- ❏ Between 1990 and 1998 the emissions of acidifying gases from transportation fell by 20 per cent, and those of the pollutants that lead to the formation of ground-level ozone by 25 per cent. But more effort will be needed if the EU targets for reducing these emissions are to be met.
- ❏ Since 1985 the consumption of energy in this sector has increased by 47 per cent, as against an average of 4.2 per cent for all others.
- ❏ While transportation is responsible for 24 per cent of all the man-made emissions of carbon dioxide, the main greenhouse gas, in the EU countries, transporting by road alone accounts of 84 per cent of that total, and between 1990 and 1998 the emissions of CO_2 from transportation increased by 15 per cent.
- ❏ The EU countryside is becoming increasingly fragmented by the expansion of the transportation infrastructure. Since 1980 the length of the motorway network has increased by 70 per cent, while that of the railway lines has decreased by 9 per cent.
- ❏ Since 1990, too, the number of cars in the EU had gone up by 64 per cent, so that by 1998 there were 451 cars per 1000 inhabitants in the union.

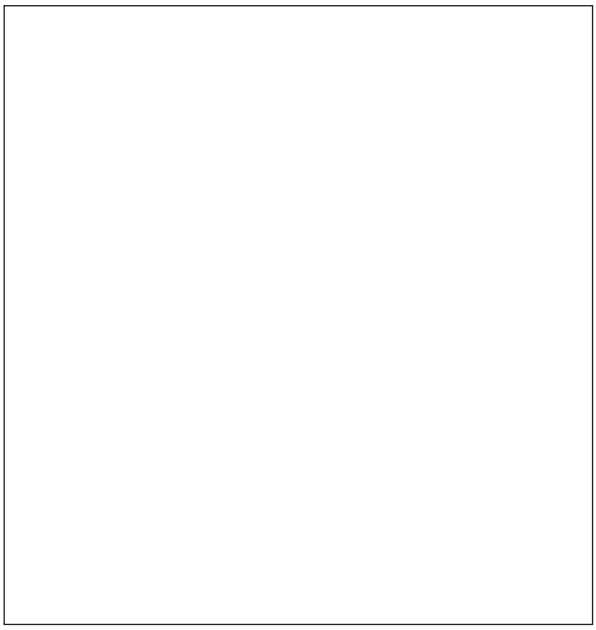
[1] **TERM 2001: Indicators tracking transport and environment integration in the European Union**. (TERM: Transport and Environment Reporting Mechanism.) Can be obtained from all sales outlets for EU publications. The full version in English is posted on the EEA's website at http://reports.eea.eu.int/term2001/. Summary in all EU languages.

Gains in spite of everything

The investments that will be needed if the candidate countries are to meet EU environmental standards will cost them a lot, but it will nevertheless pay for those countries to make them.

TO BRING national legislation in line with the EU standards will of course be a hard task for the candidate countries. Almost 300 legal documents will have to be gone through, and the investment needed has been estimated to amount to 80 to 120 billion euros for the ten countries of Central and Eastern Europe alone. The annual sum will come to something like 10 billion euros.

It seems however that the gains to society will, in terms of money, be at least as great, if not greater – 12 to 69 euros a year is what Ecotec, the British consultants employed by the Commission's environmental directorate to make the estimates, have arrived at.



One of the many installations that will have to be adapted to EU standards – the Balti power plant in Estonia.

The Ecotec study took into consideration all the main EU directives concerning air, water, and waste, examining their effect in all thirteen candidate countries – Turkey, Cyprus, and Malta, as well as the ten in Central and Eastern Europe.

A good half of the financial gain that would result, if all thirteen of those countries should conform to EU legislation, has to do with improved air quality – and there the most important benefits would be to health, with among other things fewer cases of respiratory disease, and – what is more – fewer premature deaths.

The consultants estimate that by reducing the concentrations of small particles in the air, full implementation of the EU directives would lead to the avoidance of anything from 15,000 to 34,000 premature deaths every year in the candidate countries as a whole. Poland would be expected to benefit the most, having something between 7,000 and 14,000 fewer cases in 2010.

Conforming would also mean that 43,000 to 180,000 cases of chronic bronchitis would be avoided in 2010. Many of these would be in Turkey, where burning of low-quality lignite at power stations is one outstanding cause.

Unless there is legislative conformity, the emissions of sulphur dioxide could be expected to amount to 7 million tons a year in the candidate countries in 2010, but 4-5 million tons if they do conform – even with no consideration taken of the effect of the recently adopted directive on large combustion plants. Nitrogen oxides would drop from 3 to 2 million tons a year.

Concomitant effects would be less damage to buildings and crops, as well as a lower incidence of respiratory diseases. Thus the area of building surfaces needing maintenance in the Czech Republic, for instance, would be about 2.6 million sq. metres less in 2010, while wheat harvests in Bulgaria would have increased by 5 per cent in 2005.

The greatest gain in terms of money, if all conform to EU standards, would occur in Poland, Turkey, Romania, and the Czech Republic. See table below.

A great part of the gain for some

Estimated annual gains from full compliance. Air-related and total gain (million euros).

	Air		Total	
	Low	High	Low	High
Bulgaria	110	1130	290	2240
Cyprus	30	140	65	310
Czech Republic	730	3600	2390	7220
Estonia	40	210	75	490
Hungary	590	4100	985	7080
Latvia	50	320	95	570
Lithuania	160	820	290	1300
Malta	8	40	24	130
Poland	2650	15400	4210	21400
Romania	780	5850	1270	9800
Slovakia	350	2250	690	3370
Slovenia	70	475	240	1120
Turkey	2180	9700	3140	14950
Total	**7700**	**44000**	**12500**	**69300**

countries would come from measures taken by their neighbours, especially in the case of air pollutants. Half of the benefits to Hungary, for example, would be a result of action in other candidate countries – assuming, that is, that they all have joined. In Poland domestic measures are likely to be of greater benefit abroad than at home – yielding 2.5-11.8 billion euros a year in Poland and 4.1-24 billion to others.

The present EU members would also benefit from the candidates' conformity. The gain from reduced cross-border transports of air pollutants would amount – at a low estimate – to 6.5 billion euros a year. Polish compliance with EU directives for example would benefit the EU countries in this respect to the extent of 1.7 to 10 billion euros per year. But they would be even greater for some non-EU countries, especially for Ukraine, Belarus, and Russia, where they could be worth as much as 9.5 billion euros a year, again at a low estimate.

The consultants add that, given the uncertainty of all these estimates, the lower figures should be used, so as not to exaggerate the effects of conformity. They also point out the difficulty of assessing the effects in terms of money. For one thing, some of them, such as damage to biological diversity, have not been taken into account when making the estimates. The figures, they say, should therefore not be taken as absolute, but rather as an indicator of the importance of the benefits.

