

# Acid News

No 1, Feb. 1988

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



Photo: Sven Ångemark ©

SCAN LINK

## Opposition is growing

The end of January saw the first sentences passed on "tree huggers," environmentalists who had tried to stop construction of a stretch of motorway northwards from Gothenburg in the direction of Uddevalla, on Sweden's west coast. The protest was directed not so much against the motorway as such, but against the fact that it was so obviously intended to be part of a much larger project stretching from Oslo through Sweden and Denmark to the continent.

The tree huggers had taken up positions to prevent trees being felled along the line of the motorway. In this first instance

only eleven were brought to court, but almost 400 more risk being summoned, and almost twice that number took part in the demonstrations.

Tree felling had been prevented for a week before the police took action. Even before construction was scheduled to start a tree-adoption campaign had been set going in order to gather support and money from people who would be unable themselves to take part in the demonstrations. So far more than 20,000 trees have been "adopted" at 10 kronor apiece. Also during the latter part of the year several other actions aimed

at stopping the motorway had taken place, lasting a day or a few hours. They have all been very peaceable, and the charges so far have been confined to refusal to obey police orders. The legal proceedings will nevertheless probably be the most extensive concerning civil disobedience in Swedish history.

The larger project of which the new motorway would form a part is the Scandinavian Link, an idea put forward by the Roundtable of European Industrialists in 1984. It would involve building motorways and bridges so that Oslo and southwestern Sweden could be integrated into

# 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:

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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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the European big industry area so as to permit the optimum in marketing and manufacturing procedures in accordance with the just-in-time principle.

Other "missing links" identified by the Roundtable in its report under that name include the Channel tunnel, further tunnels through the Alps, and a network of rail connections with high-speed trains in central Europe.

There has been strong opposition to the Gothenburg motorway ever since it was proposed as a part of a package for creating new job opportunities after the closure of the government-owned shipyard at Uddevalla in the autumn of 1984. It had in fact been demanded by the Volvo chairman, Pehr G Gyllenhammar, as a condition for locating a new car plant in Uddevalla.

The attempts to stop the work have met with considerable public sympathy for several reasons. The area is suffering badly from acidification and forest damage. The decision to build the motorway had clearly been pushed through by undemocratic procedures. The demonstrations have moreover been entirely non-violent.

Even if work on the motorway could not be halted, it has been delayed and further disruptive actions are planned for the spring. Relative success in western Sweden has also led to tree adopting and civil disobedience around a motorway project in the east coast, just north of Sundsvall. Construction here would despoil Sweden's only river delta, where the Indal flows into the Gulf of Bothnia. The only point of it is a gain of four minutes for motorists.

Opposition in South Sweden to a bridge to link with Denmark over the Öresund — an essential part of the Scandinavian Link project — caused the Social Democratic party in congress last September to postpone voting on the matter, in order to give time for deeper consideration. The government (Social Democratic) had previously been strongly in favour of a bridge-cum-tunnel, and had ex-

pected to be able to sign an agreement with the Danes already last autumn. Now the decision will have to wait until after this year's elections.

The other missing link in the whole project is a road-rail bridge over the Great Belt, between the islands of Sjaelland and Fyn, the construction of which has already been voted by the Danish parliament. Opposition in Denmark to the Scan Link idea has now gathered into an organization under the slogan "Scan Link — Nej tak" (No thanks), and there has lately been much talk about the threat that the combined bridge and tunnel would pose to the exchange of water in the Baltic, which is already considerably polluted. Danish Social Democrats have also started to talk about withdrawing their support

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## *Traffic densities assumed for missing links would make them unacceptable*

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for the Great Belt bridge — in which case it would be the second time this bridge has been voted for, but not built. The first time it was for lack of money.

In Sweden the manufacturers claim that after the requirement for catalyzers or equivalent techniques has become compulsory for all cars from 1989, the whole problem of exhaust emissions will have been solved. Environmentalists are now trying to get a hearing for their opinion that this will not suffice — and that road traffic must consequently be reduced — since the gain from each individual car will quickly be nullified as a result of the total traffic increasing more rapidly than ever before.

Although the minister for the environment had promised a systematic change of transportation policy in Sweden, a new

bill presented at the beginning of January blandly stated that *"no change is needed in the basic principles for traffic policy."* Road and air transportation will continue to receive substantial support. For the first time for many years, however, the railways will get appropriations of a size that will at least help check the steady deterioration in the possibilities of travelling and sending freight in a manner that is kind to the environment. There will moreover now be an environmental levy on air transport, which has been exempt both from value-added and energy taxes.

The only sign of any new move concerning the railways is a proposal for setting up a special company for combined road and rail freight. A disturbing as-

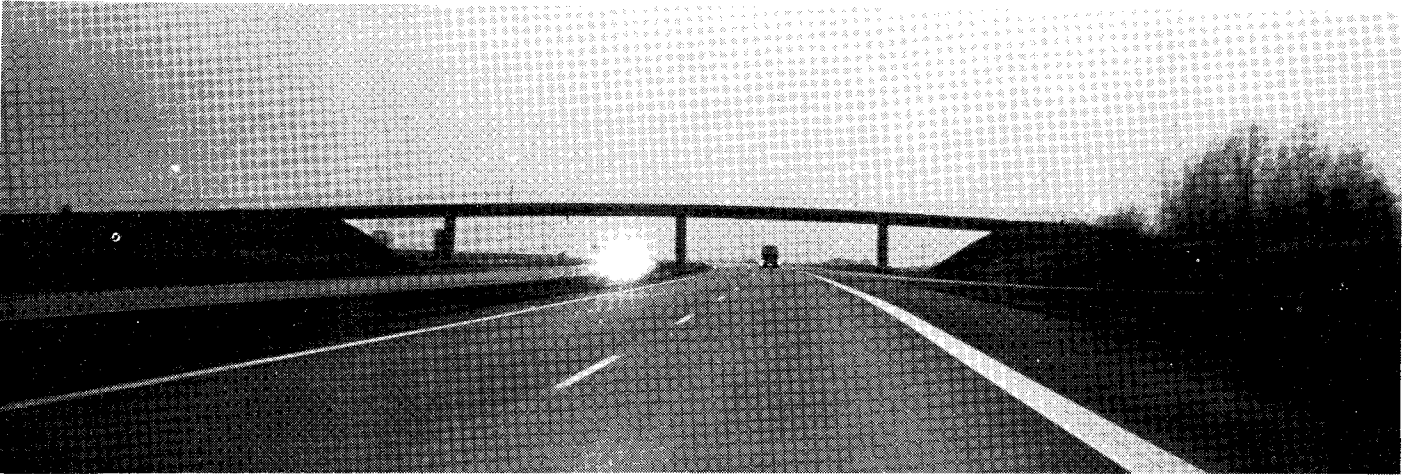
stockholding, transportation), a preview of a system of moving freight between Scandinavia and the continent, an examination of the effects in regard to road safety and the environment, as well as forecasts of the development of traffic in Scandinavia.

