

# Acid News

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## MULTI-EFFECTS

# Towards a protocol

GREAT ADVANCES were made towards a new, multi-effect protocol at the last meeting of the working group under the Convention on Long Range Transboundary Air Pollution at the end of January in Geneva. Agreement was reached in particular on a so-called central scenario, which is intended to serve as a basis for continued negotiations. It was further agreed that the new protocol should also call for still further reductions of the emissions of sulphur.

Although the preparatory work on this protocol has been going on for several years (see for instance AN 3/98, pp. 4-5), it was only at the meeting of the Working Group on Strategies, on January 25-28, that negotiations really got started. The aim is a simultaneous reduction of acidification, eutrophication, and the formation of ground-level ozone – to be achieved by setting

binding emission ceilings for each country for the four air pollutants that give rise to these problems, namely, nitrogen oxides, VOCs, sulphur dioxide, and ammonia. The deadline will be 2010.

Because the work on this new protocol started as a revision of the NOx protocol dating from 1988, many countries had been hesitant to let it include sulphur. Some were loath even to discuss any reduction of sulphur emissions beyond that prescribed in the 1994 protocol on sulphur. Since however that protocol had definitely come into effect in August 1998, these arguments became steadily less plausible – especially as it is written into the sulphur protocol that it shall be reviewed and revised in the year immediately following its coming into effect. There is also the point that the aims of the new multi-effects protocol can be at-

tained at a much lower cost if it also covers sulphur. It was therefore a logical decision of the Working Group to include sulphur.

During the preparatory work a number of scenarios had been produced and analyzed for future emissions, and it was agreed as early as a year ago that it would facilitate negotiations if one scenario was selected as a basis for their continuation. After a surprisingly short debate, one called G5/2 was chosen. Some countries, such as Belgium, France, Italy, Portugal, Slovakia, and Russia did indeed think that the scenario was aiming too high, proposing alternatives with weaker environmental aims, and so more lenient requirements for emission reductions.

The G5/2 targets for 2010 coincide largely with those aimed at by the EU Commission in working out

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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 fulfill 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:

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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 required reduction of the emissions of air pollutants. The eventual aim is to have those emissions 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 as follows, 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.

## EDITORIAL

# Why don't they?

WHAT is preventing the nations from presenting realistic and reliable scenarios for future energy use? It seems to be an unfortunate habit of forecasters to exaggerate the trend.

In much of the international work on air quality, in the EU as well as within the Convention on Long Range Transboundary Air Pollution, assessments have been used for many years to evaluate the various environmental targets and measures to reduce emissions. See AN 4/98 and the article starting on the front page of this issue. Since these evaluations have to assume some future situation, say in 2010, the expected use of energy at that time will be decisive for the outcome of the modelling. This concerns both the total amount of energy used and its attribution to various sources – coal, oil, nuclear, etc.

If the total of energy used – and especially the part generated from fossil fuels – is overestimated, the estimated cost of reducing emissions to a certain level will also be exaggerated. Moreover the computer will underestimate the possibilities of reduction, thus further weakening the hope for improvement during international negotiations for the reduction of emissions.

The scenarios that are now being used for the EU member countries, both when developing the new directive on national emission ceilings and in the negotiations within the Convention for a super-NOx protocol, are illustrative of what has just been said. The scenarios for ten of the fifteen countries have been produced by the countries themselves. The remaining five were worked out by the Commission's energy directorate, but approved by the countries concerned. As a result the use of energy in the EU as a whole is calculated to rise by almost 20 per cent from 1990 to 2010. An increase of 100 per cent is forecast for Greece, 71 per cent for Ireland, 59 per cent for Portugal, 45 per cent for Spain, 36 per cent for the Netherlands, and 30 per cent for Finland.

According to these same scenarios the total EU emissions of the greenhouse gas carbon dioxide will rise by about 9 per cent – in contradistinction to the commitments of the EU and its member countries under the Kyoto protocol, which requires them to *reduce* emissions by

8 per cent. In June 1998 it was decided, too, by the Council of Ministers how that 8 per cent was to be distributed among the member countries. It is also worth recalling that just before Kyoto the EU Commission had presented a cost effective strategy which would have reduced the emissions of CO<sub>2</sub> by 15 per cent. See AN 4-5/97, p.7.

As a part of the preparations for the coming directive on national ceilings for emissions of acidifying and ozone-forming substances, a very rough so-called low-CO<sub>2</sub> scenario was made – in an attempt to show, with the aid of sensitivity analyses, a more realistic energy scenario (at least as regards international commitments). That scenario would reduce CO<sub>2</sub> emissions in the EU by 7 per cent. It also showed that the environmental aims could be attained at more than 40 per cent less cost.

As indicated above, an attempt should also have been made to determine the environmental improvement (in the way of less acidification, less exposure to ozone, etc.) that could be attained at the same cost as that for the main scenario. But unfortunately that was not done.

This brings us back to the original question – why forecasts of future energy use always tend to be exaggerated – and so to the subsequent questions:

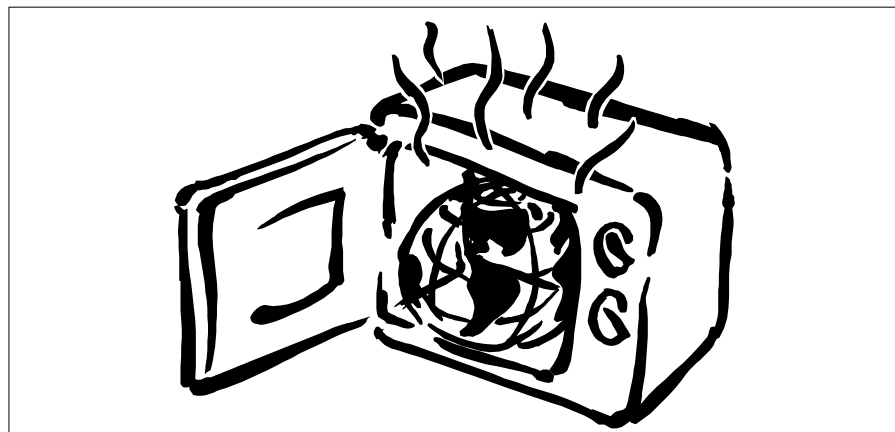
□ Why has none of the EU member countries produced an energy scenario reflecting its commitments to reduce emissions of greenhouse gases?

□ Why has the Commission not turned out a corresponding scenario for the EU as a whole?

For the suspiciously inclined, it lies close at hand to assume that the countries deliberately exaggerate their future energy use, so as to be able – by lowering the apparent potential for cutting down emissions and increasing the cost of doing so – to minimize the need to reduce emissions within their own territories.

But if a lot of countries do that, the general will for environmental improvement will inevitably be sapped. Let us hope that our democratically elected rulers will not be so deliberately dishonest.

CHRISTER ÅGREN



CLIMATE

## Meagre results at Buenos Aires

NONE OF the controversies surrounding the Kyoto protocol came nearer to solution at the fourth conference of the parties to the climate convention in Argentina in November. The only tangible result of two weeks of negotiating was a timetable for procedure during the next two years.

This plan of action laid down that the remaining obscurities of the protocol shall have been resolved by the time of the sixth meeting of the parties in October 2000.

One of the matters most debated before Buenos Aires was whether there should be any limit to the way a country could meet its commitments by resorting to "flexible mechanisms." The EU countries maintained that such mechanisms – joint implementation or trading in emission permits – could only be used as supplements to domestic action to reduce or limit emissions. Protests against this view came however from the "umbrella group" – United States, Japan, Canada, Australia, New Zealand, Russia, and Ukraine – with the result that the matter never came onto the agenda and so was shelved for the time being.

There are a number of other matters that will need clearing up before the conference in 2000. Among them are the compliance regimes, the role of carbon sinks, and the rules that are to govern the possibilities for industrialized countries to account emission reductions made in the developing countries as their own.

One controversial matter that drew particular attention, although it was not on the official agenda, was whether developing countries

should also have to make commitments to limit emissions. The Kyoto protocol only requires this of wealthy nations. But as a condition for ratifying the protocol, the United States is insisting that at least the more industrialized of the developing countries should be obliged to make commitments. And without US ratification it is unlikely that the protocol will ever come into effect.

Previously all the developing countries had shown resistance to the US demand. But at Buenos Aires the ranks were broken when Argentina, which was hosting the meeting, quickly followed by Kazakhstan, promised to present the commitments it was prepared to make during the fifth conference of the parties in Jordan this coming October.

Most of the environmentalist groups expressed disappointment at the meagre results of the Buenos Aires meeting. In the view of Delia Villagrasa of the umbrella organization Climate Network Europe, the worst part of it all was that nothing had been decided about reviewing the adequacy of the present commitments. The Kyoto protocol will only lead to a 5-per-cent reduction of emissions. The protection of human health as well as the environment will call for reductions that are many times that amount.

PER ELVINGSON

*Further information on the internet:*

- [www.unfccc.de](http://www.unfccc.de) (the Climate Convention),
- [www.climatenetwork.org](http://www.climatenetwork.org) (Climate Action Network).

The Kyoto protocol was described in *Acid News* 1/98, p. 4.

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In October the EU Commission's environment directorate presented a discussion paper suggesting that the Commission should develop an all-inclusive strategy for air-quality, gathering all aspects of the matter into a single program.