They also add a number of recommendations in regard to policy, pointing out that the candidate countries will have more to gain from quick admission than from a long-drawn-out transition period. The increase in benefits would, they say, also be larger under an accelerated program for compliance than any increase in the costs.

PER ELVINGSON

The Benefits of Compliance with the Environmental Acquis for the Candidate Countries. Available at http://europa.eu.int/comm/environment/enlarg/benefit.htm.

Divergent views

THE CONCILIATION negotiations between the European Parliament and the Council resulted in an agreement, on October 23, for a new directive on air-quality standards in respect of ground-level ozone.

According to that agreement, the maximum number of days, on which ozone levels may be allowed to exceed the World Health Organization's recommended guide value of 120 micrograms/m^3, has been set at 25, with 2010 as the final date for implementation. There is however a loophole, derogation being allowed where that is "not achievable through proportionate measures." The compromise text thus represents a clear watering-down in comparison with the Parliament's original aim of no more than 20 days, and making limit values binding with no exception.

The Parliament had also called for the inclusion of a definite date (2020) for attainment of the long-term aim of setting a stop to any exceeding of the guide value recommended by the WHO. This demand was first rejected by the Council, but as a result of the compromise that deadline has now been included, although still with the same loophole.

The outcome was described by the parliamentary rapporteur, the Liberal MEP Chris Davies from the UK, as "a good compromise" and "real progress on the position of two years ago." On the other hand the European Environmental Bureau (EEB) expressed disappointment, especially at the retainment of loopholes, which in its view provide an escape clause for foot-dragging member states.

The agreement still has to be formally approved by both the Council and the Parliament, but that is likely to take place within the next few months.

CHRISTER ÅGREN

The official text of the agreement will be made available at the website of the European Parliament's conciliation secretariat: http://europarl.eu.int/code/backgrou/default_en.htm.

Doing it voluntarily

Instead of the present tax on emissions of sulphur dioxide, which is to be abolished at the end of the year, the Norwegian government wants to reach voluntary agreements with industry to reduce them, and has already succeeded in one case – with the Federation of Norwegian Process Industries (PIL), whose members have undertaken to cut emissions of SO_2 by 5000 tons annually by 2010. The Federation has also agreed, according to a government statement, to draft a plan for eliminating a further 2000 tons "at least possible cost to Norway." A spokesman for PIL has said that the industry would be paying the equivalent of the former SO_2 tax into an internal fund for financing the instalment of cleaning equipment.

Environment Daily, September 21, 2001.

First to be caught

Spain is the first country to have been convicted in the European Court of Justice for failing to implement the EU framework directive of 1996 on air quality in its national legislation – as it should have done at the latest by May 1998. At stake when the case came up was whether the directive allowed member states to delay designating competent authorities until the first daughter directive had been agreed in 1999. The Spanish government argued that it did, but the court disagreed.

Environment Daily. September 13, 2001.

Well away

This year a record number of participants was registered for Europe's recurrent car-free day – with almost a 1000 cities and smaller towns observing it. According to the estimates of the EU Commission, some 100 million people must have been involved. The main aim of this car-free day, which has Commission support, is to convince people that there are alternatives to the car for getting about in town. This year the participating cities were encouraged to work for lasting change by signing up for a car-free-day charter committing them to implement sustainable transportation policies.

More information: www.22september.org.

Saved in Morocco

DESPITE the defection of the US, the nations assembled in Bonn this summer managed to save the Kyoto climate protocol. A number of details had however to be left to be decided at the meeting in Marrakech – the seventh conference of the parties to the climate convention, COP7 – in November. It is now hoped that as a result of compromises reached there, the protocol can come into effect next autumn.

It was possible in Bonn to agree on several important matters that had lain unresolved ever since the signing of the protocol at Kyoto in 1997. Sizable concessions were made to Japan and Canada, giving those countries extra allowances for the use of carbon sinks, the carbon fixed in trees and soil, as an alternative to reducing emissions.

But other important matters had been left for decision at Marrakech, among them being the detailed rules for emissions trading, the sharing out of carbon sinks, and the rules for compliance with the protocol. It ended in agreement in most respects, but also in special concessions to Russia, which considered it had been given a worse allotment of sinks in Bonn than Japan and Canada.

It was especially from Russia and Japan that objections came in regard to sanctions for countries not living up to their commitments under the protocol. The question was whether they should be considered binding or not. A compromise was found in postponement of a formal decision as to the exact legal nature of compliance – accompanied however by the statement that countries must accept the compliance rules if they wanted to take part in emissions trading.

The protocol cannot come into force until it has been ratified by at least 55 countries and by so many of the developed countries as account for at least 55 per cent of the emissions of carbon dioxide from that group. In the absence of the US, this means that ratification will be needed from practically all the larger industrialized countries.

So far 40 countries have ratified, although there was only one – Romania – from the industrialized group. It is hoped that the protocol can come into effect in time for the UN environment conference in Johannesburg in September next year, just ten years after the signing of the climate convention.

Note. We reported the Bonn agreement in AN 3/01. See more about the climate convention and the Kyoto protocol on www.unfccc. int, and comment by environmentalist organizations on www.climatenetwork.org. For further links to climate websites, see the Secretariat's website www.acidrain.org/climate.htm.

A lot more needed

The EU environment agency, EEA, has taken a close look at the results of efforts made to date to reduce the emissions of greenhouse gases in the Union. It appears that although the overall emissions had certainly come down by 4 per cent between 1990 and 1999, this was largely due on the one hand to the fact of 1999 being a warm year, and on the other to measures that are hardly likely to be repeated, such as those that brought changes in the power generating and industrial sectors in Germany. If nothing further is done, emissions in 2010 will probably be an odd percent above or below their 1990 level. In other words, far away from the EU commitment at Kyoto to bring them down by 8 per cent.

The EEA report also shows that on present trends more than half of the member countries are headed towards considerably exceeding their agreed share of the total emissions allowed the EU under the Kyoto protocol. This applies to Austria, Belgium, Denmark, Greece, Ireland, Italy, the Netherlands, Portugal, and Spain. Three countries – Sweden, Finland, and France – will just meet their requirements, while three others – Germany, the UK, and Luxembourg – will do so easily.

Source: **European Community and Member States greenhouse gas emission trends 1990–99**. August 2001. Topic Report 10, 2001. Available at www.eea.eu.int.

Better maps bring out more detail

THE EFFORTS of the last few decades to reduce the fallout of air pollutants in Europe, which have resulted in a number of important international agreements, have depended to a large extent on the mapping of critical loads.

The maps are made by the Coordination Centre for Effects (CCE) under the Convention on Long-range Transboundary Air Pollution, and the way they are produced has now been described by the Centre in its latest report, where the changes from the previous report are also described.