It expresses the opinion that there is now sufficient evidence for the Scandinavian governments to take the steps that will enable the Scan Link project to be carried out. Naturally there is nothing in the report that would run counter to the consortium's avowed aim of making the project politically acceptable. The development dogma on which the Missing Link concept is founded assumes that there is only one path to follow, and that to survive the local industries must be successful in

Community standards. Denmark will probably have to answer for this before the Community court, and the outcome will show whether it is considered more important to protect the environment or to permit "harmonized" regulations that favour the car makers.

Fortunately however there is more than one possible course for development. Organizations that are promoting alternative ways of life have been questioning for a long time the idea that economic growth should be the sole criterion for development. They are aiming to start a big research project for investigating *"a possible model for a future society, where social needs, the environment, and responsible utilization of resources will take precedence over merely material liv-*

Photo: Sven Ångemark ©



pect is however that according to this proposal there would only be 6-9 terminals for reloading in the whole of Sweden, so there would still be a great volume of truck traffic. The combined traffic would be confined to whole trainloads to and from the same terminal — the idea being to avoid marshalling, which would upset the just-in-time principle. There is an evident danger of the combined traffic taking over some of the freight that now goes by whole carload direct to industrial sidings, without using trucks.

Last November the consortium that has been promoting the Scandinavian Link project for the last two years presented a new report. It included analyses of the cost to industry of materials administration (such as

world markets. This means that a sufficiently large home market is required both to ensure sales and to have an efficient and reliable network of subcontractors. In order to acquire a successful, unified market, Scandinavia would have to unite with the rest of western Europe. The reasoning is precisely the same as that on which the European Community rests, no matter which countries happen to be formally members. As it is, Sweden, Norway, and Finland are not members.

The growing integration with the Community will soon be put to a significant test. Denmark wants to adopt standards for emission control that will give results at least equivalent to those from the use of catalyzers. These would be stricter than the

*ing standards."* One million kronor made available for this by the Norwegian parliament is one result of the disruptive conflict over the construction of a dam and power plant on the Alta River in the very far north, flowing into the Arctic Ocean, which struck the nation to the heart.

It was by no mere chance either that the Norwegian Prime Minister, Gro Harlem Brundtland, came to be chairman of the UN World Commission on Environment and Development. Although this commission was made up of parliamentarians and officials from twenty-one countries spread over the globe, it managed to agree that *"a new development path (is) required, one that (will sustain) human progress not just in a few places for a*

few years, but for the entire planet into the distant future. Thus 'sustainable development' becomes a goal not just for the 'developing' nations, but for industrial ones as well." (Our Common Future. The Report of the World Commission on Environment and Development. Oxford University Press, 1987.)

Although the commission does not reject the idea of economic growth, it does not regard it as a goal in itself, but makes it conditional. If growth threatens to take an unacceptable direction, it should be avoided. The Scandinavian Link and similar "missing links" are examples of unacceptability. The traffic densities that they assume make them unthinkable, not to mention the damage to the environment that they must cause, and the extravagant using-up of resources in road building, making vehicles, and fuel consumption.

So we know that there are good ways of development. But we need to define them — and see that they are adopted. For that we need to maintain a network of contacts with likeminded individuals and organizations not only in Europe, but the world over.

The tree huggers in western Sweden were greatly encouraged, for instance, to hear that Austrian environmentalists were fighting to stop construction of a motorway at the same time as they were — as well as by the visit in December of two Indian tree huggers, representing the Chipko movement.

Marie Arehag

The Environmental Federation  
in Sweden

The address of the Environmental Federation (Miljöförbundet) is Box 7048, S-402 31 Göteborg, Sweden.

Front page picture shows activists blocking construction of what is assumed to be the first stage of a Scandinavian "Missing link" project.

## Strange attitude on nitrogen emissions

*Refusing to support the most environmentally friendly proposal at Geneva, Norway opts to let emissions go on increasing*

Norway as a champion of the environment had its image dented recently. At the ECE meeting in Geneva last November, Norway merely wanted nitrogen-oxide emissions to be frozen before 1990. This means in effect that the country is willing to accept a continued increase in these emissions for yet another few years. And this was the year in which the World Commission on Environment and Development presented its report on the global future, the hopeful conclusions of which have been "sold" all over the world by the chairman, Norwegian Prime Minister Gro Harlem Brundtland. One wonders if the right hand knows what the left is doing...

The most "environment friendly" proposal put before the meeting was for a 30-per-cent reduction before 1995 (from

country is exceptional in that 40 per cent of its NO<sub>x</sub> emissions come from coastal shipping, and they are calculated to have risen to 47 per cent by the year 2000. There is no known way, either, of reducing them.

The other main source of local emissions is road traffic. Sissel Rønbeck, Minister for the Environment, says that in addition to introducing USA standards for cars (applicable as from 1989 models), the Norwegian government wants to have similar requirements for all diesel-driven vehicles, but that for the short term more extensive measures are out of the question.

There are ways however of bringing about the necessary reductions — by checking the increase in the number of cars, lowering speed limits, restricting the use of cars in certain areas at certain times, extending the rail network, making pollution control in industry more effective, going in for alternative sources of energy, saving energy, etc. The State Pollution Control Authority is intending to make a report to parliament in the spring regarding nitrogen oxides which will include an evaluation of the possible control measures. Much of this will take time. But that is no excuse for allowing emissions to go on increasing.

One reason for Norway's cautious attitude at the Geneva meeting is said to be a fear that the United States and the Soviet Union would withdraw from the proceedings if the demand for quick reductions were pressed too hard.

The Norwegian excuses are strongly reminiscent of the UK

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*It may be asked  
how the country  
can defend its  
attitude*

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1985 levels). The proposers were the Netherlands, Switzerland, Sweden, West Germany, and Austria. But for lack of support from anywhere else, that proposal was quickly reduced to a footnote in the proceedings. Despite its being a compromise between political feasibility and the claims of the environment, conservationist Norway refused it.

