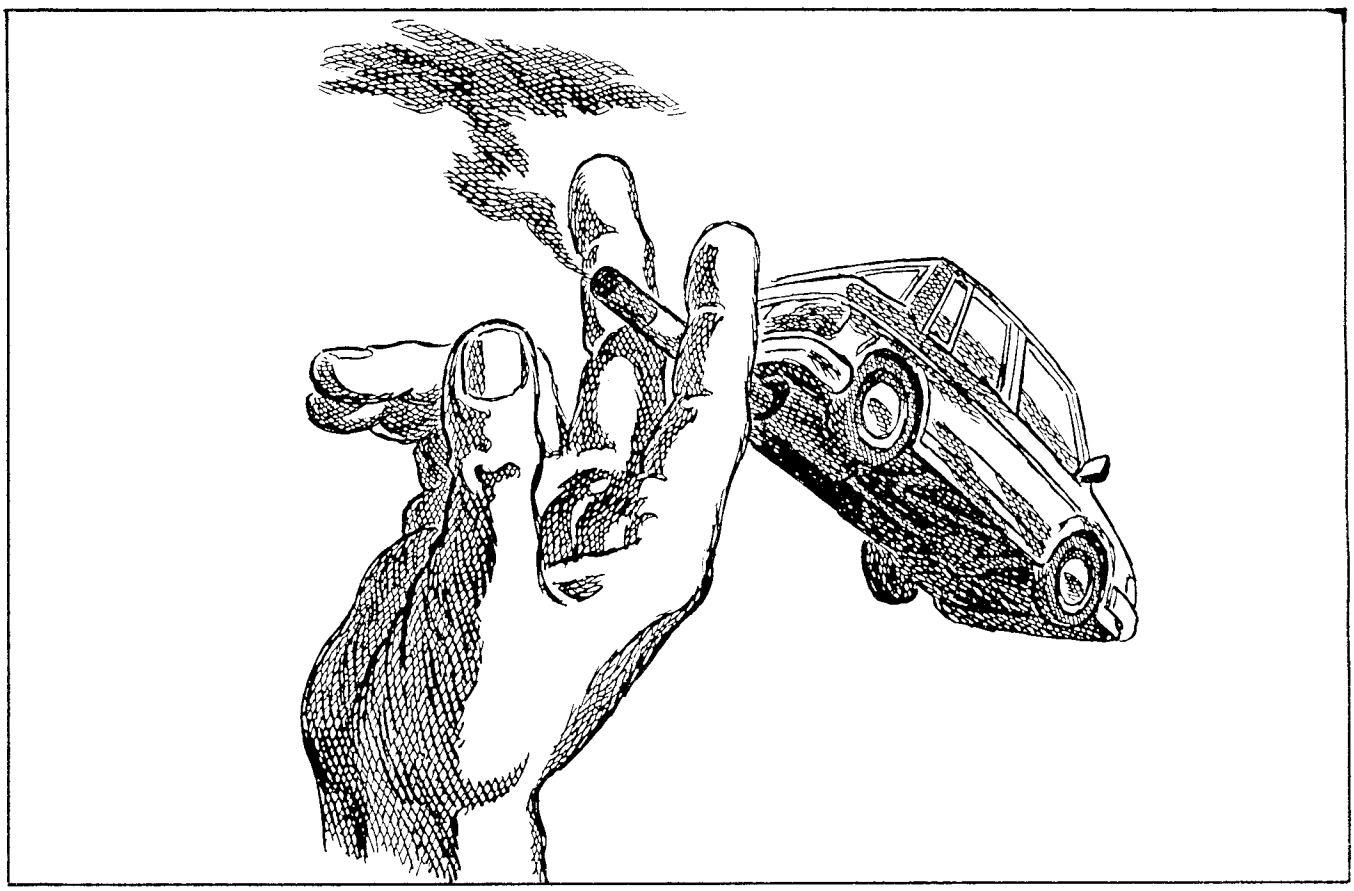
No 2, May 1988

Acid News

A Newsletter from the Swedish and Norwegian NGO Secretariats on Acid Rain



Drawing: Claus Albrechtsen ©

UN ECE

The NO_x debacle

Once again the Working Group of the UN Economic Commission for Europe has failed to agree on a protocol for reducing emissions of nitrogen oxides. At the last meeting of the group in February there was still disagreement both as to how much and when emissions should be reduced.

Non-governmental organizations such as the International Union for the Conservation of Nature and Natural Resources (IUCN), Friends of the Earth International, and Greenpeace International have usually been able to attend the meetings as observers, but this last time the NGO representatives were suddenly excluded from the proceedings during two of the four days of the meeting. Although no explanation was given, this happened just at the time when discussion of some compromise proposals was at its height. Evidently the delegates did not wish the environmentalists to witness the embarrassing bargaining over the two remaining compromises, heavily watered down as they were.

At the previous meeting in November last year West Germany, Sweden, Switzerland, the Netherlands, and Austria had proposed reducing nitrogen-oxide emissions by 30 per cent from the 1985 levels by 1995. Most of the other countries however did not like the idea. They wanted instead to freeze emissions at their mid-nineties level, and consider proposals for an eventual reduction later on.

Since they got no support, the countries that were proposing a 30-per-cent reduction have now given up. From the February meeting there emerged two further alternatives, both involving a freeze at 1987 levels. The one, which has the support of the

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Acid News

A newsletter from the Swedish and Norwegian NGO secretariats on acid rain.

ACID NEWS is a joint publication of the two secretariats, whose 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 secretariats at either of the addresses below. All requests for information or material will be dealt with to the best of our ability.

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:

The Swedish NGO Secretariat on Acid Rain

Miljövard
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S-411 16 GÖTEBORG, Sweden

Telephone: 031-13 12 97

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THE SECRETARIATS

The Swedish NGO Secretariat on Acid Rain is supported by the following environmental organizations:

- The Environmental Federation (Miljöförbundet)
- The Swedish Anglers' National Association (Sportfiskarna)
- The Swedish Society for the Conservation of Nature (Svenska Naturskyddsföreningen)
- The Swedish Youth Association for Environmental Studies and Conservation (Fältbiologerna)

Address and telephone: see above.

The Norwegian secretariat, **"The Stop Acid Rain Campaign/Norway,"** is organized by six non-governmental organizations concerned with the environment:

- Nature and Youth (Natur og Ungdom)
- The Norwegian Forestry Society (Det Norske Skogselskap)
- World Wildlife Fund/Norway (Verdens Villmarksfond)
- The Norwegian Association of Anglers and Hunters (Norges Jeger- og Fiskeforbund)
- The Norwegian Society for Conservation of Nature (Norges Naturvernforbund)
- The Norwegian Mountain Touring Association (Den Norske Turistforening)

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30-per-centers plus Denmark and Canada, calls for a freeze in 1990. As many as fourteen countries, including Britain, the United States, Italy, Spain, Norway, Finland, USSR, and others in the eastern bloc, propose on the other hand delaying the freeze until 1994.

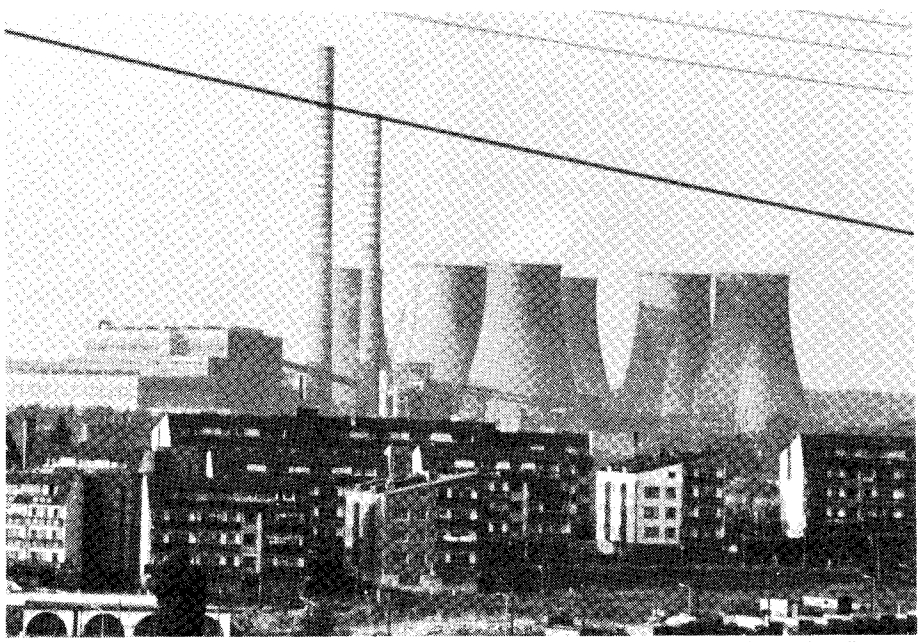
While disagreement now rests mainly on the timing, there are also some other matters leading to disunity. One is a demand from the United States that it should be allowed to take into account previous reductions, gained through the introduction of catalytic exhaust cleaning as early as the seventies. If this were allowed, it would mean that the US could increase its emissions of nitrogen oxides by 10-20 per cent. These emissions are now a good 18,000,000 tons a year, making the country the world's greatest emitter, reckoned per capita as well. Canada, which is the recipient of great quantities of pollutant from its neighbour, is one of the countries that are adamantly opposed to this American demand.