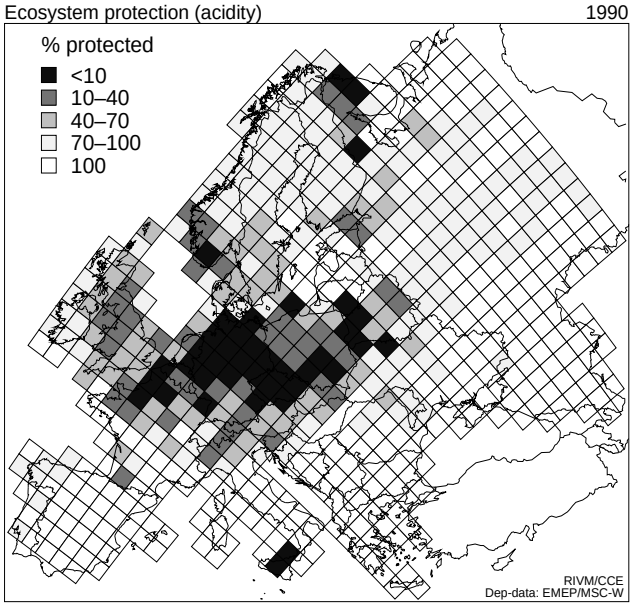
A difference this time is that the critical loads are being shown on 50x50 instead of 150x150km squares (the latter being nine times as great as the new ones). This has resulted in the emergence of areas with higher sensitivity that had previously been suppressed because of their insignificance in a large square.

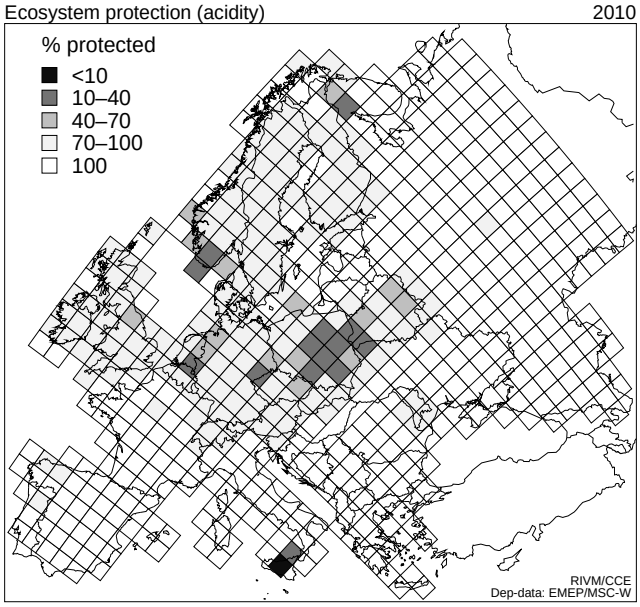
But better resolution has not only made it possible to pick out sensitive areas. It has also meant that the areas of ecosystem where the critical load is being exceeded can be better shown. It appears from this change in methodology that with the wider network of the old grid the real extent of the problem had been underestimated.

There are also maps in the report showing the extent to which the critical loads for deposition of acids and nutrients had been exceeded in 1990, and what can be expected in 2010 if every country fulfills its undertakings in accordance with the Gothenburg protocol. See opposite.

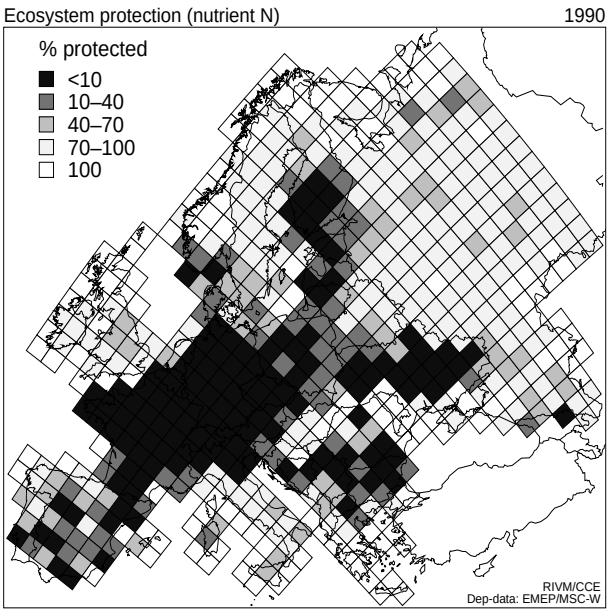
New, too, are the maps showing the sensitivity of various ecosystems to acid depositions. In previous reports all ecosystems had been lumped together in a single map, which tended to show the most sensitive areas of each square.

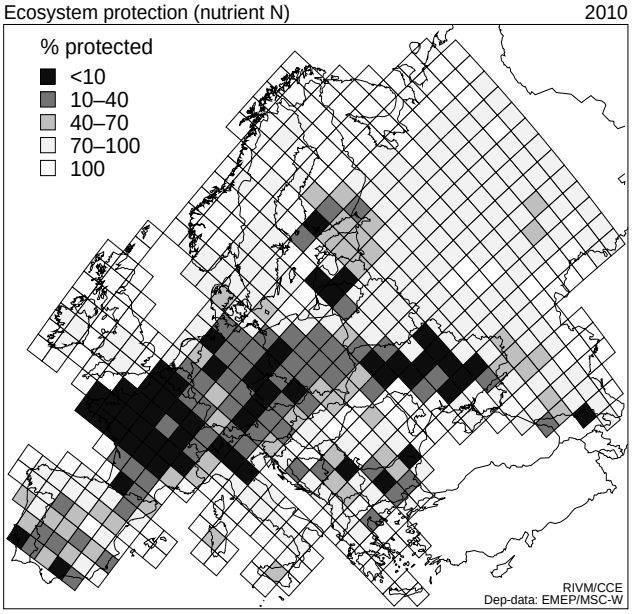
This time the CCE also describes what it will be doing in future to illustrate not only where ecosystems are at risk but also the actual effects of depositions on nature and the time





These maps show the extent of the ecosystems in each 150x150 km square where the critical load for acid deposition would not be exceeded, given (a) the fallout in 1990, and (b) that which can be expected in 2010 if all countries fulfill commitments made under the Gothenburg protocol. Note that it is the ecosystems at risk that are shown, not the actual extent of damage in any one year. Owing to the sluggishness of natural processes, there will be a considerable time lag, with the effect of previous fallouts remaining for many decades, or even in some cases for centuries.





The extent of ecosystems in each square where nitrogen deposition was either beneath the critical level in 1990, or is expected to be in 2010, assuming countries will act as above.

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that will be needed for recovery (by using so-called dynamic modelling). Work is further being done to make it possible to give better indication of the degree of uncertainty in the calculations.

PER ELVINGSON

[1] **Modelling and mapping of critical thresholds in Europe. Status Report 2001**. Edited by M. Posch, P.A.M. de Smet, J-P. Hettelingh, and R.J. Downing. Coordination Centre for Effects under the Convention on Long-range Transboundary Air Pollution. Bilthoven, Netherlands.

CCE also has a website, from which all its status reports can be downloaded: www.rivm.nl/cce.