It may be asked how Norway can defend its attitude. The

arguments for not joining the 30 Per Cent Club. But at the same time Norway is boasting of its own excellence: *"If the Community had taken the same measures as Norway, the NO<sub>x</sub> problem would be just about solved,"* according to the minister of the environment. But how can any country be expected to impose strict controls as long as there

## ***Norwegian excuses strongly reminiscent of UK arguments for not joining the 30 Per Cent Club***

is no firm international agreement to reduce NO<sub>x</sub> emissions in the immediate future, not just in a few years.

It is in any case questionable whether Norway has any reason to preen itself. According to the calculations of the pollution control authority, Norwegian emissions of NO<sub>x</sub> will have increased by 30 per cent between 1985 and 2000, despite catalytic converters having been made compulsory from 1989. Moreover Norway is among the worst of the OECD countries in respect of allocations for environmental ends.

Norway is one of the countries where most of the NO<sub>x</sub> fallout is imported from elsewhere. Only about 10 per cent is traceable to domestic sources, the remaining 90 per cent coming from the smokestacks and exhaust pipes of others. Surely this should be sufficient reason to support general reductions

## ***The less is emitted in Europe, the less will fall over Norway***

on as large a scale as possible. The less is emitted in Europe, the less will fall over Norway.

In some parts of the country

the soil is now getting too much nitrogen — as appears from a research paper published last year (under the title, The 1000 Lakes Investigation). During the last ten years there has been a marked increase of nitrate concentrations in lakewater in the Sørland district, which scientists believe may be due to the soil having become close to saturation with nitrogen.

Scientists are of the opinion that as we approach the turn of the century, NO<sub>x</sub> will become increasingly important as an acidifying factor. Forest experts fear that the loss of nutrients from the soil will result in damage to the trees. They are also worried about the damaging effects of ozone. The role of NO<sub>x</sub> in the formation of ozone is well known. Estimates of the ecological tolerance limits indicate that NO<sub>x</sub> emissions should be reduced by 50 to 75 per cent, not just by 30 per cent.

The problem does not lie in lack of means, but of political determination. We must realize that if we are to retain our natural environment with its specific characteristics, we shall have to adopt drastic measures and radically change our transportation and energy policies. It won't do simply to patch up the existing arrangements.

A country that has drawn the proper conclusions from the present state of affairs is Switzerland, which declares at Geneva that it could hardly subscribe to a protocol that would lead to increased emissions. If the criterion is how much pollution nature can stand, no protocol can scarcely be worse than a bad one. Those nations that care for the environment must show that they mean business, instead of letting the problem get steadily worse. The Norwegian government must shoulder its responsibility — then perhaps we shall see fewer headlines of the type: "Norway is an environmental sink."

Helen K Sørbye  
The Stop Acid Rain  
Campaign/Norway

## **Latest literature**

### **Acid Rain — Rhetoric and reality (1987)**

A broadly accessible book dealing with both the science and the politics of acid rain, looking particularly at two of the main polluting countries, Britain and the United States. By Dr Chris C Park. 272 pp. Published by Methuen & Co. Ltd, 11 New Fetter Lane, London, England EC4P 4EE. Price 14.95 pounds.

### **Effects and Control of Transboundary Air Pollution (1987)**

Report prepared within the framework of the United Nations Economic Commission for Europe Convention on Long-range Transboundary Air Pollution. 133 pp. Available in English, French, and Russian from United Nations, Sales Section, New York or Geneva.

### **Acid Precipitation — Literature Review 1987**

Nordic Council of Ministers Environmental Report 1987:5. Reviews reports, papers and books on acid precipitation and related phenomena published during 1986. Edited by H. Seip. 215 pp. Published by the Nordic Council of Ministers, Store Strandstræde 18, DK-1255 København K, Denmark.

### **Aktionsplan '87 mot luftföroreningar och försurning (1987)**

Report from the National Environmental Protection Board, giving an account of the measures taken and the actual situation as regards the effects of air pollution, as well as presenting proposals for further measures. In Swedish. Obtainable from the National Environmental Protection Board, Information Section, Box 1302, S-171 25 Solna, Sweden.

### **Hälsoeffekter till följd av försurning (1987)**

A review of current knowledge in regard to the effects on human health of air pollution and environmental acidification. By M Berglund and M Vather. In Swedish. Published by the National Institute of Environmental Medicine, Box 60208, S-104 01 Stockholm, Sweden.

## POLLUTERS

# Topping the list

*Despite its large proportion of nuclear power, Belgium still the biggest acidifier*

From the results of an investigation made by Stichting Natuur en Milieu, the Dutch society for environmental protection, it appears that Belgium is the greatest contributor to acidification in western Europe, closely followed by the Netherlands, the United Kingdom, Denmark, and the Federal Republic of Germany. The outcome of the investigation was presented to the western European ministers at the EEC-EFTA conference on the environment that was held at Noordwijk, Netherlands, last October. The ranking of the countries in regard to their relative responsibility for acidification is based on official figures from the OECD and the United Nations Economic Commission for Europe.

If the damage to the natural environment and edifices and monuments generally is to be stopped, Belgium will have to reduce its acidifying emissions by a factor of sixteen. In the Netherlands, the level of emissions is nearly 14 times higher than it should be, and the corresponding figures for the United Kingdom, Denmark, and the Federal Republic of Germany are respectively 12.6, 11.7 and 11.6. In topping the list, Belgium even leaves notorious air-polluting countries in eastern Europe far behind. Only the German Democratic Republic and Czechoslovakia are worse polluters.

Belgium's placing is even more remarkable in view of the fact that oil and coal-fired power plants only contribute to acidifi-

cation to the extent of 30 per cent, 70 per cent of the electric power being generated in nuclear plants. Belgian acidification is particularly due to chemical industries and refineries at Antwerp, Ghent, Liege, and Charleroi, to fast-growing numbers of

motor vehicles, and the manure produced by intensive livestock farming. So far the Belgian government has shown little sensitivity to environmental issues; some problems, such as the surplus of manure, are simply denied.