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Last December the EU Commission put forward a proposal for limiting the concentrations of benzene in the air. In many places great reductions will be needed to meet the proposed limit.

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By 1997 gas was almost equalling coal as a main source of energy in Britain. Distortions in the electricity market have encouraged the building of new power stations – thereby favouring gas over coal.

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In Britain the government has put forward a scheme to enable local authorities to impose road charging – as a means of alleviating traffic problems and also of raising funds for that purpose.

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Many ships entering Swedish ports now pay lower dues because they are burning low-sulphur oil. Reductions of the dues are also offered for ships installing equipment for cutting emissions of NOx.

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Taxes on motor fuels will have to be increased throughout the EU, as well as in the accession countries, if they are to cover some of the external costs of road traffic.

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A model has been developed for calculating the extent to which the emissions of air pollutants from one country are damaging the forests in others.

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Hitherto ground-level ozone has been mainly regarded as a problem for the industrialized countries. But modelling indicates a worldwide increase in its formation, even with significant reductions in the emissions of precursors in Europe and North America.

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its awaited directive for national emission ceilings, the so-called NEC directive (see Table 1 and also AN 4/98). The difference is that besides acidification and ground-level ozone the new protocol covers eutrophication. The fact that both the Working Group and the Commission are aiming at the same environmental targets should support, even if only indirectly, the Commission's proposals for the NEC directive.

Attainment of the G5/2 targets will entail considerable reductions of many countries' emissions, as can be seen from Table 2, which also

shows what is likely to be obtained as a result of already agreed measures (the reference scenario, REF). Information as to the way the fig-

*Attainment will entail considerable reductions of many countries' emissions*

ures have been arrived can be found in previous issues of Acid News, as well as in the reports prepared by the consultant, the International

Institute for Applied Systems Analysis.<sup>1</sup>

The cost of making these reductions has also been estimated for each country – the cost in each case representing the extra cost of measures needed to meet the new ceilings, i.e. over and above the measures already taken or having to be taken in order to meet previous commitments. The total for Europe under the G5/2 scenario is put at 9.7 billion ecus for the year 2010, of which amount the fifteen EU countries will be accountable for two-thirds, or 6.8 billion ecus. As in the case of previous IASA analyses,

**Table 2. Emission levels in 1990 and with the REF and the central (G5/2) scenarios. Percentage changes (in parenthesis) from the base year 1990. Figures do not include emissions from international shipping.**

	Sulphur dioxide			Nitrogen oxides (as NO <sub>2</sub> )			Ammonia			Volatile Organic Compounds		
	1990	REF	G5/2	1990	REF	G5/2	1990	REF	G5/2	1990	REF	G5/2
Austria	93	42 (-55)	42 (-55)	192	110 (-43)	85 (-56)	77	67 (-13)	65 (-16)	352	206 (-41)	151 (-57)
Belgium	336	208 (-38)	78 (-77)	351	199 (-43)	127 (-64)	97	96 (-1)	57 (-41)	374	195 (-48)	102 (-72)
Denmark	182	90 (-51)	48 (-74)	274	131 (-52)	118 (-57)	77	72 (-6)	69 (-10)	182	86 (-53)	86 (-53)
Finland	232	116 (-50)	116 (-50)	276	159 (-42)	159 (-42)	40	31 (-23)	31 (-23)	213	111 (-48)	111 (-48)
France	1250	489 (-61)	257 (-79)	1867	1017 (-46)	699 (-63)	805	798 (-1)	649 (-19)	2423	1256 (-48)	1036 (-57)
Germany	5280	660 (-88)	488 (-91)	2662	1256 (-53)	1040 (-61)	757	571 (-25)	412 (-46)	3100	1100 (-65)	891 (-71)
Greece	504	562 (+12)	562 (+12)	345	344 (0)	344 (0)	80	74 (-8)	73 (-9)	336	268 (-20)	262 (-22)
Ireland	178	70 (-61)	37 (-79)	113	73 (-35)	58 (-49)	127	126 (-1)	116 (-9)	110	55 (-50)	55 (-50)
Italy	1679	593 (-65)	316 (-81)	2037	1166 (-43)	846 (-58)	462	416 (-10)	356 (-23)	2055	1166 (-43)	1082 (-47)
Luxemb.	14	4 (-71)	4 (-71)	22	10 (-55)	9 (-59)	7	7 (0)	7 (0)	19	7 (-63)	7 (-63)
Netherl.	201	74 (-63)	53 (-74)	542	304 (-44)	215 (-60)	233	136 (-42)	106 (-55)	490	237 (-52)	161 (-67)
Portugal	284	146 (-49)	146 (-49)	208	181 (-13)	148 (-29)	71	67 (-6)	65 (-8)	212	144 (-32)	102 (-52)
Spain	2189	793 (-64)	760 (-65)	1162	866 (-25)	736 (-37)	352	353 (0)	353 (0)	1008	669 (-34)	648 (-36)
Sweden	119	67 (-44)	67 (-44)	338	195 (-42)	155 (-54)	61	48 (-21)	48 (-21)	492	283 (-42)	254 (-48)
UK	3805	980 (-74)	556 (-85)	2839	1186 (-58)	1163 (-59)	329	297 (-10)	264 (-20)	2667	1351 (-49)	1124 (-58)
EU 15	16345	4894 (-70)	3529 (-78)	13226	7197 (-46)	5901 (-55)	3576	3159 (-12)	2671 (-25)	14032	7133 (-49)	6073 (-57)
Albania	72	55 (-24)	55 (-24)	24	36 (+50)	36 (+50)	32	35 (+9)	32 (0)	31	41 (+32)	41 (+32)
Belarus	843	494 (-41)	494 (-41)	402	316 (-21)	290 (-28)	219	163 (-26)	140 (-36)	371	309 (-17)	298 (-20)
Bosnia-H	487	415 (-15)	313 (-36)	80	60 (-25)	51 (-36)	31	23 (-26)	22 (-29)	51	48 (-6)	48 (-6)
Bulgaria	1842	846 (-54)	355 (-81)	355	297 (-16)	261 (-26)	141	126 (-11)	108 (-23)	195	190 (-3)	189 (-3)
Croatia	180	70 (-61)	31 (-83)	82	91 (+11)	65 (-21)	40	37 (-8)	27 (-33)	103	111 (+8)	99 (-3)
Czech R.	1873	366 (-80)	279 (-85)	546	296 (-46)	175 (-68)	107	108 (+1)	101 (-6)	442	304 (-31)	222 (-50)
Estonia	275	175 (-36)	175 (-36)	84	73 (-13)	73 (-13)	29	29 (0)	29 (0)	45	49 (+8)	49 (+8)
Hungary	913	546 (-40)	296 (-68)	219	198 (-10)	118 (-46)	120	137 (+14)	73 (-39)	204	160 (-22)	153 (-25)
Latvia	121	104 (-14)	104 (-14)	117	118 (+1)	118 (+1)	43	35 (-19)	35 (-19)	63	56 (-10)	56 (-10)
Lithuania	213	107 (-50)	107 (-50)	153	138 (-10)	134 (-12)	80	81 (+1)	72 (-10)	111	105 (-6)	105 (-6)
Norway	52	33 (-37)	22 (-58)	220	183 (-17)	148 (-33)	23	21 (-9)	21 (-9)	297	195 (-34)	195 (-34)
Poland	3001	1525 (-49)	736 (-75)	1217	879 (-28)	646 (-47)	505	541 (+7)	474 (-6)	797	807 (+1)	513 (-37)
Moldova	197	117 (-41)	38 (-81)	87	66 (-24)	66 (-24)	47	48 (+2)	46 (-2)	50	42 (-16)	42 (-16)
Romania	1331	594 (-55)	205 (-85)	518	458 (-12)	306 (-41)	292	304 (+4)	227 (-22)	503	504 (0)	499 (-1)
Russia	5012	2344 (-53)	2197 (-56)	3486	2798 (-20)	2762 (-21)	1282	894 (-30)	894 (-30)	3542	2786 (-21)	2706 (-24)
Slovakia	548	137 (-75)	95 (-83)	219	132 (-40)	101 (-54)	60	47 (-22)	34 (-43)	151	140 (-27)	139 (-8)
Slovenia	200	76 (-62)	58 (-71)	60	36 (-40)	32 (-47)	23	21 (-9)	15 (-35)	55	40 (-27)	40 (-27)
Switzerl.	43	36 (-16)	36 (-16)	163	85 (-48)	81 (-50)	72	66 (-8)	63 (-13)	278	145 (-48)	145 (-48)
Maced. <sup>1</sup>	107	81 (-24)	81 (-24)	39	29 (-26)	29 (-26)	17	16 (-6)	15 (-12)	19	19 (+1)	19 (+1)
Ukraine	3706	1488 (-60)	1377 (-63)	1888	1433 (-24)	1206 (-36)	729	649 (-11)	589 (-19)	1161	851 (-27)	799 (-31)
Yugosl.	585	269 (-54)	242 (-59)	211	152 (-28)	134 (-36)	90	82 (-9)	67 (-26)	142	139 (-2)	139 (-2)
Non-EU	21599	9877 (-54)	7295 (-66)	10170	7873 (-23)	6832 (-33)	3980	3462 (-13)	3084 (-23)	8609	7042 (-18)	6497 (-25)
Total	37944	14771 (-61)	10824 (-71)	23396	15070 (-36)	12733 (-46)	7556	6621 (-12)	5755 (-24)	22641	14175 (-37)	12570 (-44)

<sup>1</sup> Former Yugoslavian Republic Macedonia.