The Working Group inevitably faces a dilemma, since its directive requires it to produce a protocol that will both lead to effective reductions and be acceptable to a large number of countries. Apparently two irreconcilable requirements. The next step will therefore probably be to take up the matter on a ministerial level, in the hope of finally reaching an acceptable compromise.

Environmentalists can only note with dismay that the protocol is becoming ever more watered down as the negotiations proceed. The Working Group is evidently striving hard to arrive at a compromise solution that will have as wide a support as possible. The directive's requirement for an effective reduction of nitrogen-oxide emissions does not, on the other hand, appear likely to be met. Emissions will thus be allowed to go on increasing for several years to come, at the worst until well into the nineties. The results of such shortsightedness will inevitably make themselves known to all and sundry in the form of harm to humans, material structures, and ecosystems.

If we are to avoid harm, the emissions of nitrogen oxides will have to be reduced by at least 75 per cent, and quickly. Environmentalist organizations as well as private individuals should therefore act without delay, urging their governments to actively work for a protocol that will be worth the paper it is written on, and really bring about a reduction of emissions.

Christer Ågren



District heating plant, Glewice, Poland. *Photo: André Maslennikov ©*

POLAND

Towards betterment

A plan that could lead to a reduction of Poland's emissions of sulphur by 30 per cent between 1985 and 2000 has recently been put to the consideration of the Polish government. It has been developed by a special working group, known as the Sulphur Commission, that was appointed by the government in the autumn of 1986. Little more than a year later the commission produced its report, and the plan was described as follows by one of the members, Andrzej Jagusiewicz, at a Swedish-Polish seminar (see box) in Sweden last February.

As a first step the commission examined the main sources of emissions of sulphur dioxide and nitrogen oxides, evaluated the extent of air pollution due to acid substances, and their effect on the environment, and assessed the possibilities of reducing their release to the atmosphere.

The present emissions of sulphur dioxide from the various sources in Poland, with projections to 1995, are shown in Table 1. As may be seen from the table, more than 90 per cent of the sulphur emissions emanate from the production of energy, and 97 per cent of the total SO_2 emissions from such sources come from the production of electrical energy and heat. Only 3 per cent is due to kinetic energy generation. Almost 100 per cent of the energy supply is obtained through the burning of fossil fuels, mainly domestic hard and brown coals. In 1985 160.6 million tons of hard coal and 56.5 million tons of brown coal were burned to produce energy. All coals are burned in their natural state, and no control technology has so far been applied on an industrial scale. Thus almost all the SO_2 generated in the burner is emitted to the atmosphere. The use of domestic hard and brown coals for producing energy is expected to continue increasing until the year 2000. So will the emissions of SO_2 according to a laissez-faire scenario. No substantial input from nuclear energy is foreseen until sometime in the next century.

As appears from Table 2, 50 per cent of the nitrogen-oxide emissions emanate from stationary energy sources, slightly more than 25 per cent from industrial processes, and just under 25 per cent from transportation. Predominant among industrial processes are high-temperature technologies associated with the combustion of coke, oil and gas. Only the transportation share is forecast to have increased by 1995, the others remaining stagnant or decreasing.

The plan. As the next step, taking into account industry's ability to cope with the problems, the commission formulated a Program for the Reduction of Airborne Sulphur and Nitrogen Compounds up to the Year 2000. This is mostly based on control technology, and it is expected to be put into force by government decision this fall. If carried out consistently, it will reduce emissions of SO_2 in 1995 by 1,775,000 tons and those of NO_x by 380,000 tons. By the year 2000 the reductions should amount to 3,600,000 tons for

Table 1. Polish emissions of SO_2, present and projected.

Sources	1985 Emissions of SO_2		1995 Emissions of SO_2	
	10^3 tons/y	%	10^3 tons/y	%
Power plants	1,940	45.2	2,450	48.1
Industrial energy and heat	880	20.4	1,000	19.6
Manufacturing processes	400	9.3	450	8.8
Domestic and agriculture	980	22.8	1,100	21.5
Transportation	100	2.3	100	2.0
Total	4,300	100.0	5,100	100.0

Table 2. Polish emissions of NO_x, present and projected.

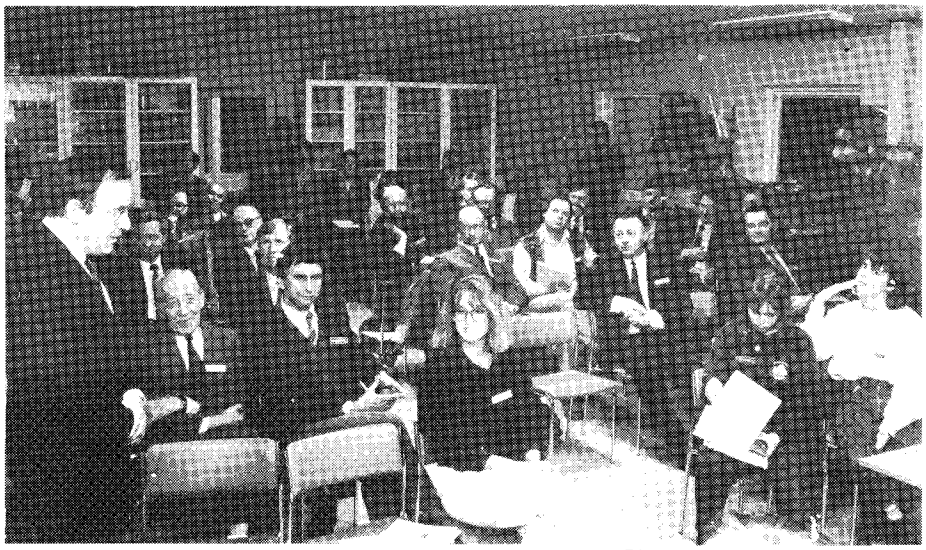
Sources	1985 Emissions of NO_x		1995 Emissions of NO_x	
	10^3 tons/y	%	10^3 tons/y	%
Power plants	400	26.7	500	25.0
Industrial energy and heat	240	16.0	300	15.0
Manufacturing processes	400	26.7	500	25.0
Domestic and agriculture	110	7.3	150	7.5
Transportation	350	23.3	550	27.5
Total	1,500	100.0	2,000	100.0

SO_2, and for NO_x almost 900,000 tons.

Coal desulphurization. The program involves the desulphurization of coals with a high and medium sulphur content to the amount of 9.15 and 44 million tons respectively by 1995. Subsequently an additional 60 million tons of medium-sulphur coal will be processed, so that the total quantity of desulphurized coal of this type will reach 104 million tons by the year 2000. The total reduction effect will be of 750,000 tons of SO_2 by 1995 and of 1,350,000 tons by 2000. (S-removal rate is between 20 and 40 per cent.) Simultaneously a number of small fluidized beds should be designed and put into operation in order to utilize waste from the desulphurization processes for medium-sulphur coal. On the other hand waste generated during the desulphurization of coals with a higher sulphur content could be directly used as raw material for sulphuric acid.

Combustion technology. It is proposed to gradually retrofit the existing combustion plants with low-temperature-design fireboxes and special low-NO_x burners. The use of such alternative technology will make it possible to reduce NO_x emissions by 185,000 by 1995 and 285,000 tons by the year 2000. After 1995 the fluidized beds for grate combustion that will then be available will have further reduced SO_2 emissions by 75,000 tons and NO_x emissions by an additional 30,000 tons in the year 2000.

Flue-gas desulphurization. Also envisaged for SO_2 is the installation of FGD systems, based on the wet-lime method, in power plants with a total electrical capacity of 1200 MW by 1995, and 3600 MW by the year 2000. The removal rate for SO_2 is about 80 per cent, so the total reduction effect will be respectively 100,000 tons and 300,000 tons. At the same time industrial combustion plants will be equipped with smaller FGD systems, using both the wet-lime and semi-dry methods, thus causing an additional 200,000 and



Poland's Ambassador to Sweden speaking at the seminar. Photo: André Maslennikov ©

Getting together

It seems that collaboration between Sweden and Poland will be essential if the latter's emissions of pollutants are to be curbed within any reasonable time. It is also a matter of urgency, since health as well as the environment are at stake in both countries. With this in view the Swedish-Polish Association for Environment Protection last February convened a seminar to air the problems together with delegates from Poland. At this seminar, which was held out in the countryside not far from Stockholm, some twenty papers were read by Polish authorities and their Swedish counterparts.

Besides the reports of scientists and engineers, views were presented by central and local government officers and representatives from Polish industry, the Catholic church in Poland, environmental organizations, and the Polish communist party. The situation as regards the environment in Poland thus came to be illustrated from a variety of aspects, and proposals for dealing with the problems were also presented.

Speakers on the Swedish side told amongst other things of the government's attitude to cooperation with Poland as a part of environmental policy, the effects of air pollution in Sweden, with allusion to the critical-load concept, and the possibilities of reducing emissions by a more efficient use of energy. Swedish manufacturers of equipment for controlling emissions were also able to present their systems.

During the discussions with which the seminar ended the need was brought out of an increased exchange of information between the two countries, as well as the desirability of personal contacts on all levels.

It was agreed that technical exchanges should concern in the first place so-called environmentally friendly technology — meaning in particular advanced combustion techniques, flue-gas desulphurization, and methods for using energy efficiently as well as alternative energy sources. The financial aspects were also ventilated — the possibility being put forward, for instance, of Poland paying for Swedish technology with coal. Another idea was to tap aid through a European fund.