*Where the emissions of acidifying air pollutants will need to be reduced most in western Europe (emissions expressed as acid (kilo-)equivalents  $H^+$ ).*

Country	Reduction factor (10 <sup>6</sup> keq/y)	Present emission levels*		Emission reduction factors based on			
		total (10 <sup>6</sup> keq/y)	per area (keq/km <sup>2</sup> /y)	per capita (keq/head/y)	area	capita	mean
Belgium	15.8	29.5	966	3.0	26.3	5.4	15.8
Netherlands	14.0	32.7	876	2.3	23.8	4.1	14.0
United Kingdom	12.7	176.9	723	3.1	19.6	5.7	12.7
Denmark	11.8	23.9	555	4.7	15.1	8.5	11.8
Fed. Rep. Germany	11.6	167.5	674	2.7	18.3	5.0	11.6
Italy	9.6	157.4	523	2.8	14.2	5.0	9.6
Luxembourg	7.5	1.0	375	2.7	10.2	4.8	7.5
Spain	7.1	140.0	277	3.6	7.5	6.6	7.1
France	6.8	164.7	301	3.0	8.2	5.4	6.8
Ireland	6.8	15.2	216	4.3	5.9	7.7	6.8
Switzerland	5.6	11.9	289	1.8	7.9	3.3	5.6
Finland	4.6	20.6	61	4.2	1.7	7.6	4.6
Austria	4.3	15.4	183	2.0	5.0	3.7	4.3
Greece	4.2	21.7	165	2.2	4.5	4.0	4.2
Portugal	4.1	17.3	188	1.7	5.1	3.1	4.1

Permissible levels (based on the emissions of acidifying pollutants in Europe in 1980)\*\*:

per area: 37 keq/km<sup>2</sup>/year  
per capita: 566 eq/head/year

\* Data for 1985 or the nearest previous year for which figures are available.

\*\* Taking 1980 as base year, emissions of SO<sub>2</sub>, NO<sub>x</sub>, and NH<sub>3</sub> must be reduced by at least 90, 75, and 75 per cent.

Table above shows which countries contribute most to the acidification of the European environment and 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 acidifying air pollutants 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 as follows: 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. Subsequently, SO<sub>2</sub>, NO<sub>x</sub>, and NH<sub>3</sub> are expressed in terms of the acidity they finally cause (in acid equivalents as  $H^+$ ) in order to give a picture of the overall reduction of acidifying air pollutants that will be required in Europe.

Consequently, a factor for reducing emissions to permissible levels can be calculated for each country according to area and per capita. Emissions may be regarded as permissible if the calculated reduction is achieved. The permissible levels are shown in the table.

Air pollutant	Emission levels 1980			Permissible levels		
	kton/y*	10 <sup>6</sup> keq $H^+$ /y *	reduction aim	Total * 10 <sup>6</sup> keq $H^+$ /y	per km <sup>2</sup> kg/km <sup>2</sup> /y	per inh. kg/inh/y
SO <sub>2</sub>	58,155	1,810	90 %	180	520	8
NO <sub>x</sub>	19,720	430	75 %	105	440	7
NH <sub>3</sub>	8,425	495	75 %	125	190	3
Acid ( $H^+$ )	—	2,745	—	410	—	—

410 × 10<sup>6</sup> keq  $H^+$  means about 37 keq  $H^+$  per km<sup>2</sup> yearly, and 0.6 keq  $H^+$  per European inhabitant yearly.

\* Totals for Europe

Reduction factors per sector (industry, agriculture, or road traffic) or per acidifying air pollutant can be calculated in the same way. These calculations may indicate where measures are most urgent in any country.

The report entitled "The great acidifiers of Europe," by H.P. Smit and H. van der Kolk, is published by Stichting Natuur en Milieu, Donkerstraat 17, 3511 KB Utrecht, Netherlands.

See also: Acid News No.3, 1987, p 5, pp 8-10.

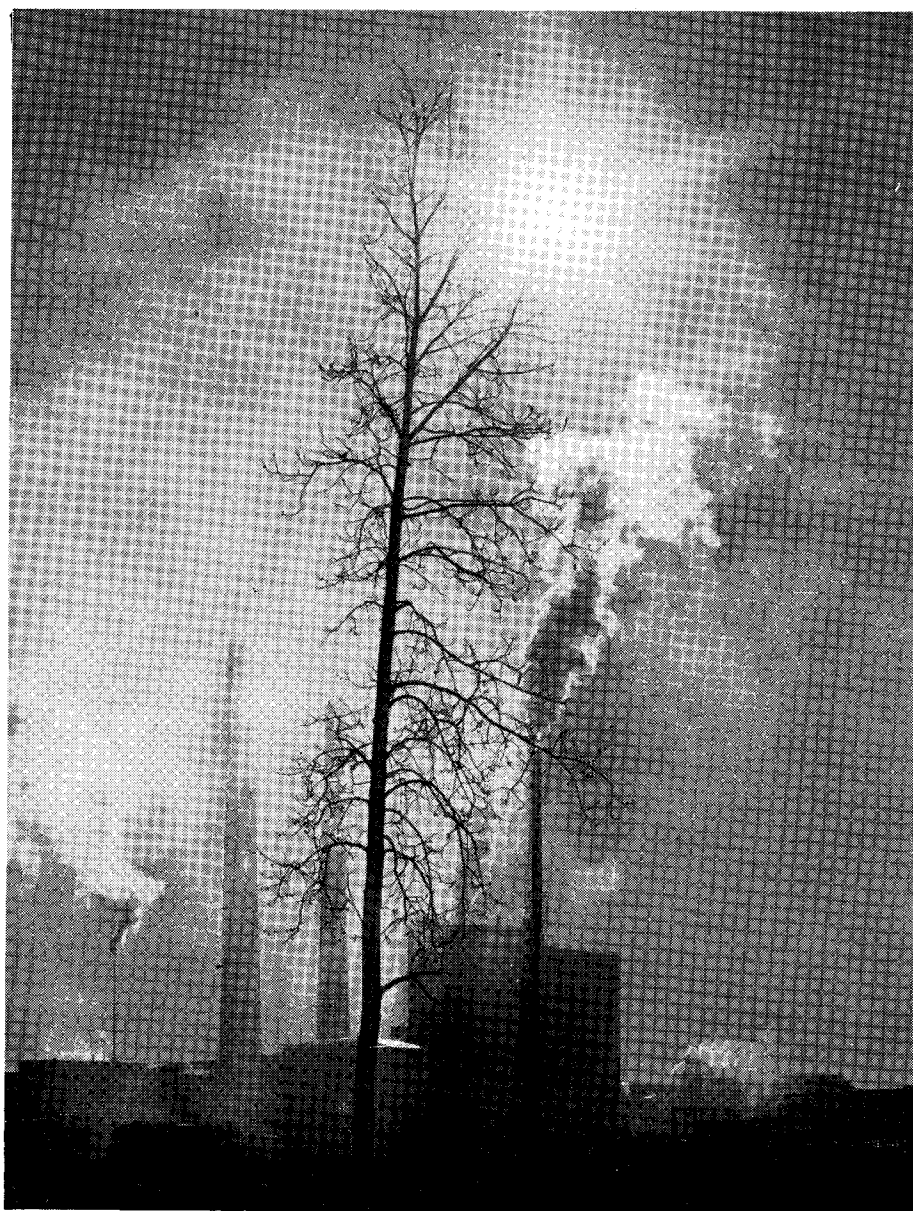


Photo: Antero Laurila ©

The five most acidifying countries in western Europe and the sectors where measures are most urgent. (1) industry, power plants, refineries; (2) road traffic; (3) animal husbandry.