**Table 1. Environmental quality targets for the central scenario.**

<b>Acidification</b>	
Gap closure on accumulated excess acidity	95% <sup>1</sup>
<b>Health-related ozone</b>	
Gap closure on AOT60	67%
Maximum AOT60 (to be achieved in 4 out of 5 years)	2.9 ppmh
<b>Vegetation-related ozone</b>	
Gap closure on AOT40	33%
Maximum excess AOT40 (average over 5 years)	10 ppmh
<b>Eutrophication</b>	
Gap closure on accumulated excess nitrogen deposition	60%

<sup>1</sup> For some grids in S Norway the target is 85 per cent.

these extra costs relate only to technical measures for reduction, and it is generally accepted that they are in consequence exaggerated.

The improvements for the environment will however be considerable:

□ The area of ecosystems where the critical loads for acidification are being exceeded would drop from 93 million hectares in 1990 to 18 million hectares in 2010 according to the REF scenario. Under G5/2 the total would fall to 8 million hectares.

□ Under G5/2 there would also be significant improvements for ozone. The estimates used by IASA indicate that in 2010 the excess exposure for population would be 78 per cent less than it was in 1990, or 43 per cent less than would be the case under the REF scenario. For vegetation, the exposure in excess of the critical level would be less than half of what it was in 1990, and about 25 per cent less than it would be under REF.

□ The area of ecosystems where the critical loads for eutrophication are being exceeded is estimated to drop from 165 million hectares, or 30 per cent of the total in 1990, to 94 million hectares or 17 per cent in 2010 – if emissions are cut in accordance with G5/2.

The gains for the environment are summarized in Table 3.

Estimates have also been made of the economic gains that would follow in the wake of G5/2. As in previous estimates of this kind, only such gains are considered as can be expressed in monetary

terms. Gains in the way of reduced damage to nature (from acidification and eutrophication) or to cultural objects, such as historic buildings and statues, have thus not been taken into account. Consequently the estimates relate mainly to the reduced effects on human health, although some gains in the form of reduced damage to crops, as well as to modern buildings and materials, have also been included.

For Europe as a whole the gain in 2010 is put either at 35 or 56 billion ecus a year, depending on the method used for assessing premature mortality. The higher figure results if VOSL, the value-of-a-statistical-life approach is used, while the lower comes from using VOLY, the value-of-life-years-lost concept. (Explained in AN 2/98, p.17). Despite the non-inclusion of important environmental benefits, as well as overestimation of the costs, the gains are reckoned to exceed the costs 4-6 times over.

The main business of the negotiators will now be to set levels for binding national emission ceilings for the four pollutants that the protocol is to cover. Many countries have wanted it also to include binding requirements for the control of emissions from additional major sources, such as large combustion plants and road vehicles (as in the 1994 sulphur protocol). Some wanted such requirements to be either in form of recommendations or fixed standards, but still to cover existing sources of that kind.

Since North America is not included in the advanced modelling work that is being done for Europe and is the basis for the negotiations

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that are now taking place, the United States and Canada will have to be a matter for some special treatment. And that is generally agreed upon. What is not yet clear however are the conditions that will enable these countries to sign the protocol.

Further meetings of the negotiators are planned for March, June, and September. If the new protocol is to be signed this year, it will have to have been largely approved by the time of the September meeting. If everything goes according to plan, the Convention will be able to celebrate its 20th anniversary by assembling a large number of environment ministers to sign the protocol in December in Sweden.

CHRISTER ÅGREN

<sup>1</sup> Emission reduction scenarios to control acidification, eutrophication and ground-level ozone in Europe. Part A: Methodology and databases. Part B: Emission reduction scenarios. By M. Amann et al, IASA, November 1998. Available on internet: [www.iasa.ac.at/~rains/tfiam22.html](http://www.iasa.ac.at/~rains/tfiam22.html). It is summarized in CLRTAP report EB.AIR/WG.5/1998/3 and Add. 1. The benefits analysis is summarized in the CLRTAP report EB.AIR/WG.5/1998/3/Add.1. Copies of CLRTAP reports can be had from the UN ECE Secretariat: e-mail address: [air.env@unece.org](mailto:air.env@unece.org).

**Table 3. Environmental improvement.**

	Acidification <sup>1</sup>			AOT60 <sup>2</sup>			AOT40 <sup>3</sup>			Eutrophication <sup>4</sup>		
	1990	REF	G5/2	1990	REF	G5/2	1990	REF	G5/2	1990	REF	G5/2
EU15	36963	6852	3557	1260	493	295	12412	7630	5800	66778	50489	38522
Non-EU	56315	11418	4531	305	105	46	9453	6025	4468	98498	69160	55850
<b>Total</b>	<b>93278</b>	<b>18269</b>	<b>8088</b>	<b>1566</b>	<b>598</b>	<b>341</b>	<b>21864</b>	<b>13656</b>	<b>10268</b>	<b>165276</b>	<b>119649</b>	<b>94372</b>

<sup>1</sup> Area of ecosystems with acid deposition above their critical loads for acidification (1000 hectares).

<sup>2</sup> Cumulative population exposure index (million persons.ppm.hours).

<sup>3</sup> Cumulative vegetation exposure index (1000 km<sup>2</sup>.excess.ppm.hours).

<sup>4</sup> Area of ecosystems with nitrogen deposition above their critical loads for eutrophication (1000 hectares).

## Sulphur in fuel oil

Last summer the Council of Ministers arrived at a common position in regard to the Commission's proposal for a directive to regulate the sulphur content of fuel oil. At a second reading, in the Parliament, the environment committee asked for stricter requirements on three points. Its proposals failed however to gain an absolute majority. The Council is therefore expected to stick to its common position (see Acid News 3/98, p.10).

## LCPs: revolt over directive

Spain is threatening to block the revision of the directive on emissions from large combustion plants that was proposed by the Commission in July 1998 (see AN 3/98, p.11). This became clear at the meeting of the Council's environment working group early in February. Like Italy and Greece, Spain does not consider it has any acidification problems, or cause any such in other countries. It is therefore unwilling to spend money on reducing emissions.

It is unusual, in environmental matters, to threaten with a veto at such an early stage of the proceedings.

Environment Watch: Western Europe. February 19, 1999.

## Better environment with new members

According to a communication from the Commission, the accession of Austria, Finland, and Sweden to the European Union has resulted in a strengthening of EU standards for the protection of the environment.

When these countries joined the EU, a special provision in the Act of Accession – the Review Clause – allowed them to keep some of their health and environmental regulations for four years, until December 31, 1998. In the meantime the EU had been reviewing its own health and environmental standards in close cooperation with the three new member states. In almost all cases the process of review resulted in the adoption of strengthened environmental standards throughout the EU – for example for sulphur in petrol, mercury in batteries, and the labelling of dangerous substances. In other cases the new member states will be keeping their present standards for some time – that being needed to continue the review and find solutions for the whole EU.

The Communication is available at environment directorate's homepage on:  
<http://europa.eu.int/comm/dg11>.

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### AIR QUALITY WORK

# Coordination proposed

JUST NOW much is going on within the EU Commission that will be of importance for improving air quality and lessening the depositions of acidifying and eutrophying substances. Besides standards for air quality, new limits are being considered for the emissions of pollutants from stationary sources, as well as standards for products such as fuels, and measures to curb emissions from mobile sources, such as cars and trucks. In most cases it is the environment directorate that has the main responsibility, working out proposals for directives in consultation with other Commission directorates. But there are fields, such as industry and transportation, where other directorates are in charge.

With the aim of achieving better coordination of its activities, the environment directorate has recently adumbrated a scheme for their better organization – presenting as a result in October a discussion paper<sup>1</sup> with ideas as to how work on air quality within the EU could be reorganized. The essential aim was to gather all the various activities that are now taking place within the Commission into a single program, with the suggested title of "Clean air in Europe." The kinds of air pollutants falling under this program would include sulphur dioxide, nitrogen oxides, volatile organic compounds, ozone, ammonia, particulates, polyaromatic hydrocarbons, and heavy metals.

Among the ideas put forward in the discussion paper were that:

□ the Commission should work out an all-inclusive strategy for air quality, to be reconsidered and re-

vised at regular intervals, say, of five years;

□ this strategy should extend the time perspective, making among other things for better coordination with current research;

□ the production, collection, and analysis of data (for example on air quality and emissions) should be coordinated. The development and use of computer models for scenario analyses should also be coordinated;

□ the transparency of the Commission's activities should be ensured, as should also the participation of various "stakeholders" (member countries, industrial groups, and other interested parties) in the Commission's work.

Among the items that could well be included in such a program are: Air quality (the framework directive as well as the forthcoming daughter directives). The acidification and ozone strategies. The second auto-oil program. The revision of the directive on large combustion plants. The IPPC directive. Measures for reducing emissions from shipping and aviation.

The discussion paper has been distributed to member countries, industry groups, and others likely to be concerned, with an invitation to provide comments. After consideration of the views so obtained, the Commission will present its conclusions, probably this year.