This seminar may be regarded as having been an attempt to lay a broad foundation for collaboration between the two countries for the purpose of saving the environment, and it appears to have been highly successful. The attendance of representative personalities on both sides, as well as the determination to achieve results that it revealed, both auger well.

Christer Ågren

Later this summer a full report of the proceedings will be published in English. Copies may be obtained from the Swedish-Polish Association for Environment Protection, c/o Zofia Kukulska, SNV, S-170 11 Drottningholm, Sweden.

430,000 tons of SO_2 to be removed by 1995 and 2000 respectively.

Lime injection. The sulphur dioxide emissions of boilers fired with brown coal can be most effectively reduced by the dry-lime method, which consists in injecting lime over the burning fuel. Such FGD systems are to be installed by 1995 in power plants with a total electrical capacity of 3000 MW, and by the year 2000 additional units with a capacity amounting 3600 MW generated from brown coal will be so equipped. The reduction effect for SO_2 will be 120,000 tons by 1995 and 260,000 tons by 2000.

Other measures that are proposed to be undertaken as part of the program include

- ☐ The application of low-waste technology in the chemical and metal industries.
- ☐ A more rational use of energy and heat in all sectors.
- ☐ The production of diesel fuel with a lower sulphur content.
- ☐ Equipping petrol-driven cars with catalyzers.

If implemented these measures will bring the total reduction of emissions of SO_2 to 1,775,000 tons in 1995 and 3,630,000 tons in 2000, and the total reduction of NO_x to 380,000 tons in 1995 and 895,000 tons in 2000.

International cooperation. According to Mr Jagusiewicz the most important international forum for bringing about further reductions of acid pollutants will continue to be the Economic Commission for Europe (ECE) with its relevant regional agreements. Poland will also be developing bilateral agreements for attainment of common regional objectives with neighbouring countries more quickly, as well as with market-economy countries. Bilateral agreements are thought to provide good opportunities for joint ventures, which may in turn facilitate the exchange of technology for reducing emissions. Respect of the rules for facilitating exchanges of technology as set forth in Decision 14/16 of the UNEP Governing Council could have a very positive effect on the pace of implementation for the Polish program for reducing emissions both of sulphur dioxide and nitrogen oxides.

Near the Nowa Huta works.
Photo: André Maslennikov ©

Costs. The cost of all the measures for SO_2 abatement that are proposed in the program will amount to about 500 billion zloty (in pre-February 1988 prices). This will be twenty-five times more than all expenditure on air protection investment in 1986. In 2000 the projected "laissez-faire" emissions of SO_2 would be about 6,000,000 tons, so if the plans were to be fully implemented it would reduce emissions to a level of 2.4—2.5 million tons, thus achieving the first strategic goal. The same applies for the second, as NO_x emissions would be reduced by about 1.5—1.6 million tons by the end of the century. The total cost of the latter is however impossible to estimate at the moment, since there is no experience on a semi-industrial scale of the measures proposed in the program for reducing NO_x emissions.

It may be noted that Poland already has ambient-air quality standards both for sulphur dioxide and nitrogen oxides. These put the maximum yearly average for sulphur dioxide at 64 $\mu g/m^3$ today, to be halved to 32 $\mu g/m^3$ from 1991. The requirements are moreover much strict-

Taking up cooperation

The Swedish-Polish Association for Environment Protection (Svensk-Polska Miljöföreningen SPM) was founded during January last year in Stockholm with the aim of stimulating cooperation between organizations, enterprises, authorities, and individuals in Sweden and Poland interested in the protection of the environment. SPM is concerned with direct measures for counteracting the destruction of the environment, and is endeavouring to create a greater interest in the environment in both countries.

In 1987 the SPM and the Swedish Environmental Federation started a special action to raise money so that gas can be used instead of coal for heating forty buildings in old Cracow.

The SPM has also suggested that Swedish towns should engage in direct cooperation with towns in Poland for the protection of the environment. The idea was met with great interest in some ten Swedish towns, including Gothenburg.

During its first year the SPM developed contacts not only with environmental organizations in Poland, such as the Polish Ecological Club and the League for the Protection of the Environment, but also with central and local authorities, the Catholic Church, industries, research institutes, and universities, and representatives from these sectors of Polish society were invited to the seminar arranged by SPM last February.

There has been a great increase of interest in the ecological situation in Poland during the last year, as shown for instance by the number of articles in the Swedish press. It will be a challenge for SPM to keep this interest alive and also to encourage other European countries to take up cooperation with Poland.

Svensk-Polska Miljöföreningen
Szwedzko-Polskie Towarzystwo Ochrony Srodowiska
The Swedish-Polish Association for Environment Protection
Address: c/o Zofia Kukulska, SNV, S-170 11 Drottningholm, Sweden.

er for areas designated as specially protected, such as Cracow, where the official maximum is 11 $\mu g/m^3$. Even the present standards are however exceeded in many parts of the country. In Cracow for instance the annual average for sulphur dioxide is almost 100 $\mu g/m^3$.

Charges and fines. At the seminar Andrzej Jagusiewicz also mentioned proposals for further measures that might serve as a complement to those described above. As examples he gave quality standards for fuel, as well as emission standards. Financial incentives were also a possibility, including subsidies for capital investments to curb emissions. Environmental charges and fines could be used more effectively too.

Until quite recently the emission charge for 1 ton of sulphur dioxide emitted averaged 2,400 zloty. On the other hand, as he pointed out, the related ecological damage has been estimated to be about 100,000 zloty. Since the beginning of 1988 charges on emissions to the atmosphere have been raised on an average three-fold. But comparison with the ecological damage (without taking into account the inflation rate after February 1) shows clearly the necessity for a much greater increase of the unit charge. In 1986, for example, all the emission charges amounted to only 0.7 per cent of the total market value for all manufactured products and services.

Fines are imposed if the emission levels laid down in operating permits are exceeded by the polluter. On an average they are three times higher than the emission charges and have some effect on the producer's profits. However they are no more effective than emission charges, because in 1986 they reduced the profit from all economic activity by a mere 0.5 per cent.

Envisaged reductions. The strategy that has thus been put forward by Jagusiewicz and others at the Institute for Environment Protection in Warsaw, for controlling atmospheric pollution in Poland, may be summarized as:

1. Aiming to decrease SO_2 emissions by 30 per cent by 2000, compared with 1985, and then further reducing such emissions so as to match new air-quality standards by 2010 at the latest, and
2. To stabilize the emissions of nitrogen oxides after 1995 at the 1985 level.

Cracow: buildings disintegrating. Photo: André Maslennikov ©

Achievement of the first will mean reducing SO_2 emissions in 2000 to less than 3 million tons and a further reduction by 2010, to no more than 2 million tons. A basic difficulty is that the second stage involves a two-fold decrease of the annual discharges of SO_2 to the atmosphere starting in 1991, which means a redoubling of the reduction effort too. On the other hand, for achieving the second goal, alternative combustion technology seems the ultimate soultion. All measures aimed at direct reduction of the emissions of SO_2 and NO_x would have to be supported by a national energy conservation program, implemented in parallel. The commission notes moreover that renewable energy sources such as biogas, wind, and water should play an increasing role in future for a national energy balance.

It is now incumbent on the rest of us to do all we can to help ensure realization of the commission's proposals with the least possible delay. However inadequate they may be in consideration of the reductions that will be needed in order to get below the critical-load levels (see Acid News 3-4/86), they may at least constitute a first step towards a more ambitious program later on.

Christer Ågren

Fund for cleaner air

The Nature Protection League is a Public Service Institution which is oldest and has the largest membership (1.6 million) of all the organizations in Poland concerned with the protection of the natural environment, having been established as early as 1928. It concerns itself with educative and attitude-shaping activities, promoting knowledge of the natural habitat and sponsoring numerous drives for ecological protection.

On account of the increasing air pollution and the consequent danger to Poland's forests, last year the League formed the

Public Air Protection Fund.

The aim of the fund is to build up financial resources for use in promoting creative initiatives in the field of air protection, contributing to the costs of the practical application of inventions and improvements in protective installations as well as publicizing achievements in these respects.

Contributions to the fund are equally acceptable from individuals, institutions, enterprises, and public organizations, both in Poland and abroad. The address and account number of the fund is:

Liga Ochrony Przyrody
ul. Reja 3/5
02-053 Warsaw, Poland
Account number: NBP Glowny Oddz. Warsaw 11-544067-151-6787-donation.

The fund is administered by the National Committee for the Public Air Protection Fund, appointed by the Central Board of the Nature Protection League.

Making a start

In Sweden the Environmental Federation and the Swedish-Polish Association for Environment Protection have started to raise money to enable forty central-heating furnaces in the old part of Cracow, a city of half a million in southern Poland, to be converted to natural gas — and thus help to reduce the pollution from burning coal.

Cracow is one of the four places that have been designated as ecological emergency areas. Whereas the average rate of deposition of sulphur in Poland is 14 tons per square kilometre, in Cracow it amounts to 255 tons. Because the town lies in a depression, the pollutants accumulate, with extremely high concentrations in the atmosphere as a result. This means shortened lives and worsened health for the people of Cracow.

One quarter of the inhabitants of the central parts of the city suffer from high blood pressure, and 15.7 per cent of the men there have chronic respiratory complaints. Moreover some forms of cancer, such as lung cancer and breast cancer, are twice as frequent in central Cracow as elsewhere.