	(1) 	(2) 	(3) 
Belgium	●	●	●
The Netherlands	○	●	●
United Kingdom	●	◐	○
Denmark	◐	◐	●
West Germany	◐	●	○

● Large source of acidification    ◐ Medium source    ○ Lesser source

e Stichting Natuur en Milieu

## More new publications

### Impact of airborne pollution on terrestrial invertebrates (1987)

By U Gårdenfors. The report is mainly a survey of the literature concerning the impact of airborne pollution on terrestrial molluscs. It shows that a pH-interval of 4.5-5.0 or below is critical to many species, and below pH 4.0 almost no species are able to survive. Rare species are more sensitive to acidic habitats than common species. Includes list of acid-sensitive species and more than 500 literature references. Available from the National Environmental Protection Board, Information Section, Box 1302, S-171 25 Solna, Sweden.

### Soil acidification — extent, causes and consequences (1987)

The report summarizing information on observed pH/acidity changes in forest soils in Europe and North America. Analyses their causes and considers recorded or prognosticated consequences for the chemical and biological properties of the soil. Concludes that acid deposition is of great importance for many of the observed changes. Written by M Berdén et al, and obtainable from the National Environmental Protection Board, Information Section, Box 1302, S-171 25 Solna, Sweden.

### 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.

### Ost-West-Symposium Umwelttechnologie (1987)

Report from an international symposium held in Wien, Austria, September 18-19, 1986. 432 pp. Published by Europa Verlag, Altmannsdorfer Strasse 154-156, A-1232 Wien, Austria.

# Environmentalists spell it out

## *Statement on Acidification presented by the NGOs to the EC-EFTA conference on the environment at Nordwijk, Netherlands, last October*

Acidifying and photochemical air pollution is threatening Europe. More and more areas in Europe are becoming severely affected, and the effects are leading up to big catastrophies in coming decades. After a long period of steady acidification the environment has lost its resilience, and far-reaching, effective measures will have to be applied.

In many areas in Europe the impacts of acid rain are already disastrous, ecologically as well as economically. The vitality of the forests in Europe is being harmed on an ever larger scale. In West Germany, the Netherlands, and Switzerland, and in large parts of Austria more than half of the forest is damaged.

Forest output is decreasing and open-air recreation is at great risk. Erosion is a serious threat in the Alps and other mountain areas.

There is large scale acidification of lakes and fens. In Scandinavia 15,000-20,000 lakes are already acidified, and in the Netherlands no less than three-quarters of the fens.

Not only is the shallow groundwater affected, but the deep groundwater as well. The drinking water supplies are at

risk on account of pollution by nitrates and aluminium.

Public health is not only endangered through the drinking water, but also from the frequent occurrence of high ozone concentrations throughout Europe.

Moreover, agricultural production has decreased as a result of air pollution by some 5 per cent. The subsequent losses in the Netherlands are estimated to amount to about 300 million US dollars a year. Furthermore our historic monuments are affected and the damages can only be restored in part and at a high cost.

Leading scientists, including those of the ECE and the Nordic Council, are nowadays agreed on the critical loads of pollutants for the most sensitive soils in Europe. (See Acid News No. 3-4/86, and No. 4/87.)

We conclude that if the most sensitive soils are to be protected, deposition levels have to be brought down to an annual load of 5 kg per-hectare (350 equivalent acid/ha/yr) at the most for both sulphur and nitrogen (protection level A). Levels up to 10 kg S and 10 kg N (protection level B) may stop the impact on less sensitive soils, but will still be insufficient for the most sensitive soils in Europe, with all the consequences for vegetation and the quality of the groundwater.

Currently the levels are being exceeded throughout Europe. The average annual depositions of sulphur (S) and nitrogen (N) are 20-40 kg and 20-50 kg per hectare respectively. In some areas the figures can be as high as 50-120 kg for sulphur and 70-300 kg for nitrogen.

Taking cognizance of current scientific knowledge, and in view of the fact that there are many areas with poor sandy soils in Europe, the NGOs are of the opinion that the present deposition levels will have to be brought down to the level of crit-

ical loads for the most sensitive soils in order to protect the environment in these areas effectively. This aim can only be achieved through a drastic reduction of the emissions of acidifying substances from industry, road traffic, and agriculture.

Emissions of sulphur dioxide will have to be reduced by at least 80 per cent compared with 1980 and by at least 90 per cent if we are to protect the forests, vegetation, and surface waters in those parts of Europe with the most sensitive soils. Nitrogen oxides will have to be reduced by at least 75 per cent. In areas with highly concentrated farming, the emissions of ammonia should also be reduced by 75 per cent from 1980. In view of the long-term effects of acidifying substances, these reductions should be brought about as soon as possible.

Ozone is also an air pollutant, closely related to so-called acid rain. Ozone pollution is mainly caused by nitrogen oxides and hydrocarbons emitted from road traffic. It causes just as severe problems as acidification. At present the yearly average concentration of ozone in the air is three times as high as it was a century ago. Nowadays peak concentrations far in excess of 120  $\mu\text{g}/\text{m}^3$  (300-600  $\mu\text{g}/\text{m}^3$ ) are not uncommon in Europe, and may harm plant and animal tissue. Peak concentrations also affect human health and may cause respiratory problems especially to asthmatics and children. Moreover, long-term exposure even to lower concentrations may be very harmful.

Recently scientists have shown that some crops are affected by ozone concentrations of as low as 60  $\mu\text{g}/\text{m}^3$ . In 1983 the average yearly ozone concentration in the Netherlands was 70-80  $\mu\text{g}/\text{m}^3$ .

Many scientists now agree that it is evident that the present concentrations of ozone in the air may harm trees and

other natural vegetation. To reduce concentrations to acceptable proportions, not only must nitrogen emissions be reduced by at least 75 per cent, but also those of hydrocarbons.