Maps courtesy of Max Posch of the Coordination Centre for Effects/RIVM, The Netherlands.

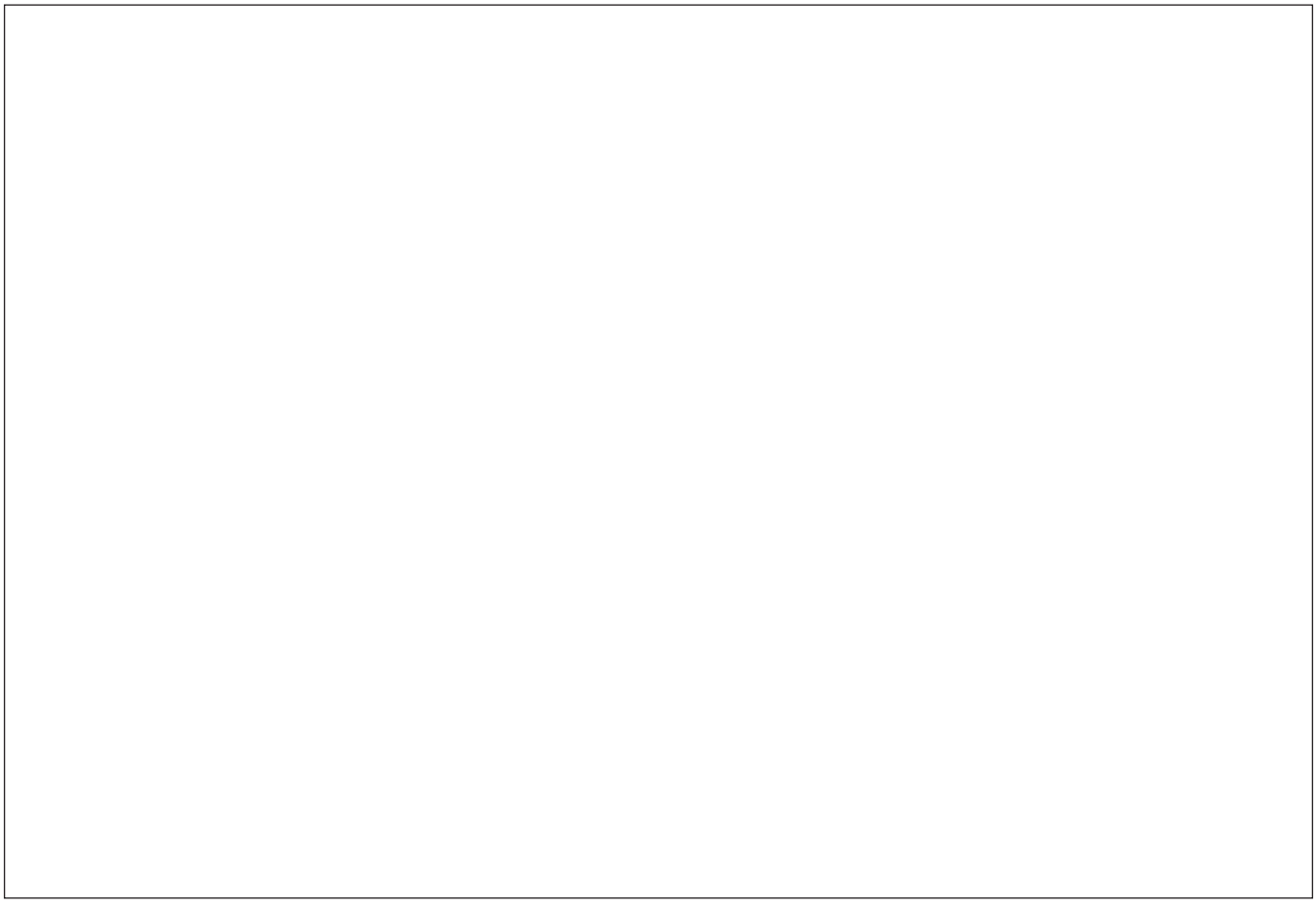

PHOTO: PORT OF GOTHENBURG

BALTIC SEMINAR

Pollution from ships worse than thought

In ten years their acidifying emissions could equal those from all EU land-based sources.

AMONG THE MATTERS debated last October at an international NGO seminar on sustainable transportation in the Baltic Sea Region was the problem of how to curb the emissions of air pollutants from ships plying in international trade.

Preliminary projections presented by Nicola Robinson of the EU Commission's environment directorate general showed that the emissions of sulphur and nitrogen oxides from such sources are probably much larger than had previously been thought – the reason being the increase in sea transport that had taken place since 1990, the year so far used for all emission calculations.

According to one scenario the emissions of sulphur dioxide from ships in international trade in European waters might well be greater in 2010 than the total from land in all EU countries that year. But that would assume a high rate of growth for sea transport – 3 per cent per annum up to 2010 – and fulfillment by all the member countries of their commitments under the directive on national ceilings for emissions, which has just been adopted. The emissions of nitrogen oxides from ships would under the same scenario be equal to about 80 per cent of those from sources on land.

Makes sense to invest in measures at sea instead of more expensive ones on land

Under a scenario assuming a more moderate rate of growth – 1.5 per cent per annum – ships' emissions would still be considerable and could amount to about three-quarters of those of sulphur dioxide from land sources, and 60 per cent of nitrogen oxides.

To obtain more exact figures, the Commission is paying for a detailed inventory of the emissions from shipping in the year 2000, which is hoped to be ready by next spring. This will serve as a basis for the development of a Commission policy on ships' emissions. A so-called communication, proposing a strategy for reducing those emissions, is expected from the Commission next year.

Among the likely proposals, according to Robinson, will be some sort of regulatory measures to limit the sulphur content of the fuel oil. There will also be a detailed examination of the possibilities of using economic incentives, especially for dealing with the emissions of nitrogen oxides. Voluntary and opera-

tional measures will also be considered.

The Swedish system, with environmentally differentiated fairway and harbour dues, which has been in operation since 1998 and has proved successful, was described by Stefan Lemieszewski of the Maritime Administration.

There are however obstacles to the introduction of this kind of incentive generally in the EU. Not all countries charge fairway dues – the cost of fairway maintenance in those cases being paid by all tax payers.

Moreover any decision involving common taxation within the EU requires unanimity among the member states when it comes to voting in the Council.

"Fair pricing" – to make each mode pay its costs – which is being increasingly suggested, may be a means of overcoming the first obstacle. It was for instance recently brought up in a paper from the Commission on infrastructure charging generally, and could lead to all member states introducing fairway dues.

As regards the need for unanimity, new figures on current and future emissions may make it apparent to decision makers that action is needed, and that it makes sense to invest in relatively cheap abatement measures at sea instead of imposing even more stringent – and more expensive – requirements on land-based sources.