The tremendous amounts of fuel that are burnt, mostly coal, can in extreme circumstances cause the oxygen content of the air to be 2 per cent lower than normal. People then suffer from an insufficiency of oxygen (the air we exhale contains 4 per cent less oxygen than that we inhale). The body attempts to compensate for this by a faster rate of pulse and breathing.

Worst affected are children and weak and sick persons. At times in 1985 the concentrations of sulphur dioxide in the Cracow air amounted to 1000 micrograms per cubic metre. With lengthy exposure even 100 micrograms can cause respiratory diseases in children, and concentrations of more than 500 micrograms lead to increased mortality among the old and chronically ill.

The very pollutants that affect people's health are also destroying a most valuable part of our cultural heritage. Cracow, which was the capital of Poland from 965 to 1609, is full of historically significant buildings. The old city core, which miraculously survived bombing during the second world war, has been classified by UNESCO as a cultural reserve of highest importance for the world at large. But the high concentrations of pollutants in the air are causing its unique buildings to disintegrate a thousand times more rapidly than they would do normally. With the resources at disposal, the authorities can save only a fraction of the total.

The changeover to gas instead of coal for heating dwellings is in progress, but all too slowly. In the meantime people's health suffers, and so do Cracow's historic monuments and buildings.

Reverse the trend!

This cannot be allowed to go on. It needs to be shown that the trend can be reversed. After consultation with the editor of Aura, the Polish environmental publication, the two Swedish organizations decided to start a money-raising campaign to help clean the air in Cracow.

The air pollution in Cracow is in great part due to the use of coal for heating dwellings. If it was done entirely with natural gas, the pollution would be halved. While there are pipelines for gas in Cracow, the automatic control equipment that would enable natural gas to be used is lacking. The immediate aim of the fund for cleaner air in Cracow will therefore be to provide the means for installing such equipment in forty of the city's apartment houses.

Make your contribution today! You can do so by cheque payable to Miljöförbundet, Account No. 83 03-3, and addressed to Postal Giro Sweden, International, S-105 06 Stockholm, Sweden, or by transfer direct to the account.

Mikael Johannesson
The Environmental Federation
Miljöförbundet

Recently published

Acid Rain: Scientific and Technical Advances (1987)
Scientific presentations made at the Acid Rain Conference held in Lisbon, September 1-3, 1987, addressing both the physical and biological aspects of the problem as well as the economics and control strategies. Edited by Perry et al. 821 pp. Published by Selper Ltd, Publications Division, 33 Westville Grange, Westbury Road, Ealing, London, England W5 2LJ.

Cause for Concern (1987)
The report, written by Nigel Dudley (ERR), presents an examination of the role of air pollution in the decline of various plant and animal species in Britain. Obtainable from Friends of the Earth Ltd, 26-28 Underwood Street, London, England N1 J3O. Price 5 pounds.

Wheels within Wheels — A study of the road lobby (1987)
By Mick Hamer. Foreword by Jonathon Porritt, Friends of the Earth. 162 pp. The road lobby is the most powerful political lobby in Britain today. It is immensely rich and is backed by some of the biggest businesses in Britain. Its aim is to control the country's transport policy.

Wheels within Wheels lays bare the road lobby.

☐ It reveals the politics behind the longstanding, and continuing, campaigns for heavier lorries and more motorways.

☐ It shows how the road lobby and its immensely powerful allies in the Ministry of Transport have systematically watered down important road safety measures, although 15 people are killed every day by motor vehicles.

☐ It discloses how the road lobby has contributed to the decline of bus and train services in Britain.

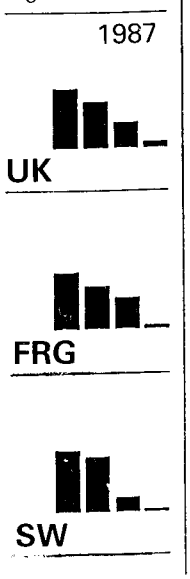
5.95 pounds. Published by Routledge and Kegan Paul, 11 New Fetter Lane, London, England EC4P 4EE.

Britain's woodlands

In a worse state than they cared to admit

Forest damage New Forest, South England.
Photo: Christer Ågren ©

Figure 1



Forestry Commission data show that British conifers are as badly hit by acid rain as those on the continent, and that Britain's oak trees are the most damaged in western Europe. This is what appears from a Greenpeace report comparing 1987 Forestry Commission data with forest surveys carried out on the continent. The report, When the Bough Breaks, reveals that

- ☐ Oak trees in the UK show over 40-per-cent damage, more than in any other western European country.
- ☐ Beech trees in the UK are the least healthy in Europe, according to the Forestry Commission's own survey.
- ☐ British conifer trees are as widely and severely damaged by acid rain as those on the continent of Europe.

When the Bough Breaks sets up-to-date UK forestry data for the first time against forest surveys carried out in West Germany, the Netherlands and Switzerland — the three western European countries most afflicted by forest damage — and shows the extent and character of forest decline in Britain to be almost exactly the same as in those countries. For some species, notably the English oak, the British decline is worse.

The report reaches some alarming conclusions. The bar charts (Fig. 1) show for instance damage profiles from all conifers surveyed in the UK, West Germany, and also Switzerland.

Figure 2

Changes in percentage of coniferous trees in moderate/severe categories (Class 2,3,4: 26-100 % defoliation), in four countries 1983—1987. Averages (i.e. all conifers surveyed).

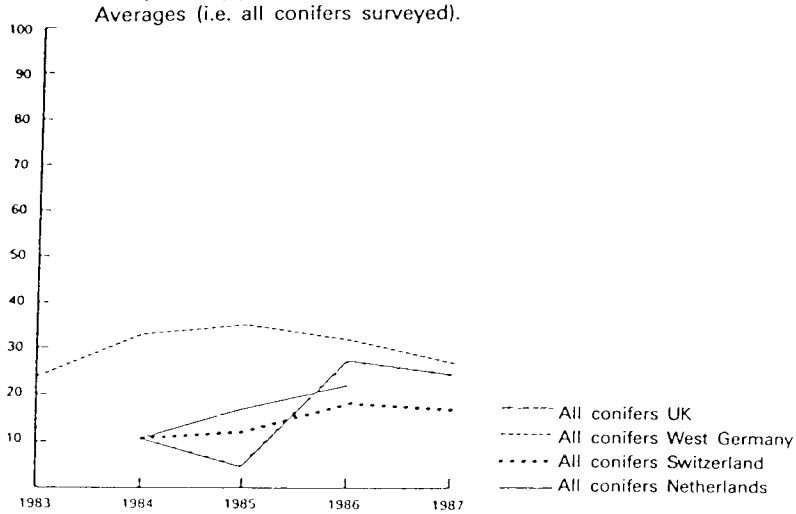
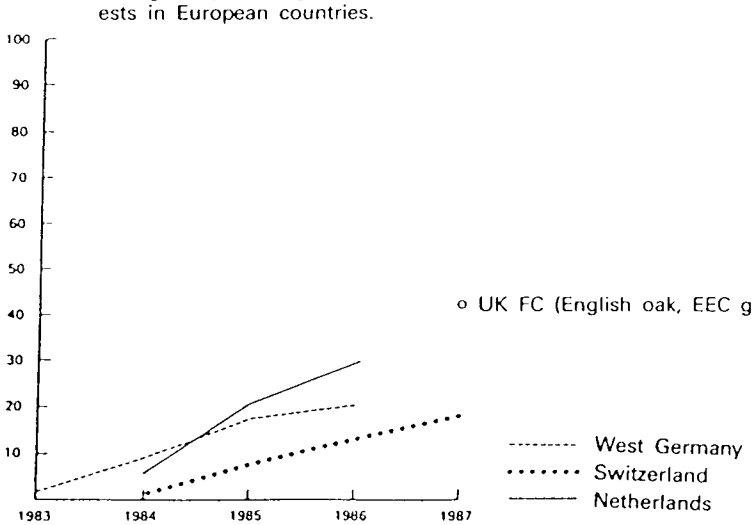


Figure 3

Change in percentages of moderately and severely damaged oak forests in European countries.



From left to right, the bars represent declining tree health, from "healthy" through "warning stage" and "moderate health" to the final stage, "dying or dead." The UK and West German profiles are almost identical.

Conifer decline for the four worst affected European countries is also charted (Fig. 2). The UK decline is second only to West Germany's, and the 1987 Forestry Commission figures for English oak are even worse (Fig. 3) than Germany's.

When the Bough Breaks also provides a scathing analysis of the Forestry Commission announcements on acid-rain damage, showing that the commission

☐ Issued reassurances about the health of British forests before a forest survey had even been carried out.

☐ Later issued similar reassurances on the basis of surveys which subsequently turned out to be incomplete and inadequately organized.

☐ Allowed its representatives to make statements about UK forest health which directly contradicted data produced by its scientists.

☐ Took four years to establish a survey procedure that actually worked, and then was so overwhelmed by what it found that it could not know how to interpret the data.

"This is a devastating report," says Steve Elsworth for Greenpeace. *"For the first time it documents the identical nature of the forest damage in the UK and in Europe. It also takes the lid off Forestry Commission duplicity and incompetence.*

"Acid rain is so low on the government's political agenda that it has fallen off the table," says Elsworth. *"No-one in the Cabinet shows a real interest in environmental protection, and the Department of the Environment is too busy with poll tax and local government to seriously look at what's happening to our countryside. Meanwhile, our forests are dying."*

The full report can be ordered from Greenpeace UK, 30-31 Islington Green, London, England N1 8XE.