CHRISTER ÅGREN

<sup>1</sup> Discussion paper on future development of air quality policy in the European Union. Dated October 5, 1998. Available from Philip Stamp, DGXI/D3, European Commission, Rue de la Loi 200, B-1049 Brussels, Belgium.

# Lessening exposure to benzene

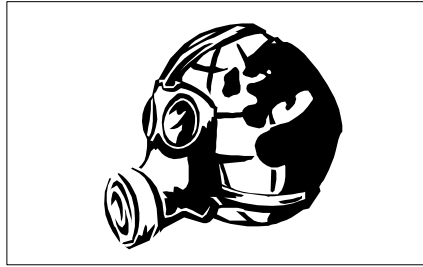
In some places a great reduction of emissions will be needed, even up to 70 per cent, if the Commission's new proposals for air-quality, which are admittedly aiming high, are to be realized.

Dating from last December, the Commission's proposal (COM(98)591), embracing carbon monoxide as well as benzene, is the second of daughter directives to the framework directive on air quality that was adopted in the autumn of 1996 (Directive 96/62).

It has been far from easy to decide on a suitable air quality standard for a carcinogenic substance such as benzene, since it is impossible to settle for any level under which there will be no risk from exposure. As a limit value for ambient benzene the Commission is proposing 5 micrograms per cubic metre of air ( $\mu\text{g}/\text{m}^3$ ), as a yearly average. The standard would have to be met throughout the EU by January 1, 2010, with no exceeding allowed. While admitting it is aiming high, the Commission maintains that its proposal will provide a high degree of protection, even though it may require some effort to meet it.

The Commission believes that by 2010 the emissions of benzene will have dropped by 60 per cent as a

result of measures already on the books, especially for vehicles and fuels – and that in most cases this will suffice to meet the limit. But in larger cities, and along heavily trafficked roads, further measures



may be required. In extreme cases emissions may have to be reduced by another 70 per cent.

It will be up to the member countries to decide what measures to take. The Commission points however to the possibilities of going in for alternative fuels and using road pricing to curb traffic – adding that traffic management can give many other important benefits, such as reducing noise and congestion and further reducing the emissions of

other pollutants, such as nitrogen dioxide and particulate matter.

A clause in the proposed directive would require member countries to start monitoring the air quality as soon as the directive comes into force. They will also have to develop and implement specific action plans to reduce benzene concentrations wherever and whenever these exceed a margin of tolerance that will be allowed until the time when limit must be met.

The margin of tolerance will start at 5  $\mu\text{g}/\text{m}^3$  above the limit, but will be progressively reduced from 2003 onward until the limit value becomes mandatory. The countries' action plans will have to be notified to the Commission and made accessible to the public.

Paradoxically, the proposal allows the possibility of postponing compliance with the standard where the concentrations are highest. Member countries that think the necessary measures would cause "severe socio-economic problems" can ask the Commission for an extra time-allowance.

For carbon monoxide the Commission is proposing a limit of 10 milligrams per cubic metre averaged over 8 hours, which accords with the WHO guideline for this pollutant. It will have to be met by 2005 and again may not be overstepped. Member countries will be required to draw up action plans to reduce concentrations if a tolerance margin is exceeded.

The limit value for carbon monoxide can probably be met everywhere without any difficulty, thanks to cleaner vehicles. The outdoor concentrations are a danger mostly to persons with heart and circulation problems.

PER ELVINGSON

Note. The first daughter directive, covering sulphur dioxide, nitrogen dioxide, particulate matter, and lead, is expected to be formally adopted by the Council of Ministers this spring. A proposed new daughter directive, for ozone, is expected in March. In the next few years the Commission will also be making proposals, in accordance with the framework directive, for PAHs and certain heavy metals.

## OZONE REPORT

### Limits exceeded everywhere

The EU ozone directive (92/72/EEC) gives rules for the way member countries are to measure concentrations and report to the Commission. At the end of last year a summary was published of the findings for 1997. Besides data from 984 monitoring stations in the EU, it includes figures from 100 others in Switzerland, Norway, Poland, the Czech Republic, Slovakia, and Latvia. It shows that:

- The threshold value set for the protection of human health (110  $\mu\text{g}/\text{m}^3$  as an 8-hour average) was exceeded substantially in all the reporting countries.
- The threshold values for the protection of vegetation were exceeded substantially in almost all the EU member countries. That of 65  $\mu\text{g}/\text{m}^3$  (24-hour average) was exceeded about threefold in all the reporting countries. Nearly all countries reported overstepping of the limit value during more than 100 days at one or more of their stations.
- The threshold value at which the public has to be informed (180  $\mu\text{g}/\text{m}^3$ ,

1-hour average) was exceeded in fifteen countries, including twelve EU member states. The warning level (360  $\mu\text{g}/\text{m}^3$ , 1-hour average) was passed at one station – in Athens, Greece.

The authors of the report have tried to figure out the extents to which the critical concentrations for vegetation, as well as for the WHO guidelines for health, have been exceeded. They found however that neither of these could be seen from the data provided in accordance with the directive. They also note that a wider geographical spread of the monitoring stations is needed, as well as better handling of the statistical material. Especially criticized for their poor reporting were France, Italy, and Spain.

<sup>1</sup> **Exceedance of EC Ozone Threshold Values in Europe in 1997.** Report to the Commission by the European Environment Agency Topic Centre on Air Quality. By Frank de Leeuw and Tim de Paus.

## Sustainable development and environment

The EU will have to make greater efforts to integrate sustainable development in all it undertakes, emphasized the heads of state of the EU countries in a communiqué from their Vienna meeting in December – calling among other things for comprehensive integration strategies from the councils of transport, energy, and agriculture ministers.

These strategies should include a set of indicators for measuring progress as well as a timetable for further integration measures. The communiqué also pointed to the need to include environmental considerations when deciding on reform of the common agricultural policy, as well as on the EU's regional development policy.

Commenting on the communiqué, the European Environmental Bureau (EEB) deplored the fact that the council of economic and finance ministers was not among those directed to start work on integration.

The communiqué is posted on the Council of Ministers' website at <http://ue.eu.int/newsroom/index.htm> (click on Latest News).

## Solvents in paints

Again at a second reading of the directive for organic solvents, the European Parliament urged inclusion of rules to restrict the solvent content of paints and other solvent-containing products for commercial or private use. The use of such products is estimated to account for 30 per cent of the total emissions of volatile organic compounds in the EU.

The Commission responded by saying that it had started work on the matter, but without indicating how long it would take. Its proposed directive includes rules for cutting down the emissions of VOCs from some twenty industrial processes by two-thirds from their 1990 levels.

## At least 5 per cent from renewables

Windpower Monthly reports that the Commission is preparing a directive that would call for at least 5 per cent of the electricity in each member country to be generated from renewable sources. The EU average is actually somewhat higher (5.5 per cent), but the proposal would mean a great increase for those countries that are now at the bottom of the list: Belgium, Ireland, Luxembourg, the Netherlands, and Great Britain.

## HEAVY DUTY VEHICLES

# Nearing a decision on emissions



IT SEEMS THAT the clash that had been expected between the Council of Ministers and the EU Parliament over the control of emissions from heavy-duty vehicles can be avoided after the ministers voted on December 20 for more stringent requirements than the Commission had proposed.

The Commission's proposal had been put forward in December 1997 (COM(97)627; see AN 1/98, p.7). As in the case of light vehicles and motor fuels, the Parliament had considered that limits should be set both for the year 2000 and 2005. The Commission had only wanted them for 2000. But instead of letting the matter go to conciliation, with subsequent compromise, the ministers chose to meet the Parliament halfway by agreeing to limits for 2005 without delay.

The political agreement that was reached in the Council in December involves tightening the emission limits for nitrogen oxides in three stages – from the present 7.0 grams per kilowatt-hour (g/kWh) to 5 grams in 2000, 3.5 in 2005, and 2.0 g/kWh in 2008. In other words, a final reduction of 70 per cent from present levels.

At its first reading of the Commission's proposal, the EU Parliament had wanted the 2.0 g/kWh limit to be set for 2005, but an extra three years would apparently have been necessary for reaching agreement among the ministers.

According to the text that was agreed by the ministers, the Commission is to have reviewed the technological feasibility of the NOx limit for 2008 at the latest by the end of 2002, and if need be propose changes. This is because there is some uncertainty among member countries as to whether the technique for limiting NOx emissions to the proposed extent will be ready for full-scale production at that date.

The limit for particulate matter is to be lowered from the present 0.15 g/kWh to 0.10 from 2000 and 0.02 from 2005 – a reduction of altogether

90 per cent. To attain the value for 2005, particulate traps will be needed.

The limits for emissions of hydrocarbons and carbon monoxide are to be lowered by 30 per cent by 2000, and 50 per cent by 2005, from today's levels.

The ministers also want the Commission to make proposals for making on-board diagnostic systems compulsory as from October 2005, as well as provisions to ensure the durability of emission control devices throughout the normal life of the vehicle. The Commission should also propose limits for the emissions of such pollutants as are not now regulated, but which may be expected to increase with the increased use of alternative fuels.

The ministerial document also allows the member countries of the EU to employ tax incentives as a means of speeding up the marketing of vehicles that meet the new standards.