Measures advocated by the organizations attending the seminar included:

❑ The introduction of abatement strategies, such as environmentally differentiated fairway and harbour dues, by all nations and at all seaports around the Baltic Sea. Preferably by decision within the EU, otherwise by the states concerned.

❑ The imposition, no later than 2005, of a ban on the sale and use of fuels with a sulphur content of more than 1.0 per cent.

PER ELVINGSON

Further information on the seminar can be obtained from Susanne Ortmanns at the Swedish Society for Nature Conservation, susanne.ortmanns@snf.se. A study of an EU system for reducing the emissions of sulphur and nitrogen oxides from ships, made for the Commission, was reviewed in the 4/00 issue. See also on the Secretariat's website, www.acidrain.org/policy.htm.

Needs more attention

Little has been done to determine the extent to which ships are contributing to the high levels of pollution in major port cities.

THE EFFECT emissions from ships may have on local air quality has recently been studied in a project[1] for a degree at Gothenburg University.

Considering that large ports are often located in or close to densely populated areas where the air quality is often bad, it is surprising that the contribution of shipping to the problem has been given so little attention, says Saara Nummelin in her paper on the project.

She had sent out a questionnaire to the authorities of thirteen large ports in Europe.[2] Of the eight that replied, only two – in Gothenburg and Helsinki – could account for ships' share of the emissions of air pollutants in their locality. For three others – Bergen, Hamburg, and Rotterdam – there was data, but it was either unknown to the port authorities or not submitted by them.

The share of ships' emissions of sulphur and nitrogen oxides was highest in Gothenburg, amounting to 39 and 40 per cent respectively. The figures were also relatively high in Hamburg, 17 and 32 per cent. Ships' share of volatile organic compounds was also high in Gothenburg, comprising 30 per cent of the emissions of these substances in that city.

Caution is however needed, says Saara Nummelin, in the interpretation of these figures. The actual port area may vary, and the extent of the emissions from other sources than ships will naturally affect their relative contribution.

Estimates of ships' emissions were entirely lacking for Copenhagen and Antwerp – which is especially remarkable in the case of the latter, seeing that Antwerp is the world's seventh largest port, and there have been investigations indicating that emissions from the port area do affect local air quality.

Of the ten cities that replied to the question of ships' contribution to the local concentrations of air pollutants, only Rotterdam could give any answer, and then only with widely spread-out data. For Hamburg's part the contribution of shipping to the concentrations of sulphur dioxide in the port area was estimated to be 5-10 $\mu g/m^3$ of a total of 19 $\mu g/m^3$, yearly average.

Nummelin concludes that the general attitude of the city authorities and air-management organizations, as well as port authorities, is that shipping does not have any great effect on the sum of concentrations of air pollutants in their cities.

The reply in several instances has been that other sources, and especially road traffic, are much more responsible. Many of those asked do however admit that the air in the vicinity of the port could be affected by the emissions from ships – as also appears from the available research.

"Even though the risk of exposure may be low in many cases for the city population as a whole, there will still be a lot of people living in the vicinity of the port, and the risk of these being exposed to the pollution from ships must be judged to be very high," says Nummelin.

She notes, as additional reasons for taking action, that the emissions from ships in international trade are also contributing to the exceeding of the critical loads for acidifying and eutrophying fallout, especially in coastal areas. They are also adding to the formation of ground-level ozone and small particles, with consequent damage to health.

Only Gothenburg and Helsinki had anything to say about what is being done in regard to emissions of air pollutants.

Gothenburg employs environmentally differentiated harbour dues, which in combination with the general Swedish system of differentiated fairway dues has induced quite a number of shipowners whose vessels are regularly entering the port to use fuel with a lower sulphur content. Some have also equipped their ships for catalytic cleaning of the exhaust gases. The harbour author-

Continued from previous page

ity is moreover encouraging ships to take electric power from land when in port. As result of various measures taken at the oil depot, the emissions of hydrocarbons have been greatly reduced. Plant for the recovery of gas when tankers are loading or unloading was put into operation early this year.

Helsinki charges environmentally differentiated harbour dues on the ferries that are regularly entering and leaving the port. Some of the larger ferries have installed catalyzers on their auxiliary machinery and systems for cooling their main engines with water. Some, too, have gone over to using fuel with a lower sulphur content.

Other places where some form of economic incentive is employed include, besides Sweden and Norway, Rotterdam, Hamburg, and Åland. And as reported in Acid News 3/01, Denmark is planning to do the same.

PER ELVINGSON

[1] **Luftföroreningar från sjöfart. Deras betydelse för lokala och regionala miljöproblem i Europa samt åtgärder**. Saara Nummelin. Project for the Department of Environmental Sciences Program, Gothenburg University, 2001. Swedish only, but with a summary in English.

[2] Gothenburg, Bergen, Copenhagen, Helsinki, Tallinn, Gdansk, Hamburg, Rotterdam, Antwerp, London, Barcelona, Marseilles, and Genoa.

To put pressure on shipowners

Determined measures to attack the problem of ships' emissions of air pollutants ought, according to a resolution passed by the Local Authorities International Environmental Organisation (KIMO), be taken by the EU and countries bordering on the North Sea. The KIMO is an organization for cooperation among a hundred or so local authorities of countries with coastlines along that sea.

In the resolution they urge the EU to make arrangements, without undue delay, for a marked lowering of the limit for the sulphur content of bunker oils. National governments are admonished to act unilaterally, for example by introducing measures to incite shipowners to switch to using low-sulphur fuels or to fit their vessels with equipment for reducing their emissions of nitrogen oxides.

Information: www.zetnet.co.uk/coms/kimo

Recovery may be all but impossible

Many of our activities are making marks on the environment that will take a very long time to heal, if it should be at all possible.

IN THE DEBATE on the effect of human activities on the earth's climate, it is often only the next hundred years that are considered . But that is not long enough, since what we are doing today will be felt for thousands of years ahead. Time, writes Claes Bernes in a recent study,[1] is an often forgotten factor when we try to estimate the effects of various disturbances of the environment.

Many of the effects we are having on the environment will tend to hang on. Even if their causes should stop, it will take a very long time, he says, for nature to heal the wounds we are causing – if indeed it will be at all possible.

As regards climate, Bernes notes that limiting the period of analysis to a hundred years, as is done in most cases, may be necessary for estimating the amounts of emissions during that period, but not for calculating the effects.

The fact that some of the industrial greenhouse gases (CFCs etc.) are very long-lived is not the primary reason making it necessary to consider the effects on climate over a period of several thousand years. Infinitely more important will be to see what is happening in the case of carbon dioxide, formed when we burn fossil fuels.

Single molecules of CO_2 do indeed become taken up relatively quickly by vegetation, while some get dissolved in the oceans. A net transport is now taking place from the atmosphere to the surface water of the seas, and thence into the depths. But equilibrium will eventually occur, and the transport back will be equally great. All the CO_2 molecules from emissions will thus remain in circulation and go on adding to an increase of concentrations in air or water over a very long period of time. The only part that will be neutralized is that which becomes fixed in the bottom sediment of the seas.