Destruction not inevitable

The catastrophe facing Britain's forests as a result of damage from acid rain could be largely averted if only 40 per cent of the extra revenue from the forthcoming rise in the price of electricity were to be used to clean up the country's power stations, according to a report issued in March by Greenpeace.

The report entitled Energy for Life? was commissioned by Greenpeace from the independent research organization, Earth Resources Research. It concludes that sulphur dioxide emissions could be halved by 1996 through the injection of 1.7 billion pounds which is 40 per cent of the funds that will be generated by the price rise. In 1986 the UK emissions of sulphur dioxide rose by 200,000 tons to 3,740,000 tons — roughly one-sixth of the western European total.

"In the October hurricane we lost 15 million trees overnight. Imagine if the hurricane had lasted a whole month, and we'd lost 450 million trees. That's a fair estimate of the number of trees we're losing. Acid rain is the most likely cause of the current destruction of our forests. Unless the government cleans up our power stations, the situation is unlikely to improve," says Steve Elsworth, Greenpeace Acid Rain Campaigner.

The UK currently has the same level of tree damage as West Germany, where the state of the forests is considered a national catastrophe. The injection of 1.7 billion pounds, when added to the 650 million the Central Electricity Generating Board is spending on cleaning up three of Britain's power stations, amounts only to a fraction of the sum being spent in Germany to clean up theirs. Unless government policy changes, sulphur emissions in Britain will rise by 10 per cent by 1993, then fall back to present levels by 1998, following the clean-up of the three power stations.

"For years the government has refused to put up electricity prices by even 1 per cent to protect the environment, saying British industry could not stand such a price rise. Political priority in the run-up to privatization now dictates a rise of 14 per cent over two years," notes Elsworth. (In a recent survey 84 per cent of those polled in the UK were prepared to pay a 5—10 per cent increase in their electricity bills in order to combat acid rain damage.)

References
1. Fifteen million trees lost in the hurricane. *Forestry Commission estimate.*
2. 450 million trees being lost. *Calculation based on Forestry Commission data.*
3. UK and FRG tree damage levels the same. *Forestry Commission and FRG Forest Survey figures.* (Greenpeace Air Pollution report, No. 1).
4. FRG—UK clean-up programs. FRG spending 9.85 billion pounds. *(Financial Times).*

The problem of acidification looms

A lot is heard about acidification in Europe, but less about it in other parts of the world. Industrialization is however steadily spreading, and with it the threat of acidification, if not actual acidification, in other areas too.

During the last three years scientists from five tropical countries, headed by Henning Rodhe of the meteorological department at Stockholm University, have been examining the situation, taking note of emissions of pollutants, the pH of the precipitation, and the soil's sensitivity to acidification.

According to Professor Rodhe, the situation is neither alarming nor reassuring. Tropical countries, with the possible exception of China, do not have the same problem of acidification, he notes, as we have in Europe — although industrialization is now creating the conditions for greater acidification in these countries as well.

In Asia the emissions of sulphur and nitrogen pollutants are already considerable (see box). In China much comes from the burning of coal with sulphur contents up to 5 per cent. Such low-sulphur coal as the country has is often exported, so that acidification occurs on a scale comparable to that in Europe and North America. An area about the size of Sweden, comprising two whole provinces, Kweichow and Szechwan, is definitely acidified, and others may be too.

Large amounts of sulphur are also emitted in the northeastern part of the country, but on account of the lime-containing dust that is stirred up by the winds there, the pH of the precipitation is over 5. In other words, the rain is not acid. Considerable areas of China will thus be resistent to acidification, and this also seems to be the case in parts of India and Bangladesh, where very high pH values have been found even in industrialized areas.

Sulphur and nitrogen emissions were especially carefully surveyed in Venezuela, where they have increased markedly during the last fifteen years, and are expected to do so still more when some of the oil is used to produce energy for pumping up oil. Since the trade winds blow steadily in one direction, the pollution does not become dispersed as in Europe. Also the soils, which are naturally sour, will not be able to withstand any much greater deposition of acid.

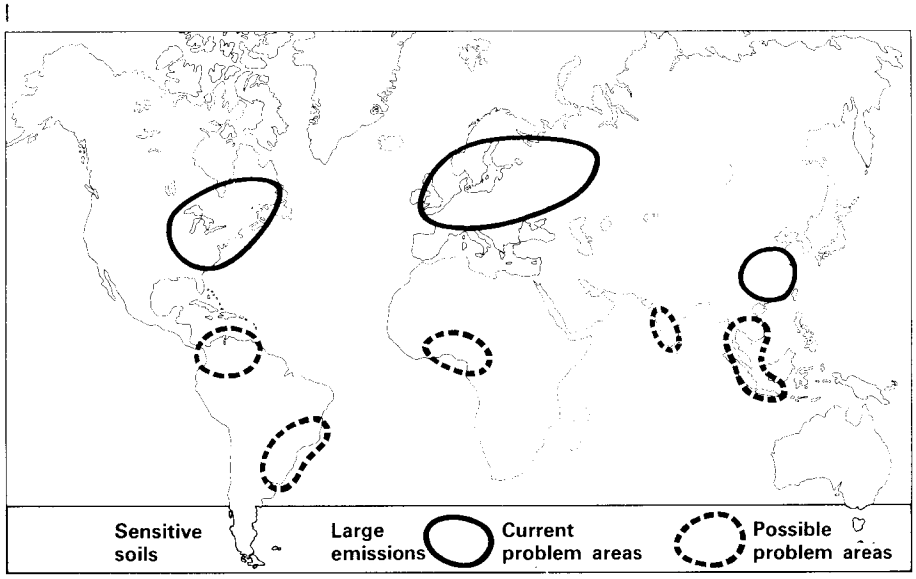
The tropical environment, says Professor Rodhe, seems in general to be naturally acidic, which must be borne in mind when trying to determine the effects of emissions. While acidic does not necessarily mean acidified, it does not mean either that naturally sour areas will not be sensitive to depositions of sulphur.

Sao Paulo in Brazil, with its surroundings, is one of the most polluted areas of the tropics. The content of sulphur dioxide and particulates in the air is extremely high, and it is quite possible that pollution is also being carried far out into the countryside.

Very low pH values were found in the northeastern corner of Australia, despite the very small amounts of man-made emissions. The recorded values in rainwater were often as low as 3.5. This is a natural phenomenon, the acidic substances coming from the vegetation in those parts.

In Nigeria, too, the industrial emissions of sulphur and nitrogen are still quite low, the domestic burning of wood being responsible for much of the output. But here there are soils in the coastal zone that are sensitive to acidification.

By forming ozone, the burning of vegetable matter such as straw as well as burning to clear the ground, is creating another large-scale environmental problem in the tropics. The problem is even more serious there than it is in Europe and North America. Burning gives rise to various nitrogen compounds, including nitrogen oxides. Hydrocarbons from the forests are already plentiful in the air, and in combination with the very strong sunlight, the outcome is greatly increased levels of ozone over extensive areas, as for instance in Brazil. Similar clouds of ozone are probably also formed over Africa. The high concentrations can be injuri-



Parts of the tropics where there, or may be, problems of acidification, according to recent research by SCOPE, the Scientific Committee on Problems of the Environment.

Drawing: Hans Nilsson ©

OZONE

Fears increasing

The ozone layer is thinning in the northern as well as the southern hemisphere, according to a new and exhaustive analysis of data made by an international panel of atmospheric scientists in March 1988.

The layer is thinning most in winter and at high latitudes, bringing fears that the same processes that have created an ozone "hole" over Antarctica in the past decade may also be at work over the Arctic.

According to Bob Watson from NASA, who chairs the ozone trends panel, man-made chlorine gases, especially CFCs (chlorofluorocarbons), are primarily responsible for the trends in the northern hemisphere.

He reported new fears about the development of the now notorious ozone hole over Antarctica. This year, it lasted longer than ever before, persisting from August into early December before disappearing as the "polar vortex" of air over the continent dispersed.

Besides being a potential cause of damage to fisheries and crops, the ultraviolet light admitted as a result of damage to the ozone layer above heavily populated countries will increase the already rising incidence of skin cancers.

Among white-skinned people, a 1-per-cent rise in received ultraviolet radiation will produce a 4-per-cent increase in non-melanoma skin cancers. A 1-per-cent decrease in ozone levels will produce a 2-per-cent rise in ultraviolet radiation. Luckily, however, the extent of ozone depletion is least in summer, when humans are at greatest risk from ultraviolet radiation.

One certainty, however, is that in the 1990s the ozone layer will become thinner. In 1970, said Watson, chlorine concentrations in the atmosphere were around 1.5 parts per billion. Today, they are 3 ppb and by the end of the century, before last autumn's Montreal convention to reduce the production of CFCs will have any effect, levels will rise to 5 ppb or more. *"To get back to 1.5 ppb we shall have to cut production of CFCs by 95 per cent. Even then we should be stuck with the ozone hole over Antarctica for at least 50 years."*

The conclusions of the ozone trends panel were criticized last week by Donald Heath from NASA's Goddard Space Flight Center. Using his own interpretation of the data, he suggested that the depletion of the ozone layer was more serious than the panel concluded.

New Scientist, March 24, 1988

►ous to health as well as to vegetation.