This agreement among the ministers will be adopted as a "common position" at the next meeting of the Council, and thereafter sent to the Parliament for a second reading, all in accordance with the codecision procedure. It now remains to be seen whether the Parliament will accept the ministers' attempt at a compromise – which in several respects does not go as far as the Parliament has wished (as regards NOx for instance). Separate values for low-emission, so-called environmentally enhanced vehicles will be needed if the requirements for such vehicles are not to apply to all kinds, as the Parliament would like.

PER ELVINGSON

Note. The limits for 2000 are to apply from October that year for newly approved types of engine for heavy-duty vehicles, and to those for all such vehicles as are newly registered from October the year after.

The proposed directive is part of the auto-oil package, described in Acid News 3/98, p.9. For background and comment on various parts of it, see the Secretariat's website: [www.acidrain.org](http://www.acidrain.org).



# New accounting system will favour cleaner trucks

AFTER JUNE 30 it will cost more, in a number of EU countries, to operate trucks with poor exhaust cleaning. A decision came about when the EU transport ministers became ready to adopt a proposed directive following agreement with the Swiss over transit traffic last December.

At present six countries are imposing a charge on heavy trucks travelling within their territory (the Eurovignette, see AN 4/96, p.5, 2/97, p.5). The charge is now 1250 ecus per annum for all sizes of truck. But when the new, differentiated system comes into effect at half year, it will vary according to the

number of axles and the emission class. Still no account will be taken of the distance travelled. Here are what will be the maximum charges per vehicle:

	Max. 3 axles	Max. 4 axles
Euro 0	960 ecu	1550 ecu
Euro I	850 ecu	1400 ecu
Euro II and better	750 ecu	1250 ecu

Euro II is for vehicles meeting the emission standards from 1996, Euro I those from 1993, and Euro 0 for vehicles not meeting either of these.

## Correction

In the article headed "Old plants are the problem," on page 8 of the last issue of Acid News, the results were given of an IASA study to calculate the emission reductions that would be attained by 2010 if the EU Commission's proposal for a revision of its LCP directive were to be applied. Since the article was written, however, the IASA has made recalculations on the basis of fresh information, so that some figures have had to be changed – but only for nitrogen oxides; for SO<sub>2</sub> they remain as they were.

These latest calculations show that the proposed limit values for post-2000 plants would lead to a reduction of the emissions of NO<sub>x</sub> from such plants from about 150,000 to 85,000 tons a year by 2010. This means that the emissions of NO<sub>x</sub> from all LCPs (new and

old) would be about 6 per cent less in 2010 than they would have been if the directive had not been revised in accordance with the Commission's proposal (see table). But if all emissions of NO<sub>x</sub> are taken into account, not only from large combustion plants, the drop would only be about 1 per cent.

The main conclusion of the article still holds however – namely that "the Commission's proposals will only result in modest reductions, the reason being that far and away the greater part of the emissions from LCPs, both now and in 2010, will come from existing plants." According to the new IASA estimates, in 2010 85 per cent of the emissions of SO<sub>2</sub>, and 66 per cent of those of NO<sub>x</sub>, will come from plants built before 1987.

CHRISTER ÅGREN

### Estimated emissions of SO<sub>2</sub> and NO<sub>x</sub> from LCPs in the EU in 2010 (ktons).

SO <sub>2</sub>	— Age class —			Total emissions from LCPs
	pre-1987	1987-1999	post-2000	
Current legislation	1918	266	156	2239
1998 revision	1918	266	78	2261 (-3%)
Full penetration	324	121	78	523 (-78%)
NO <sub>x</sub>				
Current legislation	627	236	150	1013
1998 revision	627	236	85	948 (-6%)
Full penetration	217	134	85	436 (-57%)

## IN BRIEF



### Swiss transit agreement

The transport agreement that was arrived at between the EU transport ministers and the Swiss government after years of stalemate has been described by both parties as a breakthrough.

It means however that the Swiss government has had to drop much of what the country's citizens had voted for in a referendum last September (see AN 4/98, p.7). It has guaranteed for instance that the average charge for a 300-kilometre trip through Switzerland by truck will not exceed 200 ecus, and that it would moreover be kept down to a maximum of 180 ecus until the first of two new tunnels through the Alps had been completed (probably in 2007). It further gave dispensation for transit of a limited number of trucks up to 40 tons – 250,000 being permitted in 2000, with the number increasing up to free access in 2005.

Immediately after the agreement was made public, seven prominent environmentalist organizations declared it in a joint statement to be unacceptable, since it would mean more trucks thundering through Switzerland, not fewer. It is not unlikely that there have to be another referendum.

Source: T&E Bulletin No. 74. December 1998.

### Protests against Greek lignite

The Former Yugoslavian Republic of Macedonia is planning to import 0.6 to 1.6 million tons of high-sulphur lignite a year from Greece. It hopes, by burning it in a power plant at Bitola, near the Greek border, to be able to sell the electricity to Greece at a profit of US\$10 million. But Macedonian environmentalists have voiced strong opposition to this deal, since the result will be to increase the level of pollution in FYR Macedonia itself. They say that the fuel cannot be used in Greece because of the environmental controls in that country. Greek coal and power interests would be the gainers, like the FYR Macedonian power producers, while Greece could circumvent EU legislation by moving pollution across the border. The losers would be the human population and the environment, especially in FYR Macedonia, where the effects would be worst.

Source: Green Horizon. February 19, 1999.

# Britain dithers between fuels

The following has come from a close observer of the power scene in Britain

During the last decade the UK power industry has undergone enormous changes – with privatization and restructuring in the generating, transmission, and supply sectors, a progressive tightening of emission controls, and a “dash for gas.”

The dash for gas began after 1990. While the use of oil had been declining and nuclear power increasing during the seventies and eighties, coal had retained a two-thirds share of generating capacity until well into the nineties. But by 1997 gas was almost equalling coal as a main source of energy.

It might easily be assumed that this development was due to the tightening of emission controls. In 1991, National Power and Power-Gen, which were then the two major generators, were allowed to emit a combined total of 2680 kt (kilotons) of sulphur dioxide – which would hardly have been lower than their 1980 total of 2776 kt. In contrast, the allowance for 1997 was 1500 kt, to be further reduced to 500 kt by 2001 and 365 kt by 2005. (1)

Throughout the 1990s, however, the actual emissions have been well within the permitted limits (2). While this would not preclude a causal relationship between pollution controls and the dash for gas, it does suggest a possible effect of other factors. The government has in fact identified distortions in the electricity market that occurred during the privatization and restructuring of the industry in the early nineties, and concluded that these have been the main influence favouring gas over other fuels (3).

Distortion was found to have occurred in two ways, which both overlapped and reinforced each other. For one thing the wholesale market for electricity (the Pool) has operated in such a way as to affect competition between different types of fuels and between existing plants and new ones. Then, because of inadequate competition, the wholesale prices of electricity have been higher than they need have been. These trends have, in combination, encouraged the build-

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ing of new power stations – thereby favouring gas over coal. A new gas plant draws a cost of 2.0 p/kWh as compared with 3.0 p/kWh for a new

*Emission limits are likely to have greater effects after 2000*

coal-fired plant. If there were no such distortions, new gas-fired plants would have to compete with existing coal-fired capacity which, at 1.6 p/kWh, has the cost advantage.

The government had regarded the switch to gas as a useful way of less-

ening the dependence on coal. But it now believes that if the trend were to continue, it would again result in an overdependence on one fuel – this time gas. It is therefore imposing a moratorium on consents for new gas-fired stations, while it deals with the distortions in the electricity market. It will use the moratorium to radically reform the Pool, and will require the major coal-fired generators to sell off some of their capacity. National Power consequently announced in November that it would be putting its huge 4 GW, FGD-equipped Drax power station up for sale. Power-Gen is likewise planning to dispose of 4 GW of capacity, probably at Ferry Bridge and Fiddler's Ferry.

Although emission limits have not been mainly responsible for reductions during the nineties, they are likely to have greater effect after 2000. National Power has estimated that by 2001, only FGD-equipped coal-fired stations will be able to operate at base load. All plant not so equipped will have to stay on reduced load (4). The resulting environmental benefits will however be somewhat offset by generators continuing to run coal-fired stations beyond

DRAX POWER STATION ©CHRISTER AGREN

**Shares of fuels in power generation (in per cent) in England and Wales.** Source: (3).

	1970	1975	1980	1985	1990	1995	1997
Coal	72	67	80	66	70	46	34
Oil	18	19	9	14	4	1	0
Gas	0	4	0	0	0	20	30
Nuclear	9	10	11	17	18	23	25
Hydro etc.	0	0	0	1	1	1	1
Imports	0	0	0	2	8	9	9
Total (TWh)	186	205	216	230	267	283	281

the previously anticipated end of their lifespans, in 2010.

This is particularly frustrating for environmentalists, who have been thwarted, in their attempts to get FGD retro-fitting enforced, by the generators claiming only short remaining lifespans for their coal-fired stations. Environmental controls in the UK depend heavily in Best Available Techniques Not Entailing Excessive Costs (BATNEEC), which balances possible environmental controls (BAT) against the costs to the operator (NEEC). In 1996 the Environment Agency accepted claims that it would be excessively costly to retro-fit stations for flue-gas desulphurization if they were to be shut down by 2010. The agency did however envisage a review of this decision if plant lifespans were nevertheless extended (5). Although they are now being extended, their having to run on reduced loads is likely to again result in swinging BATNEEC assessments against the retro-fitting of FGD to coal-fired stations.