In other words, it will take a very long time, tens of thousands of years, before the concentrations in the air – and so the effect on the earth's radiation balance – become restored to their pre-industrial levels, even if the emissions of greenhouse gases should have stopped altogether.

Another drag on the climate system will come from the slowness with which the oceans warm up. Water expands when it gets warmer, and that will be going on for hundreds of years after the concentrations of greenhouse gases in the air have become stabilized at a certain level. Even if emissions should only be small in future, the sea level may have risen by as much as 1 to 2 metres in 500 years' time.

Nor is it impossible that there will be a great effect, over a thousand years, from the melting of land ice. The west-Antarctic icefield, which rests on ground below sea level and so is hardly firmly attached, could slide out to sea, causing a sudden rise in sea level of 5 metres. Although the Greenland ice could not move away so abruptly, its gradual melting would in time also result in a rise of 5 metres. There would hardly be likely to be a return of these ice masses to their present state before the next ice age.

In Bernes' view we ought to start reducing emissions without delay. Waiting for ten years before doing anything would not mean that the effects would hang on for ten years more, but that the concentrations of greenhouse gases in the air would continue to increase and the consequent disturbance become greater in all the tens of thousands of years during which their effect will remain.

"Although the present coal and oil-burning period cannot last so very long, its effects will be noticeable for

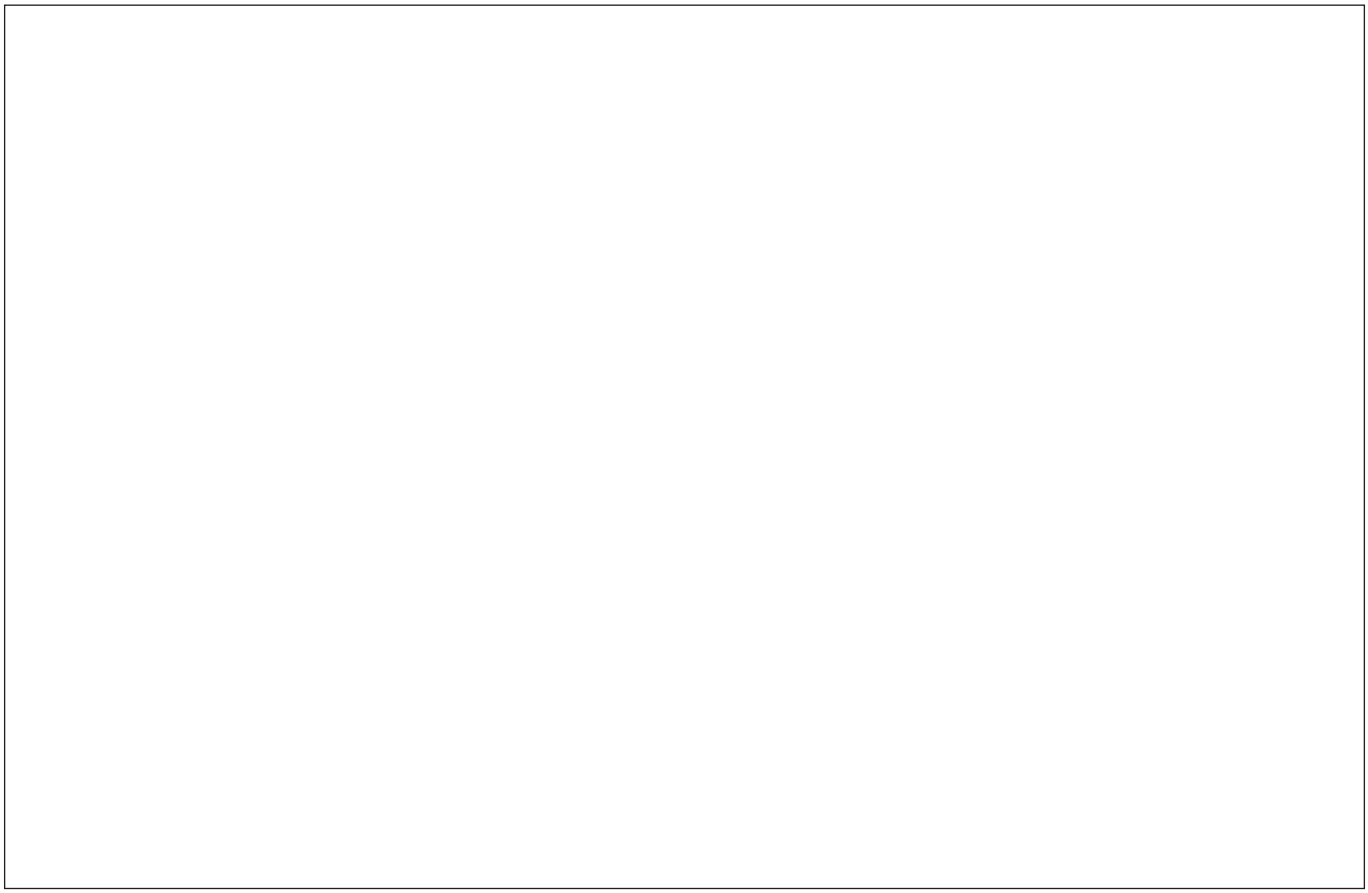

PHOTO: AUDIOVISUAL LIBRARY, EUROPEAN COMMISSION

The present era, with energy and transportation systems dependent on fossil fuels, will of necessity only constitute a short parenthesis in time, but the effects will remain over a very long period.

thousands of coming generations," concludes Claes Bernes.

He also considers the time factor as it affects two other problems with air pollution: acidification and the eutrophication of ecosystems.

As regards acidification, he notes that although there has been a great decline of emissions, the soil is still being subject in places to more acid deposition than it can stand in the long run – in other words, there acidification will continue to get worse, although not at the same rate as before.

There is also the fact that the very processes in the soil that had first counteracted acidification are now delaying recovery. The store of buffering substances that was then emptied has to be refilled, which may take decades if not centuries. But only after that has taken place will there be any noticeable improvement in the water chemistry of the affected areas.

Then there is the effect of removing biomass in forestry operations, which leaves a considerable excess of acid in the soil. In some types of soil that will be more than can be compensated by weathering, even if depositions should cease entirely. The biological recovery from the acidification of soil and water may take even longer than the chemical – since it will depend on the ability of plant and animal populations to recolonize their former habitats.

Soil still being subject to more acid deposition than it can stand

The flora will also take a long time to recover from the changes caused by depositions of nitrogen. When some nitrogen-favoured species has become well established, it can hang on for several decades after the additions of nitrogen have ceased.