Professor Rodhe considers it highly important to start long-term studies of acidification the world over. We need to know, he says, how sensitive the various ecosystems are to acid substances, and as experience has shown, long series of measurements are required in order to be able to see the changes that are taking place. This applies not only to the spread of sulphur and nitrogen, but also of metals and poisonous chemicals.

The project that Professor Rodhe headed was carried out by the Scientific Committee on Problems of the Environment, an independent organization of scientists. The participating countries were China, Australia, Nigeria, Venezuela, and Brazil. Initially India and Bangladesh were also included, but later dropped out.

Anna Bonta-Anger

Emissions of sulphur and nitrogen compounds (millions of tons per year)

Europe	35	8
North America	19	7
Asia	18	5
South America	4	0.8
Africa	2	0.5
Australia	1	0.3

International Acid Rain Week 1988

May 28 — May 29

Days of action against **Transboundary Air Pollution,** highlighting:

☐ The emission contributions of each country to transboundary air pollution.

☐ Effects on forests and surface water.

☐ The reductions required of each country to achieve deposition and concentration values under the critical loads.

Proposed actions: Forest alerts in city parks. Balloon releases. Public debates.

May 30 — June 3

Days of action against the **Great Acidifiers in Europe,** with demonstrations, delivering of protests to embassies and consulates and international governmental agencies.

Days of action for **International Solidarity** among the environmental movements in eastern and western Europe. Fund raising and collections for strengthening the environmental work and connections between East and West, such as by organizing music or film evenings.

June 4 — June 5

Days of action against the **pollution from road traffic,** with special emphasis on the effects on human health; for instance with

☐ Bicycle demonstrations (wearing gas-masks, etc.)

☐ Announce car-free day June 5, World Environmental Day

☐ Seminars on health-effects.

HEALTH

Swiss clean air standards exemplary

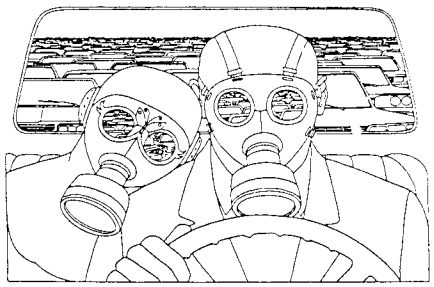
Research is more and more revealing a connection between air pollution and diseases such as cancer, bronchitis, and pseudo-croup. This makes it all the more important to tighten up air quality standards everywhere. Environmentalist groups would do well, for instance, to study their own countries' regulations and compare them with the relatively strict Swiss ones.

In December 1985 the Swiss Bundesrat issued a clean-air regulation (or Luftreinhalte-Verordnung, LRV) which on account of its strict immission standards should be a model for Europe. It sets down, besides the permitted limits for emissions, the highest permissible values for air pollution (immission limits), and the procedures to be followed when immission levels become excessive. Such levels are to be considered excessive when one or more of the immission values set forth in the regulation are exceeded, or, if there is no applicable value, when people, animals, plants, etc., would be endangered.

Whenever immissions become excessive, the authorities must produce a plan for dealing with the situation, identifying the emission sources and prescribing the necessary measures for control. The authority can then, in the case of stationary plant, shorten the clean-up time that has been granted or stipulate complementary or stricter emission limits. Emissions from road traffic can be controlled by means affecting the infrastructure, transport operations, or for redirecting or limiting traffic.

The immission limits shown in the table have been set according to the Swiss Environmental Protection Law of 1983, so that immissions

- ☐ Will not harm humans, animals, and plants, nor their collectives and environments.
- ☐ Will not appreciably disturb the wellbeing of the population.
- ☐ Will not damage buildings or



- ☐ Affect the fertility of soil, vegetation, or surface water.

It is also notable that consideration must be taken to the effects of immissions on more sensitive individuals such as children, and those who are sick, elderly, or pregnant. A certain amount of scientific uncertainty on the one hand, and the elevated requirements of the law on the other, have caused the Swiss to include a reasonable factor of safety in all the figures.

As regards the effects of SO_2 on health, the Swiss mainly follow the limits set by the World Health Organization. The strict LRV limits are themselves set with regard to the effect on vegetation. On the basis of results from epidemiological and controlled toxicological research, the Ministry for Environmental Protection has put the permissible long-term load for nitrogen monoxide at 40—50 $\mu g/m^3$, and for the short term at 100 $\mu g/m^3$ (95 per cent annual average). On the assumption that a long-term concentration of more than 2 per cent of COHb will have an unfavourable effect on the condition of angina pectoris sufferers, it has made 2 per cent a universal limit.

Gesundheitsschäden durch Luftverschmutzung (1987)
A compilation of available information on the health effects of air pollutants, based on more than 200 scientific reports. Written by M Schmidt, U Mampel & U Neumann. Published by Institut für Energie- und Umweltforschung Heidelberg e.V. (IFEU), Im Sand 5, D-6900 Heidelberg, F.R.G.

Immission limits as set in the Swiss Clean Air Regulation

Pollutant	Immission limit	Statistical definition
Sulphur dioxide (SO_2)	30 $\mu g/m^3$	Annual average (arithmetical average)
	100 $\mu g/m^3$	95 % of the ½-hour averages for a year $\leq$100 $\mu g/m^3$
	100 $\mu g/m^3$	24-hour average; may only be exceeded once a year
Nitrogen dioxide (NO_2)	30 $\mu g/m^3$	Annual average (arithmetical average)
	100 $\mu g/m^3$	95 % of the ½-hour averages for a year $\leq$100 $\mu g/m^3$
	80 $\mu g/m^3$	24-hour average; may only be exceeded once a year
Carbon monoxide (CO)	8 mg/m^3	24-hour average; may only be exceeded once a year
Ozone (O_3)	100 $\mu g/m^3$	98 % of the ½-hour averages for a month $\leq$100 $\mu g/m^3$
	120 $\mu g/m^3$	1-hour average; may only be exceeded once a year

mg = milligram; 1 mg = 0.001 g
μg = microgram; 1 μg = 0.001 mg
The symbol $\leq$ means less than or equal to.

Directive gone astray

In 1983 the European Commission of the EEC submitted to the Council of Ministers a proposal for a directive on the limitation of emissions of pollutants to the air from large combustion plants. It called for a 60-per-cent reduction of the emissions of sulphur and 40-per-cent for those of nitrogen oxides between 1980 and 1995. It further proposed emission limits for SO_2 and NO_x for new plants, to be introduced in two steps, the first starting from 1985 and the second from 1995.

Nearly half of the member states have however not even signed the UN ECE Sulphur Protocol, as have eighteen other European countries which have thereby committed themselves to reducing SO_2 emissions by at least 30 per cent between 1980 and 1993. A task force, set up by the Nordic Council of Ministers to examine critical loads for sulphur and nitrogen, concluded in 1986 that in order to protect soils and surface water in Europe from acidification, the emissions of sulphur would need to be reduced by at least 80 per cent.

In 1986 the twelve member states emitted altogether more than 18,000,000 tons of SO_2 into the atmosphere!

The European Environmental Bureau (EEB), which is following the EEC negotiations, is now looking for quick progress on the draft Directive. But not for "progress" at the expense of the European environment. What is needed are meaningful controls from an environmental point of view, not merely such as may be acceptable economically.

Since 1983, when the European Commission presented its first proposal to the effect that instead of having one target date (1995) by which SO_2, NO_x and dust emissions were to be reduced by respectively 60 and 40 per cent, it proposed a two-stage program to cut SO_2 emissions by 45 per cent in 1995 and by 60 per cent in 2005, in relation to the 1980 reference levels. The effort required by each member state to achieve the goals of the first stage were to be calculated on the basis of three criteria:

- ☐ The extent to which the country's large combustion plants contributed to total EEC emissions.
- ☐ Specific emission levels versus installed thermal production capacity per capita, corrected by individual use factors per capita GNP, and the level of exported cross-border pollution.
- ☐ The need of further economic development and using "difficult" local fuels on a large scale.

The levels of reduction so calculated would then have to be adjusted to take into account future or existing national programs to reduce emissions. The member states would be divided into three groups according to the reductions of SO_2 required of them, as follows:

Group 1 (50-70 per cent reduction in SO_2 emissions)
Belgium, Denmark, France, the Netherlands, Federal Republic of Germany.

Group 2 (40 per cent reduction)
Italy, United Kingdom.

Group 3 (approximately 10 per cent for Spain, nothing for the others)
Spain, Greece, Ireland, Luxembourg, Portugal.

A decision on the goals for 2005 (end of the second stage) would be made before 1995 on the basis of proposals put forward by the Commission in 1990 and in the light of technical progress.

As regards NO_x emissions, the Dutch proposed a two-stage program to cut EEC emissions by a percentage to be determined during the first stage, with the aim of reducing emission levels by 40 per cent as compared with 1980 levels by 2005. The suggestion was that the allocation of emission-reduction levels for each country be calculated according to the same criteria as for SO_2.

While the British did not change appreciably the contents of the Dutch compromise proposal, the Belgian presidency made some amendments, as can be seen from the table. It maybe noted that only Belgium (B), the Federal Republic of Germany (D), France (F), and the Netherlands (NL) will have achieved a 60-per-cent reduction of SO_2 emissions by 1998, three years after the original date proposed by the European Commission. The net result would therefore not be a European-wide reduction of SO_2 emissions by 60 per cent, but only by 49 per cent if all countries comply.