## ***We are urging the conference delegates to take the following measures***

1. To join the UN-ECE 30 Per Cent Club for SO<sub>2</sub>, and to announce that much greater reductions will be achieved before 1993. The Western European countries that have not yet signed the UN-ECE 30 per cent protocol for sulphur reduction are: Greece, Ireland, Portugal, Spain, and the United Kingdom. Belgium, Italy, Luxembourg, and Switzerland have signed the protocol but have not ratified it.

2. To support a 30 per cent club for nitrogen oxides and, moreover, to state that considerably greater reductions are necessary and will be made before 1995.

3. To fit all existing and all new large combustion plants of over 300 MW thermal capacity, such as power plants, refineries, and large industrial plants, which are fired with brown coal, coal, or oil, with flue-gas desulphurization equipment (FGD) or similarly effective techniques before 1995. To equip all existing and new oil and coal-fired combustion plants with NO<sub>x</sub>-reducing techniques, such as low-NO<sub>x</sub> burners, in-furnace reduction and selective catalytic reduction.

4. To apply the following emission standards both for sulphur and nitrogen oxides for all new and existing large combustion plants of over 300 MWth with a long remaining life: 70 grams SO<sub>2</sub> per gigajoule (70 grams SO<sub>2</sub> per 10<sup>6</sup> BTH) and 140 grams of NO<sub>x</sub> per gigajoule. Moreover, to adopt NO<sub>x</sub>-emission standards of 70 grams NO<sub>x</sub> per gigajoule for

all large combustion plants to be built after 1990.

Note. 70 g SO<sub>2</sub> per gigajoule means a 90-per-cent reduction if coal with a sulphur content of 1 per cent is used. Such reduction is technically feasible and has already been achieved in several plants. Many companies can make the highly efficient equipment for doing this.

Reduction to 70 g NO<sub>x</sub> per gigajoule (200 mg NO<sub>x</sub>/m<sup>3</sup>) and less for new and existing coal-fired installations is now technically feasible and already obligatory in West Germany (Beschluss, April 5, 1984). The standards for oil and gas-fired installations in West Germany are 150 and 100 mg/m<sup>3</sup>.

5. To set emission standards for nitrogen oxides and hydrocarbons for all motor vehicles, both petrol and diesel driven, similar to the US federal standards and at a later stage similar to the 1987 Californian standards.

Three-way catalytic converters must be made obligatory not only for vehicles with an engine capacity of 2 litres or more, but also for cars with medium-sized and smaller engines. NO<sub>x</sub> emissions from diesel-powered cars must also be limited. The emissions at higher speeds must not exceed 0.6 g NO<sub>x</sub>/km.

6. To institute speed limits and to control them.

A limit of 100 km/hr on motorways must be the goal for all European countries. Higher speeds entail higher NO<sub>x</sub> emissions. Emissions are doubled by an increase in speed from 80 km/hr to 120 km/hr. West Germany is now the only country in western Europe without any speed limits on motorways.

7. To change national policies in regard to road traffic, i.e. the upward trend in the volume of traffic must be stopped and reversed.

It is imperative to decrease traffic volumes, because technical measures alone are insufficient for achieving the goals.

8. To take adequate measures in the short term to bring about drastic reductions in the emis-

sions of ammonia from the livestock industry and dairy farming in areas with a high density of animals.

Technical measures that are either already available or will be within a few years are: closed manure storage; injecting manure just beneath the surface of the soil instead of spreading it over the surface; ploughing under the manure immediately after spreading in order to prevent NH<sub>3</sub> evaporation; using bio-filters or other equipment to clean the air in the barns.

9. To restructure agriculture, by limiting livestock densities and promoting farming practices that are environmentally sound.

Technical measures alone are insufficient to reduce the emissions to acceptable proportions. The increasing pollution of the groundwater by nitrates in areas where cattle farming is highly concentrated will make radical measures inescapable. In the Netherlands, Belgium, and Denmark particularly, restructuring will have to be undertaken on a national level, whereas in France, Germany, Great Britain, and Italy regional solutions will be necessary.

We are of the opinion that the above political measures will be inevitable if we are to save and restore forests, soils, and lakes, to guarantee groundwater quality, to secure public health and to prevent historic monuments from becoming ever more severely damaged.

October 1987

***Stichting Natuur en Milieu, Utrecht***  
***European Environmental Bureau, Brussels***  
***Bond Beter Leefmilieu, Brussels***  
***Greenpeace International, London***  
***Friends of the Earth Ltd, London***  
***Vereniging Milieudefensie, Amsterdam***  
***WISE, Amsterdam***

# Declining trend of emissions reversed

In 1986 the emissions of sulphur dioxide in the United Kingdom were 180,000 tons more than they had been the year before, and thus were the most since 1982. Power plants, which usually account for a good 70 per cent of the total discharges of sulphur, were responsible for half of the increase in 1986.

For a long time both Sweden and Norway have been highly critical of the United Kingdom's refusal to underwrite a United Nations agreement to reduce emissions of sulphur dioxide by at least 30 per cent between 1980 and 1993. That agreement has already been signed by nineteen countries both in east and west Europe.

At an international conference on air pollution in Munich in June 1984, the then minister of the environment, William Waldegrave, had said that the British government's aim was to reduce emissions both of sulphur and nitrogen oxides by 30 per cent by the end of the nineties. As may be seen from the table the United Kingdom had in fact been gradually reducing its emissions from an all-time high in 1970 right up to 1984. Since then, however, the trend has been reversed, so that they are now increasing again. The reason is thought to lie in the country's economic recovery, with increasing industrial output and increasing production of electricity.

The pressure to reduce emissions does not only come from members of the 30 Per Cent club. There is also a proposal within the European Community for reducing emissions of air pollutants from large combustors (with a thermal capacity of more than 50 MW). This proposal has been batted backwards and forwards ever since it was presented in December 1983, and the

latest in a series of compromises was that put forward by Denmark in October last year. This would require the United Kingdom to reduce its emissions of sulphur dioxide from large combustors from 3.6 million tons in 1980 to 2.8 million in 1993, and 2.4 million tons in 1998. The total of emissions from such plants in the UK is now around 3.1 million tons a year.

Total UK emissions, millions of tons

Year	SO <sub>2</sub>	NO <sub>x</sub>
1975	5.13	1.83
1976	4.98	1.87
1977	4.98	1.90
1978	5.02	1.93
1979	5.34	2.03
1980	4.67	1.93
1981	4.22	1.86
1982	4.01	1.81
1983	3.69	1.82
1984	3.54	1.69
1985	3.56	1.84
1986	3.74	1.94

SO<sub>2</sub> = sulphur dioxide  
NO<sub>x</sub> = nitrogen oxides,  
(expressed as nitrogen dioxide equivalent)

Last September the British government announced that it would henceforth require effective flue-gas cleaning of sulphur for all new power plants, and that three of the existing large coal-fired plants, with a combined capacity of 6,000 MW, were to be fitted with equipment for flue-gas desulphurization.