Another trouble with nitrogen is that additions that have been taking place for several decades will have built up a considerable supply in the humus layer of forest soil. Almost the whole fallout of nitrogen, coming from our emissions of nitrogen oxides and ammonia, is either taken up by vegetation or becomes fixed in the soil. Sooner or later it will be released and cause trouble, by leaking out, for instance, and so contributing to the eutrophication of coastal waters.

A somewhat philosophical aspect on the matter of environment and time is how far we are responsible for the condition of life for future generations. It is true that the day will come when all life on earth will cease, say, after 500 million years, and then it won't matter what we are doing today. But, as Bernes asks, why should our responsibility for the condition of life for future generations not extend as far as that?

PER ELVINGSON

[1] **Will time heal every wound?** By Claes Bernes. Monitor 17. Published by the Swedish Environment Protection Agency, 106 48 Stockholm, Sweden. E-mail: kundtjanst@environ.se. Internet: www.miljobokhandeln.com.

Largely unchanged

The high remaining proportion of damaged trees is attributed to pollution and changing climate.

EARLY IN THE EIGHTIES extensive damage was noted in the forests of many European countries, air pollution being suspected as one of the causes. Then in 1985 an all-European survey was started to try and find out what the cause actually was.

Today the extent of defoliation is being recorded on more than 6000 permanent forest sites, with altogether 135,839 trees, set out in 16x16 kilometre grid covering the whole of Europe. There is furthermore extra surveillance of 860 plots where such factors as precipitation and air-pollutant fallout are also registered.

In the latest count, for the year 2000, 22.8 per cent of the trees were found to be damaged, i.e. had lost more than 25 per cent of their leaves or needles.

The percentage varies however from one species and one region to another, being lower than the average for instance in Scandinavia and on the eastern side of the Baltic. In some of the central European forests crown condition was found to be improving. But long periods of drought and forest fires have led to a sharp increase in the proportion of damaged trees in southeastern Europe. Crown condition has also deteriorated in those parts of central Europe where the fallout of pollutants is high.

A great number of so-called common sample trees – which have been studied every year for a considerable time – serve to reveal the long-term trend. It appears from the statistics so obtained that there had been a steady increase in total damage up to 1995, after which stabilization set in at a relatively high level. But there were still differences between species and regions.

It now appears from the monitoring that in most places the depositions of nitrogen are greater than these of sulphur. But because nitrogen is mostly taken up by plants and/or fixed in the soil, sulphur still accounts for most of the acidification. A noticeable leakage of nitrogen has only been found in limited areas in Germany and Belgium. Nitrogen has an acidifying effect only when it leaks out from the system. It is nevertheless a cause of concern, because any that has been stored in the soil can eventually leak out, and depositions can in any case affect biological diversity both above and below ground.

Extra attention has been given in this latest report to heavy metals. They are of interest because after storage in the soil they can become mobile again if acidification increases. But they are said not to be any great threat to most ecosystems just now. Cadmium, nickel, and lead are however exceeding their critical levels on 10-15 per cent of the sample plots, thus posing a potential risk to flora and fauna.

The fact that efforts to determine the cause of forest damage by statistical methods have so far yielded no clear-cut results can probably be explained by the great number of factors involved and the way they interact with each other.

The main result of the surveys to date is said to have been a clear indication that the physical and ecological conditions of forest systems in Europe have been influenced by the deposition of air pollutants over the past decades and by changing climatic conditions, with a series lately of warm and dry episodes as well as heavy storms.

PER ELVINGSON

Results from national forest-damage surveys, 1997-2000. Percentage of trees with defoliation >25 per cent.

	1997	1998	1999	2000
Albania	–	10	10	10
Austria	7	7	7	9
Belarus	36	30	26	24
Belgium	17	17	18	19
Bulgaria	50	60	44	46
Croatia	33	26	23	23
Czech Rep.	69	49	50	52
Denmark	21	22	13	11
Estonia	–	9	9	7
Finland	12	12	11	12
France	25	23	20	18
Germany	20	21	22	23
Greece[1]	24	22	17	18
Hungary	19	19	18	21
Ireland	14	16	13	15
Italy	36	36	35	34
Latvia	19	17	19	21
Lithuania	14	16	12	14
Luxembourg	30	25	19	23
Moldova	–	–	–	29
Netherlands[2]	35	31	13	22
Norway	31	31	29	24
Poland	37	35	31	32
Portugal	8	10	11	10
Romania	16	12	13	14
Slovak Rep.	31	32	28	24
Slovenia	26	28	29	25
Spain	14	14	13	14
Sweden	15	14	13	14
Switzerland	17	19	19	29
Ukraine	31	52	56	61
U.K.	19	21	21	22
Yugoslavia	8	8	11	8

[1] Excluding maquis. [2] In 1999 the number of plots was reduced from 200 to eleven.

[1] **Forest condition in Europe. 2001 Executive summary.** Available in pdf format and various languages at www.icp-forests.org. The printed version can be obtained from

SEEN IN ITS SETTING. After the International Cooperative Programme on the Assessment and Monitoring of Air Pollution Effects on Forests under the Convention on Long-range Transboundary Air Pollution had been started in 1985, the European Union adopted its Scheme on the Protection of Forests against Atmospheric Pollution a year later, and since then there has been close cooperation between the two. Today there are 38 countries participating in the monitoring program, with several others in process of joining it.

A biological asset going up in smoke

Although peat is of small importance as fuel, the bogs are being rapidly destroyed

PEAT FROM OVER 1,800 hectares of Ireland's dwindling bogs is to be milled as fuel every year for the next fifteen years in the name of "national security." And under a decision made by the EU Commission on October 30, 2001, the Irish consumer will be required to pay an extra 30 million euros a year until 2019 to subsidize burning of this, the dirtiest of fossil fuels.

Ireland has negotiated an agreement under which in return for closing six older peat-powered electricity stations, three new ones are to be built, which means cutting of the bogs will continue for another twenty years.

The OECD Report on Ireland for 2000 put it very bluntly:

"Peat is a subsidized energy source that emits a high level of CO_2 per unit of energy (1.6 kg CO_2/kWh electricity, compared with 0.5 kg CO_2 for a single-cycled gas-fuelled power station) as well as other pollutants, and whose extraction is environmentally damaging."

The use of peat for production of electricity has a triple greenhouse-gas effect through

❏ release of CO_2 from combustion, peat being the most carbon-intensive of fossil fuels,

❏ oxidation of unharvested peat from peatlands drained for extraction,

❏ removal of a sink which would otherwise continue to absorb carbon.

Ireland's NGOs came together to fight against the country's application to EU Competition Commissioner for permission to impose a Public Service Obligation on the national electricity supply board. The Commission did not listen to them.

Instead it quoted the "security of supply" clause in Directive 96/92/EC on the common rules for the internal electricity market. Article 8(4) states:

"Member States may impose on undertakings operating in the electricity sector, in the general economic interest, public service obligations which may relate to security, including security of supply."