When the issue was discussed in May 1987 positions had not changed significantly, with the UK, Spain, and Italy still objecting to the timing envisaged for overall reductions in the Belgian compromise proposal, namely a 40-per-cent reduction in total national emissions of SO_2 by 1993

Emission ceilings for SO_2 for all large combustion plants > 50 th/MW authorized before July 1, 1987.

Belgian Presidency compromise proposal

Member state	Total emissions 1993	Total emissions 1998	% reduction in emissions 1980 to 1993	% reduction in emissions 1980 to 1998
B	318	212	− 40	− 60
DK	213	141	− 34	− 56
D	1,335	890	− 40	−60
GR	243	243	− 3	− 3
E	1,737	1,448	− 24	− 37
F	1,116	764	− 40	− 60
IRL	124	124	+ 25	+ 25
I	1,800	1,200	− 26	− 51
L	2	1.5	− 40	− 50
NL	180	120	− 40	− 60
P	360	398	+ 28	+ 28
UK**	2,700	1,940	− 26	−46
EEC	10,118	7,443	− 31	− 49

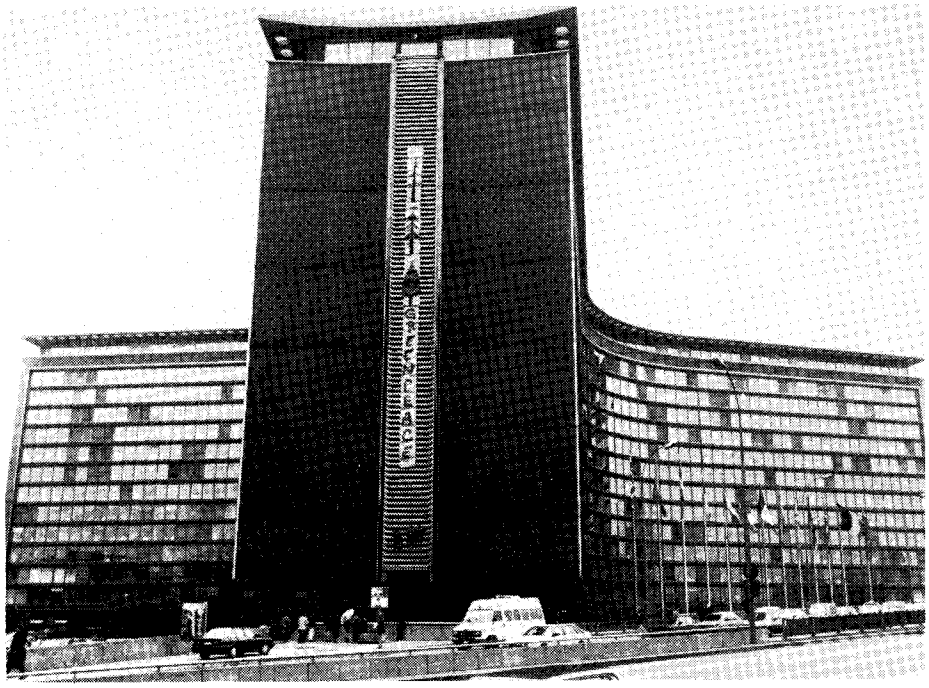


Photo: Greenpeace Belgium/Hans Westerling ©

"If trees could weep". To mark the ending of the European Year of the Environment, during the meeting of the EEC Environmental Council, Greenpeace strung up a banner on the Berlaymont building, opposite the Council Building where the Environmental Ministers meet. The banner, showing a tree gradually losing all its foliage, was intended to represent the death of the European forests. While the EEC continues to display its impotence in dealing with air pollution, millions of European trees are dying.

and 60 per cent by 1998. On the other hand Germany, Denmark, and the Netherlands maintained that such a compromise would water down the original proposal to an unacceptable degree. Thus little has been added to the debate throughout the period of the Danish presidency, with the exception of a Danish proposal to add a third stage aimed at an 80-per-cent reduction by 2010. The Commission indicated that it could go along with such an approach, providing the target date was brought forward, say, to 2005.

There is moreover a move towards narrowing the scope of the directive so as to exclude combustion plants with a capacity of 50 to 100 megawatts, which would allow certain large industrial plants to slip through the net. The European Commission is concerned at this move and will resist it in Council. Wide differences exist in regard to the corresponding proposal for new plants, especially as regards the level of reductions to be achieved and the exemptions allowed.

In the meantime the Environmental Council again met on March 14 this year, this time under a German Presidency. A German compromise proposal would now include concessions for plants that are only used at times of peak demand (which would pose particular problems for France). The compromise also provides derogations in certain cases, as when fuels with a high sulphur content are used, or lignite (Greece), refineries (to win over Ireland). A general threshold of 50 MW is proposed for new plants, with an exemption for installations burning solid fuel in the 50—100 MW range. For reducing emissions from existing plants the Germans have drawn up a program involving the following five-year stages: 1993, 1998 and 2003. Specific targets shall be laid down for each stage, based on the general principle of a 40-per-cent reduction in the first, 60 per cent in the second, and 70 per cent in the third. In the same way as SO_2, NO_x emissions should be reduced in two

Where national contributions to the European NO_x total need the most reduction.

Table below shows where measures are most urgent, in consideration of the area and population density of each country.

The rankings are based on figures for the emissions of nitrogen oxides in 1985 or the latest previous figures. The proposed reductions are from 1980 levels. European environmental organizations have agreed, on the basis of the critical load concept, that the pollutants contributing to the acidification of the environment will have to be reduced by 90 per cent for sulphur dioxide, 75 per cent for nitrogen oxides, and 75 per cent for ammonia. This means permissible levels corresponding to 10 per cent, 25 per cent and 25 per cent respectively of the pollutants emitted in 1980.

A factor for reducing emissions to permissible levels can then be calculated for each country according to area and population.

Country	Reduction factor 1985	(1980)	Present emission level total kton/y	per area ton/km²/y	Emission reduction factors per capita kg/head/y	based on area	capita	mean
1. Netherlands	18.7	(17.2)	548	14.7	37.8	32.1	5.3	18.7
2. Belgium	16.6	(13.6)	385	12.6	39.1	27.6	5.5	16.6
3. F.R.Germany	16.1	(17.1)	2,900	11.7	47.5	25.5	6.7	16.1
4. Luxembourg	13.4	(12.9)	22	8.4	59.3	18.3	8.4	13.4
5. United Kingdom	10.5	(11.1)	1,837	7.5	32.4	16.4	4.6	10.5
6. Denmark	9.3	(9.4)	238	5.5	46.5	12.1	6.6	9.3
7. Switzerland	8.0	(7.4)	214	5.2	32.8	11.3	4.6	8.0
8. France	7.8	(8.5)	2,393	4.4	43.4	9.6	6.1	7.8
9. Italy	7.1	(7.6)	1,462	4.9	25.6	10.6	3.6	7.1
10. Austria	4.8	(4.7)	216	2.6	28.6	5.6	4.0	4.8
11. Finland	4.4	(5.1)	250	0.7	51.0	1.6	7.2	4.4
12. Norway	4.4	(2.6)	215	0.7	51.8	1.5	7.3	4.4
13. Spain	3.8	(3.2)	950	1.9	24.6	4.1	3.5	3.4
14. Portugal	3.6	(4.7)	192	2.1	18.8	4.6	2.6	3.6
15. Iceland	3.5	(4.2)	12	0.1	48.3	0.2	6.8	3.5
16. Sweden	3.3	(4.0)	305	0.7	36.5	1.5	5.2	3.3
17. Ireland	2.4	(2.6)	68	1.0	19.1	2.1	2.7	2.4
18. Greece	2.3	(2.6)	150	1.1	15.1	2.5	2.1	2.3
EUROPE	3.7	(4.0)	19,367	1.7	25.8	3.8	3.6	3.7
EEC—12	7.9	(8.1)	11,145	4.9	34.6	10.8	4.9	7.9
EFTA—6	3.7	(3.6)	1,212	0.9	38.2	2.0	5.4	3.7

Table produced by Harm Smit (Stichting Natuur en Milieu) ©

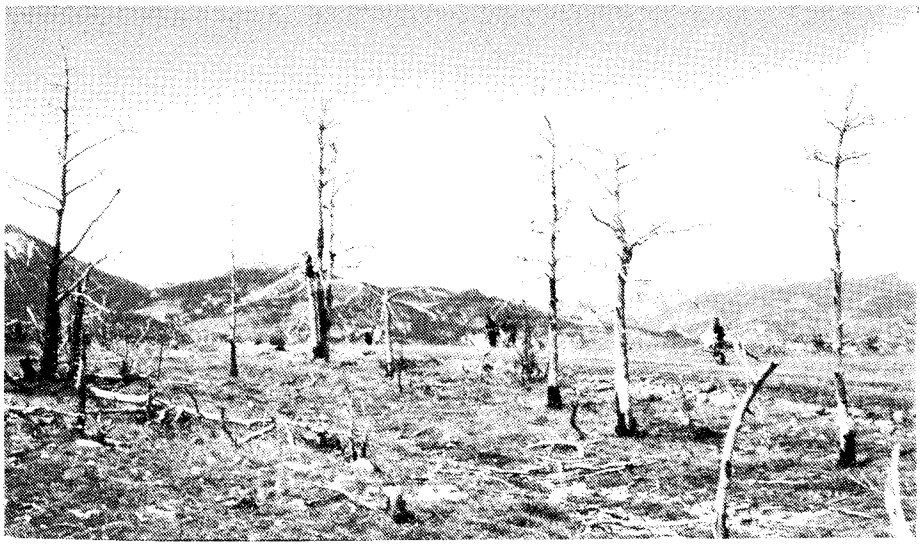
SPAIN

Guilty

For the first time in Spain a company director has been charged and found guilty for an ecological offence and held responsible for the environmental damage caused by a coal-fired power plant. The managing director of the Cercs power plant and the FESCA utility company was sentenced by the Barcelona Provincial Court to one month's imprisonment and fined 30,000 pesetas. He was also ordered to pay 3 million pesetas each in compensation to six farmers whose land had been affected.