The plants that are to be so retrofitted are two at Drax in North Yorkshire and one at Fiddler's Ferry in Cheshire. It is intended that the work shall be completed by 1997, at a cost of 600 million pounds. The reduction of sulphur-dioxide emis-

sions from the three plants will amount altogether to about 360,000 tons a year, corresponding to about 8 per cent of the country's total emissions in 1980.

With its capacity of 4,000 MW, Drax is the largest coal-fired plant in Europe. It consumes 11 million tons of coal a year, and the new desulphurization equipment will remove more than 90 per cent of the sulphur dioxide from the flue gases, which at present amounts to about 250,000 tons a year. Here the Central Electricity Generating Board intends to use the wet desulphurization method. This involves first making a slurry of water and powdered limestone, through which the flue gases are made to pass. The sulphur dioxide in the gases reacts with the limestone slurry to form gypsum (calcium sulphate).

The consumption of limestone is estimated to be 700,000 tons a year, and the production of gypsum about 1.1 million tons — involving transport both to and from the power station. Already up to thirty-eight trains a day are needed to deliver coal to Drax, and according to the Board, five more will be needed (for limestone and gypsum) when desulphurization is working.

The public as well as environmentalists in Yorkshire have been greatly worried lest the CEGB would want to get its limestone from quarries in the Yorkshire Dales and Peak District national parks, which are not far from the power station. Local opinion has therefore called on the Board to consider instead a method of desulphurization that does not need limestone and does not give rise to such quantities of waste — namely, the Wellman-Lord system. This system re-uses the chemical reagents — sodium sulphate or caustic soda — which remove the sulphur dioxide from the flue gases, with consequently much lower requirements of raw material than the wet FGD method that the CEGB prefers.

The Wellman-Lord method gives a residue of pure sulphur dioxide gas, which can be con-

verted either to pure sulphur or sulphuric acid. A 90-per-cent cleaning of the flue gases at the two Drax plants would enable a production of some 100,000 tons of sulphur annually. In 1986 more than 600,000 tons of sulphur were imported by British companies for the production of sulphuric acid.

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## *Even the modest aims declared in 1984 may not be achieved*

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After the outcry in the local press, the CEEB has however announced that it will not be obtaining its limestone from quarries in the national parks. But the CEEB has yet another problem — how to get rid of all the gypsum that will be produced. The Board is counting on being able to sell it as raw material to gypsum-board makers. They on the other hand think that they ought to be paid for relieving the CEEB of a difficult waste problem. No one knows what the outcome will be.

According to the Board's plan, Drax will be installing desulphurization equipment in two stages. The first stage is expected to be finished by 1993, and the second at the end of 1995. This timetable may be upset

however by a possible public inquiry during the summer.

Forecasts of the country's emissions of sulphur dioxide are subject to a number of factors, and are therefore uncertain. Should the economy continue to improve and industrial output to increase, and should no further measures be taken to reduce emissions, there will be a great danger of the emissions of sulphur dioxide continuing to increase even in the nineties.

If on the other hand there should be more retrofitting of FGD, and importing of coal with a low sulphur content, as well as a greater use of natural gas, it should be quite possible at least to have halved the country's emissions sometime during the nineties.

There is also a considerable potential for reductions in a more efficient use of energy. According to ENDS Report, the amount of energy needed to produce each pound of gross domestic product has declined by about a third since 1970 — and each additional 5-per-cent reduction would, if it averted some of the need for fossil-fuelled power generation, alone eliminate annually 200,000 tons of SO<sub>2</sub> emissions.

The emissions of nitrogen oxides have also increased during the last two years. The 1.94 million tons emitted in 1986 was the next highest figure for any one year, only that for 1979 being higher. See table. The greater part of the increase, amounting to 100,000 tons over 1985,

came from power plants (48,000 tons) and road traffic (44,000 tons). These two sources each account for a good 40 per cent of the total emissions of nitrogen oxides.

In order to reduce emissions of NO<sub>x</sub>, during the next ten years the CEEB will be installing low-NO<sub>x</sub> burners at twelve of its largest coal-fired plants. This should result in an average reduction of 30 per cent from power generation, corresponding to a reduction of about 12 per cent in the country's total emissions.

There is just as much uncertainty in regard to the emissions of nitrogen oxides from the UK power plants as there is for sulphur. Added to this is the uncertainty as to the future emissions from road traffic. The reductions that may be expected as a result of the introduction of the new Community regulations for

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## *Danger emissions will continue to increase even in the nineties*

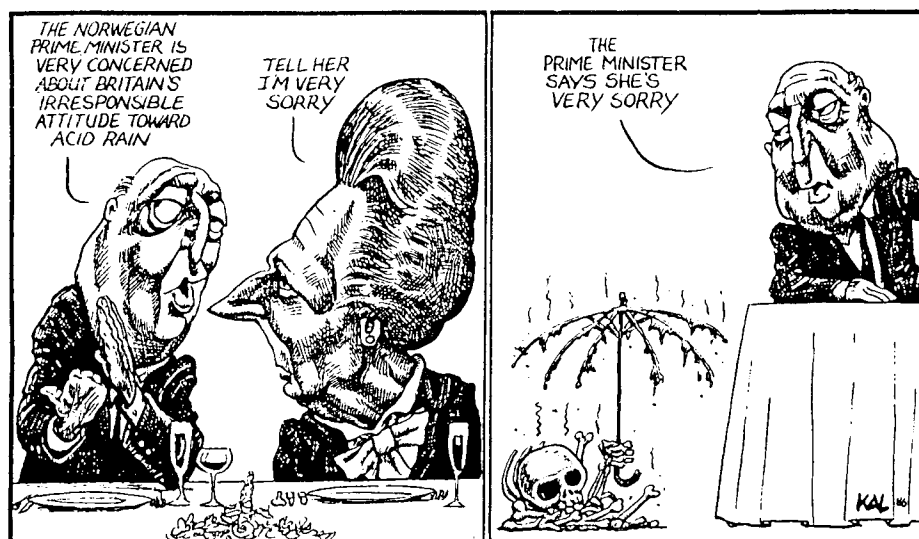
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petrol-driven cars may well be offset, wholly or in part, by the increase in traffic.