This must not exceed 15 per cent of the national supply but as Ireland's use of peat as a fuel accounts for only 8 per cent of national needs, the potential destruction was approved through use of this loophole.

Aside from the effect of burning peat on global warming, these bogs are important on account of biodiversity:

❏ 15 per cent of Ireland's original native flora are peatland plants.

❏ 26 per cent of Ireland's mammals are dependent on peatlands at some point in their lifecycle.

❏ 59 of Ireland's species are totally or at some phases in their life dependent on peatlands.

❏ 49 per cent of all endangered birds in Ireland occur on peatlands.

❏ 23 per cent of the endangered plants in Ireland are peatland species.

All the larger bogs will be cut away within fifty years

This habitat has been brought to virtual extinction in the Netherlands, Germany, England, and Wales, leaving Ireland with 51 per cent of the intact raised-bog resource in the EU. But 82 per cent of the country's heritage of bogs has already vanished. Of its original 308,742 hectares of raised bog, 68 per cent has been cut for fuel.

Turf cutting in Ireland declined after the second world war with the increasing availability of electricity and oil. The situation was dramatically reversed in the 1980s with the development of turf cutters mounted on tractors and generous government subsides.

Mechanical turf cutting is relatively recent, but it is done on a scale that is fundamentally different from hand cutting. Traditional hand cutting works across a vertical face into the bog. Machinery exposes vast horizontal surfaces, cutting away all cover to leave desolate landscapes of cutaway bogs. All of the larger raised bogs will be cut away within fifty years.

The Global and International Affairs division of the Commission's Environmental Directorate shared the Irish NGOs' view that "from an environmental standpoint the burning of peat has a number of drawbacks," and that "cleaner and more sustainable energies should be promoted."

The best that the director could promise the NGOs, however, was that once the Kyoto Protocol was ratified, there would be "increasing pressure to find more efficient and cleaner energy systems which will not favour peat."

While the NGOs have lodged a protest against the proposed power stations with the Irish national planning appeals board, seeking at least some element of biomass, the fact of its being national policy usually assures any proposal a rubber stamp.

On the European front, a petition handed by the NGOs to the President of the Commission has yet to be heard and a parliamentary question tabled by Green MEP Patricia McKenna is still due for reply. But in the beginning of November the WWF joined Irish NGOs and called for a formal complaint against the decision of the Commission.

Article 174 of the Treaty Establishing the European Community states that community policy on the environment "shall contribute to the pursuit of the prudent and rational utilization of natural resources."

Irish NGOs are wondering if the Commissioners have read their own Treaty.

TONY LOWES

Director of Friends of the Irish Environment, Chairman of An Taisce's [the National Trust] Natural Environment Committee.

Loser takes all

EU ENVIRONMENT Commissioner Margot Wallström has lost a bet ... and yet in a way won it.

By putting her signature to the youth campaign entitled The Bet, she had agreed to cycle to work every day for a month if at least 88 schools managed to reduce their emissions by at least 8 per cent during eight months. Eighty-eight out of 300 did succeed. If they had not, they would have had to cart her to work by rickshaw for a whole week.

Although they failed to hit their other target – to reduce their overall emissions of carbon dioxide by 8 million kilograms – Wallström let it be and considered she had lost:

"Actually I had hoped to lose, and so let the environment win by taking on the bet," she said. "When fighting climate change we shouldn't forget what we as citizens can do in our everyday life. This is what the youth campaigners and all the participants in The Bet have demonstrated with their ambitious and enthusiastic initiative. If multiplied by millions, many small steps can make a big difference."

Most of the steps taken in this case by the schools were simple, inexpensive, and commonplace – such as lowering the indoor heating, mending leaky taps, switching to low-energy lamps, and improving insulation.

Wallström had signed at the time of the climate conference at The Hague. She now has to cycle about 5 kilometres to work, one way.

Further information: www.thebet.org.

New project for schools

The Secretariat's film, "Sex, sulphur and fishy business," is now being made over in six languages – Polish, Czech, Slovakian, Hungarian, Bulgarian, Romanian, and Estonian – by the Regional Environmental Center for Central and Eastern Europe (REC), which is preparing educational material on the environment for use in schools. All will be distributed as part of a project called "The Green Pack – environmental awareness for schools."

The pack, which will consist of several kinds of educational material, including video copies of the film, is to be made available free of charge to at least 1000 schools in each of the seven countries' –though not all at once. This year about 2000 packs are being sent to Poland. Next year it will be the turn of Hungary and Bulgaria, followed by the Czech Republic, Slovakia, Estonia, and Romania in 2003. Seminars will be arranged in each country to educate teachers in understanding of the environment and methods of teaching it.

Further information: www.rec.org.

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Coming events

Second International Conference on Plants and Environmental Pollution. Lucknow, India. February 4-9, 2002. *Information*: K.J. Ahmad, e-mail: isebnbrilko@satyam.net.in. Internet: www.icpep.org

World Sustainable Energy Day/Energy Globe Award 2002. Wels, Austria. March 7-10, 2002. *Information*: O.Ö. Energiesparverband, www.esv.or.at.

Urban Transport and the Environment 2002. Seville, Spain. March 13-15, 2002. *Information*: Conference Secretariat, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO40 7AA, England. Internet: www.wessex.ac.uk/conferences/2002/ut02/.

Fifth International Conference on the Protection of the North Sea. Bergen, Norway. March 20-21, 2001. *Information*: http://odin.dep.no/md/nsc/

EU Environment Council. March 21, 2002.

Working Group on Strategies and Review under the LRTAP Convention. Geneva, Switzerland. April 22-26, 2002. *Information*: www.unece.org/env/lrtap/conv/report/listofmeetings.htm

Seventh International Highway & Urban Pollution Symposium. Barcelona, Spain. May 20-23, 2002. *Information*: www.mdx.ac.uk/www/uprc/hway-sym7.htm

2nd International Conference on Improving Electricity Efficiency in Commercial Buildings. Nice, France. May 27-29, 2002. *Information*: ADEME, 500, route des Lucioles, F-06560 Valbonne, France. Internet: http://ieecbrl5.online.fr.

5th European Conference on Energy-Efficient Lighting. Nice, France, May 29-31, 2002. *Information*: ADEME, address as above.

EU Environment Council. Brussels, Belgium. June 24-25, 2002.

Air Pollution 2002. Segovia, Spain. July 1-3, 2002. *Information*: Conference Secretariat, Wessex Insitute of Technology, Ashurst Lodge, Ashurst, Southampton, SO40 7AA, England. E-Mail: lshouthcott@wessex.ac.uk. Internet: www.wessex.ac.uk/conferences/2002/air02/.

The Sustainable City 2002. Segovia, Spain. July 3-5, 2002. *Information*: Wessex Insitute of Technology, address as above. Internet: www.wessex.ac.uk/conferences/2002/urs02/.

World Summit on Sustainable Development (Rio +10). Johannesburg, South Africa. September 2-11, 2002.