Environmentalists have tried to offset this by arguing that the costs to health and from acid damage, which are now known, should be included in the BATNEEC assessments. But that has not been accepted. Instead the government is awaiting the results of an Environment Agency consultation on the possibility of tightening emission controls.

Under UK law, if BATNEEC allows coal-fired power stations to continue operating without FGD, then this can only be overridden by the country's obligations under international treaty.

So far, however, these obligations have proved significantly weaker than the limits arising from BATNEEC assessments. Up to 2005, the BATNEEC limits on three UK generators alone – National Power, PowerGen, and Eastern Generation – will be tougher than any required by the country's treaty obligations, and this had led the government to consider weakening the emission limits for power stations as a way of assisting the coal industry. But as Friends of the Earth pointed out, this would have been unlawful under the 1990 Environmental Protection Act, which requires that limits meet *both* international treaty obligations *and* BATNEEC. Consequently the government is now allowing the limits to remain as they were.

Nevertheless, this fact that the government was considering using treaty obligations as an excuse for slackening the emission limits for power stations underlines not only the uphill struggle facing environmentalists seeking challenging new targets for acidification, but also the complexity of forces currently at work in the UK power industry – an observation that is only strengthened by another fact, that the Environment Agency was at the same time considering a proposal to tighten those very limits.

LESLEY JAMES

The writer is Acid Rain Campaigner for Friends of the Earth England, Wales, and Northern Ireland.

#### UK TRAFFIC

## Local road charging to remedy congestion

EARLY IN DECEMBER the British government put forward a scheme to enable local authorities to introduce road charging as a means of reducing congestion, and also to tax company parking facilities to cut down commuting by car.

The proposal, hopefully named "Breaking the logjam", is a sequel to the white paper on sustainable transportation that was presented in July (see AN 3/98). It sets out a framework for legislation that has still to come.

The aim is on the one hand to get rid of traffic jams, and on the other to raise funds to enable local authorities to carry out needed schemes of their own for alleviating traffic problems, said John Prescott when presenting the proposal. (Prescott is both deputy prime minister and environment minister.) "We know traffic jams cost, and they don't just hit the economy but society and the environment as well," he noted. John Reid, former transport minister, added that with traffic expected to grow by up to 50 per cent over the next twenty years, action was needed. "It's now slower getting across London by car than it was a hundred years ago by cart," he threw in.

According to Prescott the latest proposals would generate an income of about £1 billion a year. He thinks road charging could start

#### References:

- (1) *Energy and Environment No. 61*, ENDS Report 254, Environment Data Services Ltd. March 1996.
- (2) *UK Energy and Environment*, p.28. Cambridge Econometrics, June 1997.
- (3) *Conclusions of the Review of Energy Sources for Power Generation and Government Response to the Fourth and Fifth Reports of the Trade and Industry Committee*. Department of Trade and Industry, October 1998.
- (4) *National Power's Performance Improvement Plan for Drax Power Station*, 1996.
- (5) *Proposals for Reducing Emissions of Polluting Substances from Existing Coal- and Oil-fired Power stations: A Consultation Paper*. Para 60. The Environment Agency, January 1998.

within two or three years, probably first in London. But decisions will have to be made locally.

Prescott's proposal was not exactly welcomed by the motorists' organizations. The chairman of the Association of British Drivers, Brian Gregory, said that motorists already paid £33 billion a year in taxes, and that "new taxes are unacceptable when the existing ones are already too high."

Environmentalists were also critical, although for different reasons. Friends of the Earth support the idea of congestion charges and the taxing of non-residential parking, but call for concrete proposals. They are also critical of the government's plans to introduce charges on the motorways, because drivers will then choose other routes, which will be worse, since they are likely to go through villages and small towns.

The proposal has been circulated to all local authorities, with an invitation to send in comment before March 31.

MAGNUS NILSSON

*Breaking the Logjam* (product code ILT0488) can be ordered from DETR Free Literature, P.O. Box 236, Wetherby, West Yorkshire, LS23 7NB, United Kingdom. Fax +44 870 122 6237. Also available at the website of the Department of Environment, Transport, and the Regions: [www.detr.gov.uk/itwp/logjam/index.htm](http://www.detr.gov.uk/itwp/logjam/index.htm).



## Norway

Foreign registered ships entering Norwegian ports in 1996 emitted about 6000 tons of sulphur dioxide. Emissions from the whole Norwegian transport sector amounted that year to 4400 tons, of which Norwegian shipping accounted for 3000 tons. Thus the emissions from foreign vessels were about twice as great as those from Norwegian ships, despite the much greater movements of the latter in Norwegian waters.

This is because all foreign vessels with engines of 2000 kW or more run on bunkers with an average sulphur content of 2.7 per cent. The bunker fuel sold in Norway has a sulphur content of 1 to 2 per cent, but most Norwegian ships use diesel fuel, with a sulphur content of less than 0.1 per cent. The figures do not include ships passing through Norwegian territorial waters without entering a Norwegian port.

Source: Statistics Norway, [www.ssb.no](http://www.ssb.no).

## Doing it well

More and more business corporations are checking the effects on the environment at every stage of their activities. During the last decade great efforts have been made in the Swedish pulp and paper industry to reduce emissions from stationary plant. But when SCA Graphic Paper sized up its effects about a year ago, it found the emissions of acidifying substances from its transport activities to be greater than those from its plants. To improve matters, the company has gone over to using low-sulphur fuel in its three ships, and is now also in process of installing SCR on them, to deal with nitrogen-oxide emissions. And it pays to do so because of the system of differentiated harbour and fairway dues that is now functioning in Sweden. The result will be to reduce the sum of the yearly emissions of sulphur dioxide and nitrogen oxides from the company's three vessels by 1000 and 1400 tons respectively.

## Emphasizing sustainability

Last year the Organization for Economic Cooperation and Development (OECD) decided to make sustainable development a main pillar of its work. This aspect will henceforth be observed in all the reviews it makes of its member countries' economies. In a pilot study that has just been made for Norway it notes that the country "could integrate environmental objectives more objectively into overall policy decisions."

ENDS Daily, February 22, 1999

## DIFFERENTIATED DUES

# A fair exchange for shipping

The operators of almost 1100 ships normally entering Swedish ports have agreed to use low-sulphur fuel oil – and in return pay lower fairway and harbour dues. The possibility of extending the system to the European Union generally is now being examined at the behest of the Commission.

The Swedish system using differentiated charges was introduced in January 1998. It applies to all vessels entering Swedish ports, of no matter what nationality. It would seem that the system has had the desired effect in respect of sulphur emissions. Although only 1100 of the 3500 vessels entering Swedish ports last year had acquired the certificate giving the right to lower dues, the remaining ones seldom come to Sweden and so make up for no more than a small part of the total traffic.

Exactly how much the emissions of sulphur have fallen as a direct result of differentiation is for the moment impossible to say – partly because many of the big ferries were already running on low-sulphur fuel before the system came into effect. An assessment is however to be made.

Harbour and fairway dues are also differentiated according to the ships' emissions of nitrogen oxides (see box). Here however progress has been slower. So far only six ships have been certified for lower dues, but according to Stefan Lemieszewski, environment officer at the National Maritime Administration, more are on the way to it.

To obtain the full reductions for NOx, ships have to be equipped for SCR (selective catalytic reduction), which takes time to install as well as being expensive. So to hasten developments, the Administration is offering a remittance of part of the fairway dues as a means of covering some of the cost of installation (40 per cent if the change is made before 2000, and 30 per cent if it is done in 2000 and 2001).

"The dues will be revised after a review of the system has been made later this year," says Lemieszewski, adding: "The scheme will doubtless gather real momentum only after other countries have joined in."

And that is just what seems to be happening. According to Sveinung Oftedal, of the Norwegian department for the environment, a proposal for differentiated dues is already being prepared for Norway, with hope of a decision before the year is out.

Recently the EU Commission has also called for an investigation of the legal possibilities of employing financial instruments as a means of bringing down the emissions of air pollutants from shipping, and a report is due before the end of the year. Lemieszewski believes the

## The Swedish system

### Fairway dues

**SULPHUR.** Ferries burning fuel oil with a sulphur content of more than 0.5 per cent have to pay a charge of 0.90 kronor per gross ton every time they enter a Swedish port. There is no charge if the sulphur content is less than 0.5 per cent. For all other types of vessel the limit is 1 per cent.

**NITROGEN OXIDES.** If the emissions are 12 grams or more per kilowatt-hour (calculated as NO<sub>2</sub>) the full charge of 4.10 kronor per gross ton will be payable (4.40 for bulk carriers of mineral-oil products).

For lower emissions the charge is reduced on a linear scale down to 2 grams per kWh, ending at 2.50 (or 2.80) kronor.

### Harbour dues

By agreement with the Maritime Administration and the shipowners' association, harbour dues have also been differentiated, thus compounding the effect of the system. Harbour dues bring in about four times as much income as fairway dues. Most of the main ports in Sweden have associated themselves with the system. But each harbour authority sets its own dues.

prospects are good for a general application of differentiated dues, even by those countries bordering on the Baltic Sea which are now lining up for EU membership.