The court also laid down that the government's authorization of an increase in the emissions of SO_2 from the Cercs plant, from 9,000 mg/m^3 to 12,500 mg, was contrary to the law.

This is also the first time it has been recognized in Spain that a power plant may have ecological effects on forests. More than 30,000 hectares of forest in the Alta Bergua mountains have suffered damage on account of Cercs emissions.



Large areas of forest in northeastern Spain have been damaged. Photo: Josep Puig ©

The trial was attended by more than a hundred people from the surrounding villages, who joined up with environmentalists in a demonstration outside the court building, where banners were displayed bearing slogans such as "FESCA Board — the forests also want to live."

The sentences are however not yet confirmed, since FESCA has appealed to the Supreme Court. Alternativa Verda, the environmentalist group heading the protests against the power company, has also appealed, because the Provincial Court failed to order FESCA to install flue-gas desulphurization equipment at Cercs.

Josep Puig
Alternativa Verda

For events leading up to the above, see Acid News No. 1, 1988.

► steps, in 1993 and 1998. Specific targets are also to be laid down in each case, with a 25-per-cent reduction in the first stage and 40 per cent in the second.

Although the UK is not the only member state to have serious difficulties with the compromise, it was singled out for criticism for blocking negotiations in other aspects of the proposal until it had won concessions for new plants with a capacity of 50—100 MW. Several ministers at the table showed "anger and frustration" and regretted the UK determination to "completely block progress in this vital area." Ireland and Portugal supported the UK in the matter of a threshold at 100 MW. Differences persist in regard to several other aspects of the proposed deal for new plants, such as the proposed exemptions for plants burning indigenous solid fuels and lignite, power plants used only at times of peak demand, oil refineries and emission curves for plants that expand their production capacity.

As for existing plants, all the member states except the UK could agree to the reduction in SO_2 emissions envisaged by the Presidency for the first two stages, while only five were in favour of a 70-per-cent cut in the final stage (by 2003). Spain had made it clear that its support for all three steps would depend on concessions for its plants burning imported coal. Six countries could agree to reduce NO_x in two stages, while Greece, Spain, Portugal, Ireland, and the UK found the proposed measures too severe. Despite yet another setback, the Germans are seeking to find agreement before the end of their Presidency in June.

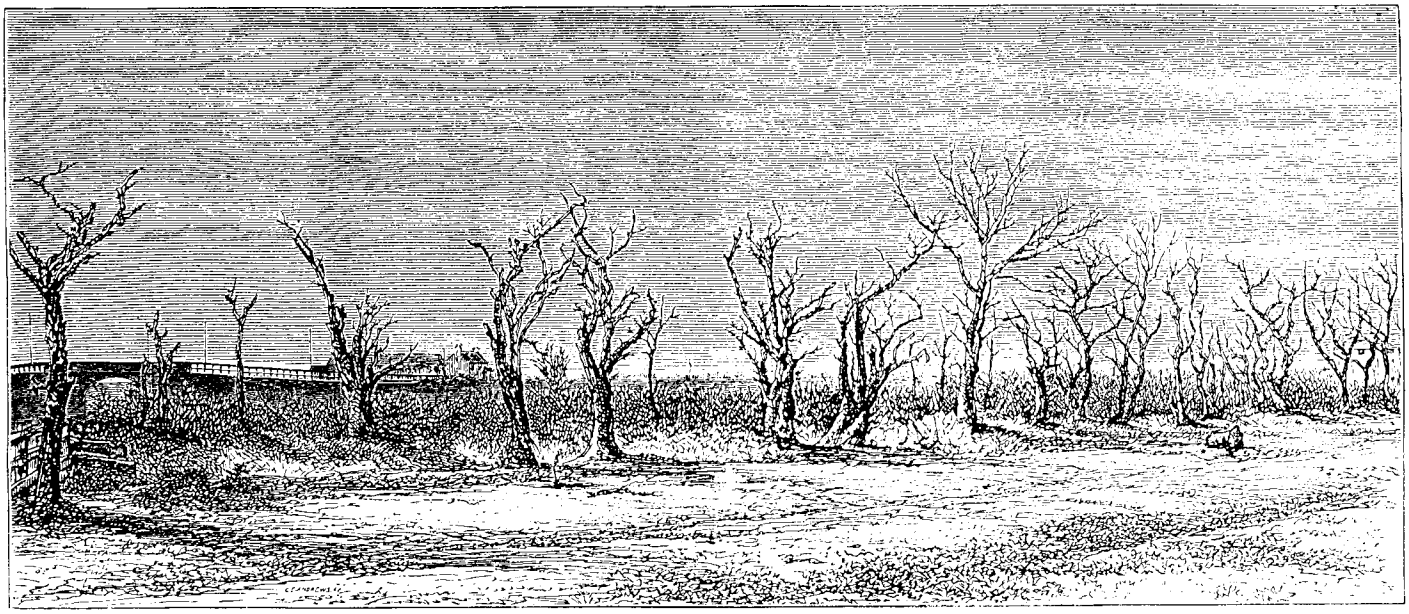
Environmental groups in western and northern Europe are extremely upset over the UK's continual refusal to show consideration for Europe's dying forests and lakes, not to speak of the numerous health problems arising from air pollution. Even British newspapers have criticized the UK government, which provoked the environmental minister, Nicholas Ridley, to issue the following statement: *"We are the tenth on the list of offenders, out of say almost fifteen at the top, so why should we put in the dock and be pilloried like this. The figures are fixed. We have had our major reductions — 30 per cent before 1980 and since then a further 20 per cent. We did it before them, so if you choose a baseline which suits the continentals they can make us look as if we are laggers, but it is they who are laggers because we started first."* This emotional statement shows that the European-wide criticism is hitting the British government, but that they still prefer to react only with polemics and misleading statements.

Reinhold Pape

Article is based on information from Ernst Klatte (EEB), Tine Heyse (Greenpeace) and the European Report.

THE GRAPHIC

June 19, 1875



"A jolly place," said he, "in times of old! But something ails it now: the spot is curst."—WORDSWORTH.

This Engraving of the Remains of an Ornamental Plantation on the Wardley Estate, in the Township of Heworth, in the County of Durham, the property of the Ecclesiastical Commissioners for England, which, like many of the Plantations, Trees, Hedges, and Crops in the neighbourhood, has been destroyed by Noxious Vapours, is (without permission) dedicated to the producers of Noxious Vapours on both sides of the Tyne, in the earnest hope that it may stimulate them to conduct their business in future with a greater regard for the Rights and Feelings of their neighbours as well as for the Public Health.

THE EFFECTS OF NOXIOUS VAPOURS ON VEGETATION

Our engraving, which is a faithful reproduction of a photograph, shows the sad condition to which a once beautiful plantation has been reduced by the baneful action of the foul gases which are emitted from various chemical works on the river Tyne. The muriatic gas given off by the alkali works escapes from the chimney, unites with the moisture of the atmosphere and of the coal smoke, and appears as a white vapour. Being heavier than the air it gradually lessens its altitude, but is often carried by the wind to a great distance. Rain falling through the vapour becomes acidulated. If the vapour comes in contact with vegetation the leaves wither rapidly, and the acid may often be found by washing the leaves in distilled water. But the alkali works are not responsible for the whole of the mischief done. From oil of vitriol works and artificial manure manufactories, sulphurous and nitrous acids are evolved; from copper smelting works sulphuric acid; and sulphurous acid is evolved from the salt cake, or sulphate of soda, so largely used by the glass bottlemakers. From gas works, soap, and caustic soda works, poisonous sulphuretted hydrogen gas is evolved in dangerous proportions, and in the preparation of bleaching-powder chlorine (a far more poisonous gas than muriatic acid) is evolved into the air. The injury thus done to trees, hedges, crops, and pasturage is enormous, in addition to the mischief inflicted upon human health and comfort, and we are told by Dr. Angus Smith that though the chemical works are increasing in number and magnitude, the legal power to repress escapes of gases does not increase with them, although Dr. Smith's investigations show that it is not only possible to reduce these exhalations, but actually economical to do so. The subject has been brought before Parliament by the Northumberland and Durham Association for the Prevention of Noxious Vapours, a similar association established in Lancashire and Cheshire, and the South-Eastern Sanitary Association, at Blackheath, which have jointly submitted some amendments to Mr. Sclater Booth for introduction into his Public Health Bill, which has passed the second reading and now stands for discussion in Committee of the whole House. We feel sure that our readers will wish every success to a sanitary reform which is even more important than that by which we hope one day to prevent the pollution of our streams and rivers, as there are means by which the foulest water can be made pure, while air must be inhaled constantly, and must be taken as it comes.

The Graphic, June 19, 1875