At the same time work is going on within the IMO, the International Maritime Organization, the UN body that is responsible for seafaring matters. There the process culminated in 1997, with the adoption of an air-pollution annex to the MARPOL Convention (reported fully in AN 4-5/97). That annex sets a ceiling for the sulphur content of bunker fuel – unfortunately so high as to have only a negligible effect. A gain on the other hand was the declaration of the Baltic Sea as an SOx Emission Control Area, where ships may only use fuel oil with a maximum sulphur content of 1.5 per cent.

Because of the lengthy procedures within the IMO, it may take years before the annex can come into effect. The matter of making the North Sea too an SOx emission control area will probably come up for discussion at the meeting of the organization's Marine Environment Protection Committee this summer, but it is also possible that the application of financial instruments, together with an increased call for environment-friendly modes of transportation, may have made the IMO rulings past history by the time they come into force.

Politicians have every reason to force the pace. Studies made for the EU acidification strategy have shown that measures in the shipping sector would be highly cost-effective, compared with what it would cost to pursue still further measures on land. According to Stefan Lemieszewski, the cost of cutting down emissions of nitrogen oxides from ships amounts to something between 3 and 7.5 kronor per kilogram – as against up to 40 kronor per kilogram for many of the measures that are now being taken on land in Sweden.

**PER ELVINGSON**

The Swedish system was described in detail in Acid News 1/98. Further information can be obtained from Sjöfartsverket, att. Stefan Lemieszewski, 601 78 Norrköping, Sweden. E-mail: stefan.lemieszewski@sjofartsverket.se. Details of the emissions of air pollutants from shipping have been assembled on the Secretariat's website: [www.acidrain.org](http://www.acidrain.org) (select heading "Current news"). There is also a folder, entitled *Cleaner shipping*, which is obtainable free of charge from the Secretariat.

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#### MOTOR FUEL TAXES

## Need raising most in accession countries

FROM OFFICIAL FIGURES it appears that the taxes on motor fuel, and not least diesel, will have to be increased throughout the EU – if they are to be brought up to a level where they will cover the so-called external costs of road traffic. Still greater increases will be needed in those countries that are now applying for EU membership. The taxes will not only need to be raised, but also harmonized – for the benefit of the environment as well as to ensure competitive equity.

The way these aims can be accomplished are examined in a report<sup>1</sup> by Per Kägeson, commissioned by the Swedish NGO Secretariat on Acid Rain and T&E, the European Federation for Transport and Environment.

The report starts out from an overview of current taxation together with fuel prices at the pump in many European countries. It reveals very considerable differences. At 0.39 ecu per litre, petrol is cheapest in Lithuania and Romania and dearest in Norway, where it costs the equivalent of 1.02 ecu. Diesel is also cheapest in Lithuania, at 0.22 ecu per litre, but dearest in the UK at 0.84 ecu (figures for diesel are without value-added tax).

Despite these great differences, a stepwise harmonizing of fuel taxes up to 2010 would not, according to Kägeson, have any marked economic effects, even in countries where the greatest increases will be needed. For the accession countries in the east Kägeson proposes a transition period extending at the most up to ten years – while also emphasizing the importance of their moving towards harmonization from the

start. Unless that is done, there will be a danger of having to allow lower taxation for a longer time in the accession countries, thus upsetting the development of the common market. Otherwise all the present EU members would have to wait for the new members to catch up. And that would greatly delay the transition to an environmentally adapted transportation system.

One of the main conclusions of the report is that the present EU members should agree without further delay to the proposal for fuel taxes that was presented by the Commission in 1997. Unless they do, there will be no basis from which to negotiate new taxes and harmonization.

Kägeson also discusses the least common level for future EU fuel taxes. His recommendation is that the minimum level should be increased in stages, and that the tax on diesel should be increased most. At present diesel is taxed lower than petrol everywhere except in Britain, despite the fact that diesel has the more deleterious effect both on health and the environment.

Harmonization will also require a rise in the taxation of heavy vehicles in the accession countries. Sample calculations in the report show however that the economic effects would not be remarkable in this case either – partly because wage costs today are much lower in those countries than in the present EU.

<sup>1</sup> **Road Fuel and Vehicles Taxation in Light of EU Enlargement.** T&E Report 99/2. 20 pp. BEF 300. Available from the European Federation for Transport and Environment, Bd. Waterloo 34, 1000 Brussels, Belgium. Fax. +32-2-502 9908. E-mail: [t+e@arcadis.be](mailto:t+e@arcadis.be).

# Exporters of acid identified

IN AN ATTEMPT to see which country in Europe manages its forests best the World Wide Fund for Nature has developed an index, named WWF European Forest Scorecard. In this index social and cultural aspects are taken into account, as well as environmental factors.

A factor that has received scant attention, despite its considerable effect on forests, is air pollution. This article describes an attempt that is being made to determine the extent to which air pollutants emitted in one country are having adverse effects on the forests in other countries as well as its own. Where countries are causing damage in this way it should be reflected in the scorecard ratings.

The only effect of air pollution that is being considered at the start of the project is acidification. This does not mean however that other effects, such as damage from ozone, are regarded as negligible. But when forest soils become acidified, essential nutrients will be leached out, eventually threatening forest productivity. Moreover, by reducing the diversity of plant species, the depositions of sulphur and nitrogen compounds greatly change and impoverish ecosystems.

To be of practical use, an acidification index has to be based on current data and be reasonably simple. The latest data, for 1995, from the Coordination Center for Effects of the Convention on Long Range Transboundary Air Pollution, shows 8 per cent, or almost 30 million hectares of Europe's forests, to be exposed to depositions that exceed the critical loads for acidification. So that despite substantial improvement since the late 1980s, the situation is still far from satisfactory.

The index shows a handful of countries to be the chief sinners. Moreover emissions from within Europe are back of 94 per cent of the areas where critical loads are being exceeded. Emissions from international shipping and so-called unidentified sources explain the effects on the remaining 6 per cent.

Exceeding the critical loads is assumed to indicate damage. The calculations for critical load have been scientifically derived to show

how much ecosystems can tolerate, in the way of depositions of sulphur and nitrogen compounds, without suffering long-term damage. Exceeding the critical loads will mean there is a high risk that damage will occur, either sooner or later.

To link the sources of emissions to depositions in excess of the critical loads, international budget calculations for sulphur and nitrogen

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compounds are used, taken from the Europe-wide EMEP program. These include data on the emissions, transformations in the atmosphere, transports, and depositions of the pollutants. All forest areas where the critical loads are being exceeded are linked to some emitter country or other source. A proportional relationship is assumed between the deposited pollutants and the areas where the critical loads are being exceeded. Thus, if a country A is deemed to account for 20 per cent of the acidifying depositions in country B, country A is assumed to be responsible for 20 per cent of the forest area in country B suffering above-

critical loads for acidification. Finally, the areas where the critical loads are being exceeded are summed up for each country, and divided by the total area for Europe with excess loads. The index figure shows the percentage of the total forest area of Europe for which each country is responsible for the critical loads being exceeded.

Simply using excess deposition is of course somewhat crude, taking no account for instance of the size of the excess, nor of the fact that even depositions below the critical loads can cause changes in forest ecosystems.

The acidifying substances on which the index is based are sulphur and oxidized as well as reduced nitrogen compounds (SO<sub>2</sub>, NO<sub>x</sub> and NH<sub>3</sub>). To compensate for temporary aberrations in the weather, budgets for the average transfers of pollutants in 1994-96 have been calculated for each of the three substances. The budgets for SO<sub>2</sub>, NO<sub>x</sub> and NH<sub>3</sub> are then merged according to their potential acidifying effect. It should be noted that for nitrogen there is a difference between its potential and actual acidifying effect. As regards potential acidification, it is assumed that none of the deposited nitrogen is taken up by plants or immobilized in the soil, although the actual acidifying effect will depend on the degree of uptake by living plants. A high uptake usually lowers the acidifying effect. On the other hand a high biological growth, coming from an abundant supply of nitrogen, reduces the amounts of free base cations in the soil, thus increasing acidity.

The assumption of proportionality between the area where critical loads are exceeded and the reported depositions may be the weakest side of the index. The reality may be far more complex. Varying geographical conditions and soil types within a country may be two influential factors. So far, however, proportionality seems to be the best assumption. The EMEP model that is used for calculating pollution budgets is being continuously developed and improved, as is the input data. Thus better data may soon become available for the acidification index, enabling the

sources of emissions to be more closely attached to the areas with above-critical loads.

To illustrate from the table: In Germany the critical loads for acidification are being exceeded on 67 per cent of the country's forested area. That means 7.2 million hectares out of a total of 10.7 million. On the other hand emissions from German sources are causing the critical loads to be exceeded on some 6.9 million ha of forest land in Europe – that is on 24 per cent of

the total forest area where critical loads are being exceeded.

ERIK SOLLANDER

European Forest Scorecard Coordinator, WWF International. Tel/Fax: +46 392 123 99. E-mail: erik.sollander@telia.com.

Sources:

Max Posch, CCE/RIVM, National Institute of Public Health and the Environment, Netherlands.

Temperate and Boreal Forest Resource Assessment (TBFRA) 2000 and 1990.

EMEP/MSC-W. Report 1/97.

## Recent publications

### Assessment and Management of Urban Air Quality in Europe (1998)

Describes the way the problem is attacked in a great number of European cities. The air-quality monitoring and management capability of 72 major urban agglomerations in 32 countries are assessed on a city-by-city basis. With recommendations as to how to improve air quality most efficiently.

EEA Monograph No. 5. 140 pp. 30 ecus. Published by the European Environment Agency. Available from the Office for Official Publications of the European Communities, L-2985 Luxembourg. Also from national outlets for EU publications.

### OECD Environmental Performance Review: Switzerland and Belgium (1998)

Reports scrutinizing efforts to meet both domestic objectives and international commitments evaluate progress in reducing the pollution burden, improving natural resource management, integrating environmental and economic policies, and strengthening international cooperation. The analyses are supported by a broad range of economic and environmental data.

Belgium: 224 pp. 180 francs. Switzerland: 226 pp. 180 francs (also available in German). Can be ordered from OECD, 2 rue André Pascal, 75775 Paris cedex 16, France. E-mail: order@oecd.org

### CO<sub>2</sub> Emissions from Fuel Combustion (1998)

Published by the International Energy Agency. A compilation of emission data from more than 140 countries for the period from 1971 to 1996. \$150.00. Obtainable from IEA Publications, P.O. Box 2722, London W1A 5BL, England. Fax. +44-171-896 2245.

### Risk Management under Uncertainty (1998)

By M. Johannesson. An investigation of the ways in which society handles and judges the risks in cases where there is great uncertainty, as for instance with regard to climate change. Available free of charge from Department of System Ecology, Library, Stockholm University, 106 91 Stockholm, Sweden.

### Integrated monitoring: Environmental Assessment through Model and Empirical Analysis (1998)

By M. Forsius et. al. Lists the methods that can be used to forecast the effects that various levels of depositions of acidifying substances will have on soil and ecosystems. Can be ordered from the Finnish Environment Institute, Box 140, 00251 Helsinki, Finland. E-mail: neuvonta@vyh.fi.

	Per cent of forest area where the critical loads were being exceeded in 1995 <sup>1</sup>	Country's total forest area <sup>2</sup>	Forest area where the critical loads for acidification are being exceeded	Extent to which each country is responsible for the critical loads being exceed in Europe's forests as a whole	
	%	1000 ha	1000 ha	1000 ha	%
Germany	67	10 740	7 196	6 852	24.0
Poland	43	8 942	3 845	3 369	11.8
France	22	15 156	3 334	2 918	10.2
Czech	95	2 630	2 499	2 066	7.2
UK	8	2 469	691	1 635	5.7
Italy	15	9 857	1 479	1 608	5.6
Russia	1	163 308	1 633	1 122	3.9
Hungary	66	1 811	1 195	946	3.3
Belarus	26	7 865	2 045	875	3.1
Ukraine	5	9 458	473	799	2.8
Netherlands	85	339	288	616	2.2
Belgium	17	646	110	507	1.8
Spain	1	12 788	128	485	1.7
Austria	27	3 840	1 037	438	1.5
Slovakia	31	2 016	625	389	1.4
Romania	0	6 301	0	250	0.9
Sweden	2	27 264	545	226	0.8
Denmark	2	445	9	222	0.8
Switzerland	9	1 173	106	181	0.6
Norway	9	8 710	784	168	0.6
Finland	2	21 720	434	155	0.5
Slovenia	0	1 099	0	127	0.4
Yugoslavia	0	2 000	0	118	0.4
Bulgaria	0	3 590	0	110	0.4
Lithuania	0	1 978	0	96	0.3
Bosnia	0	2 710	0	95	0.3
Ireland	9	591	53	93	0.3
Estonia	0	2 013	0	55	0.2
Croatia	0	1 775	0	48	0.2
Luxembourg	25	86	22	41	0.1
Moldova	7	324	23	32	0.1
Latvia	0	2 884	0	27	0.1
Greece	0	3 359	0	24	0.1
Portugal	0	3 383	0	22	0.1
FYR Macedonia	0	994	0	9	0.0
Albania	0	1 030	0	6	0.0
Iceland	0	30	0	1	0.0
Unidentified/ Sea transport				1 821	6.6
Sum		345 324	28 553	28 553	100.0

<sup>1</sup> Source: Coordination Center for Effects (of the Convention on Long Range Transboundary Air Pollution). <sup>2</sup> Source: TBFRA. Figures for Former Yugoslavian Republic Macedonia, Estonia and Bosnia-Herzegovina are from TBFRA-90, updated -95.

GROUND-LEVEL OZONE

# A worldwide problem

DISCUSSION WITHIN the EU and the Convention on Long Range Transboundary Air Pollution, as to what can be done to reduce the concentrations of ground-level ozone, has so far centred on two groups of pollutants: nitrogen oxides (NOx) and volatile organic compounds (VOCs).

Less notice has been given to the fact that this kind of ozone is also being formed on a global scale. Additional causes (besides NOx and VOCs) are carbon monoxide (CO) and methane. Modelling carried out in England at the Hadley Centre for Climate Research indicates a worldwide increase in the formation of ground-level ozone, despite expected reductions in the emissions of NOx and VOCs in Europe and North America. Consequently there will be an increase in the so-called

background concentrations, so that very extensive measures will be needed to curb the emissions of NOx, VOCs, and CO if the limit value for health recommended by the WHO is to be attained (that is, an 8-hour value of 60 ppb).

Still more difficult will be to get down below the critical limit for the exposure of vegetation to ozone (AOT40 less than 3000 ppbh). Measures taken in Europe will not suffice. According to the Hadley modelling, action for dealing with ozone precursors will have to be on global scale.

Further information can be obtained from R.G. Derwent, Hadley Centre for Climate Research, Met O, London Rd, Bracknell, Berks, RG12 2SZ, England.

USA

## Subdued optimism

ACCORDING TO the annual report of the Environment Protection Agency, published just before Christmas, the concentrations of air pollutants have markedly decreased in the US during the last ten years. There have been drops of 14 and 19 per cent, respectively, in nitrogen oxides and ozone, while the concentrations of sulphur dioxide have decreased by 39 per cent.

Nevertheless much remains to be done. In 1997 approximately 107 million Americans were living in areas

where the ambient air standards for at least one of the six major pollutants were not being met. The EPA also notes the following:

At the same time that air pollution had been decreasing significantly between 1970 and 1997, gross domestic product increased by 114 per cent, the US population increased 31 per cent, and the vehicle miles travelled by 127 per cent.

The report is available on internet:  
<http://www.epa.gov/oar/aqtrnd97/>.

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## Coming events

**Working Group on Strategies under the Convention on Long Range Transboundary Air Pollution.** Geneva, Switzerland. March 22-26, 1999.

**The Automotive Industry and the Environment.** Stuttgart, Germany. April 21-22, 1999. *Information:* Energy Logistics International Ltd, 70-72 St Marks Road, Maidenhead, Berks. SL6 6DW, England. E-mail: [enquiries@energylogistics.co.uk](mailto:enquiries@energylogistics.co.uk).

**Air Quality in Europe: Challenges for the 2000s.** Venice, Italy, May 19-21. *Information:* Dr. Vincenzo Cocheo, Fondazione Salvatore Maugeri-IRCCS, via Svizzera, 16, I-35127 Padova, Italy. Fax. +39 0498064555. E-mail: [fsmpd@tin.it](mailto:fsmpd@tin.it). Internet: [www.fsm.it](http://www.fsm.it).

**CHP and Biomass: Realizing the Potential.** Amsterdam, Netherlands, May 26, 1999. Workshop. *Information:* Cogen Europe, 98 rue Gulledele, 1200 Brussels, Belgium. Fax: +32 2772 5044; E-mail: [cogen\\_europe@csi.com](mailto:cogen_europe@csi.com).

**Working Group on Strategies under the Convention on Long Range Transboundary Air Pollution.** Geneva, Switzerland. May 31-June 4, 1999.

**Meetings of the Subsidiary Bodies to the UN Framework Convention on Climate Change.** Bonn, Germany. May 31-June 11, 1999. *Information:* Climate Secretariat, P.O. Box 26 01 24, 53153 Bonn, Germany. E-mail: [secretariat@unfccc.de](mailto:secretariat@unfccc.de). Web site: [www.unfccc.de](http://www.unfccc.de).

**Implementing the Kyoto Protocol.** London, England, June 14-15. *Information:* Royal Institute for International Affairs, Chatham House, 10 St. James's Square, London SW1Y 4LE, UK. Fax. +44 171 321 2045. E-mail: [mgray@riia.org](mailto:mgray@riia.org). Web site: [www.riia.org/Conferences/cond.html](http://www.riia.org/Conferences/cond.html).

**Third Ministerial Conference on Environment & Health.** London, England, June 16-18, 1999. Ministerial Conference organized by World Health Organization. *Information:* [www.who.dk/london99/](http://www.who.dk/london99/).

**Council of EU Environment Ministers.** Luxembourg, June 24-25, 1999.

**Air Pollution 99: The International Conference on Modeling, Monitoring, and Management of Air Pollution.** San Francisco, California, USA, July 27-29, 1999. *Information:* Air Pollution 99, Wessex Institute of Technology, Ashurst, Southampton, SO40 7AA, UK. Fax. +44 1703 292 853. E-mail: [wit@wessex.ac.uk](mailto:wit@wessex.ac.uk).