As things now look, the result of the conservative government's air pollution policy will be that the country will not even achieve the very modest aims that were declared in 1984 — to reduce emissions both of sulphur and nitrogen oxides by 30 per cent by the end of the nineties.

The United Kingdom will thus continue to spread acidifying sulphur and nitrogen pollutants over other countries in Europe during the nineties as well — thus further damaging its reputation internationally. The epithet, "the dirty old man of Europe," will regrettably still be applicable, it seems, for quite a number of years to come.

Christer Agren



# Public worried

From a poll recently carried out in the United Kingdom, it appears that the British public is worried about the effects of acid rain, and would like to see the country's emissions of airborne pollutants drastically reduced.

Some 1200 persons were interviewed for the purposes of the poll, which was conducted by the Harris Research Centre on behalf of Sweden's Environmental Protection Board and the Norwegian Department of the Environment.

Because a great part of the acidifying sulphur and nitrogen pollutants that fall over Scandinavia comes from the UK, Sweden and Norway have been carrying on informational activity for several years with the aim of persuading the British to reduce their emissions of these substances.

Outstanding findings of the poll were:

□ Awareness of the acid rain problem is widespread in the UK, and is steadily increasing. Almost 80 per cent of the respondents knew about acid rain, more than half of them having become aware of it during the last three years, and 17 per cent in the last year.

□ Most people were also aware of the causes — the emissions of sulphur from coal-fired power plants being most often cited (by 64 per cent). Factories came a close second, being named by 63 per cent of the respondents, and road traffic fourth (45 per cent). People showed a lack of knowledge on the other hand in supposing that nuclear power plants were a cause of acid rain (47 per cent).

□ People in Britain are obviously worried about the effects of acid rain, the effects on wildlife and plants being the cause of greatest concern. Here 90 per cent of the sample said they were "very" or "fairly" con-

cerned. Almost as many (89 per cent) expressed the same degree of concern for forests and human health, and 87 per cent for the effects on lakes and rivers and agriculture. That no more than 73 per cent were "very" or "fairly" concerned about historic buildings is perhaps rather surprising.

□ Considering only those who were "very concerned," human health tops the list (71 per cent), followed by wildlife and plants (62 per cent), agriculture (60 per cent), forests (57 per cent), with historic buildings again coming last (37 per cent).

□ People are quite well aware which countries are most affected by Britain's acid emissions. Norway and Sweden were put first (62 and 58 per cent respectively), followed by West Germany and France (both 31 per cent).

□ Concern about the effects of UK emissions in other countries is almost as great as it is about the effects in Britain itself. While 89 per cent of the respondents said they were "very" or "fairly" concerned about the effects

in the UK, 82 per cent were equally concerned for other countries.

□ The UK is felt to have a poor reputation both at home and abroad for its acid rain policy. Only 1 per cent thought its record at home was "very good," while 60 per cent considered it "poor" or "very poor." Still more, or 72 per cent, believed the country's reputation in Europe to be "poor" or "very poor."

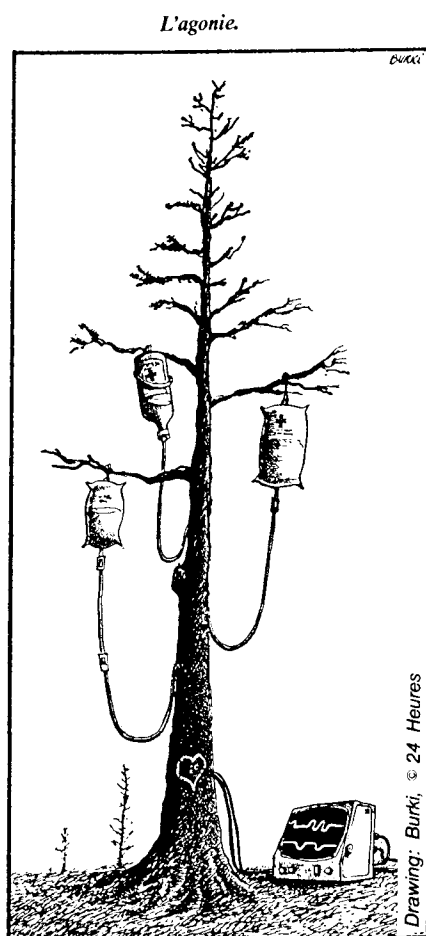
□ There is evidently a strong opinion in favour of measures to control emissions. The installation of equipment for doing so at twelve of the country's largest coal-fired power stations was supported by 84 per cent of those interviewed, even though it would mean an increase in electricity prices of 5-10 per cent. Only 9 per cent were against, and it may be worth noting that Conservative and Alliance voters were equally in favour (86 per cent), and somewhat ahead of Labour's (80 per cent).

□ On being told that twenty-one countries had committed themselves to reducing emissions of sulphur by at least 30 per cent, and that West Germany was planning to go as far as 60 per cent, most people (92 per cent) wanted to see the UK taking far-reaching measures. Only 13 per cent felt a cut of 30 per cent in the emissions from coal-fired power plants was enough. A reduction of 60 per cent was preferred by 44 per cent, and 80 per cent by as many as 35 per cent of the respondents.

□ There was also strong support for action on vehicle emissions. When told that some European countries offered financial incentives for the use of devices that greatly reduce emissions of pollutants from vehicles, 92 per cent thought the UK should do the same.

The results of the poll will be doubly embarrassing to the Conservative government, since it will now have to justify the recent upturn in the UK's sulphur and nitrogen oxide emissions both at home and abroad.

Christer Ågren



## Danger ignored

On September 17, 1987, after seven years of preparation, a US government report on the causes and effects of acid rain was presented by the National Acid Rain Precipitation Assessment Program (NAPAP). Claiming that acid rain is restricted to only a few areas in the north-eastern United States, the executive summary concludes that the problems resulting from acid rain are unlikely to worsen in the near future. The report denies that acid rain threatens US lakes or forests, except for minor "multiple stresses" at high elevations.

The assertion that the United States faces little danger from acid rain was immediately attacked by critics, who argued that the report's findings will only promote a token response to an urgent issue.

The NAPAP report concludes that controls on emissions of sulphur and nitrogen oxides are unnecessary. The report's opponents contend that this conclusion is based on a misrepresentation of scientific evidence. Many scientists have denounced the report as inaccurate and misleading, and have argued that the Reagan Administration is attempting to avoid implementing expensive pollution controls, at the expense of the environment. When asked their opinions as to the credibility of the report, some scientists told the New York Times that they were reluctant to criticize the report publicly, because they might lose their federal grants.

The authors of the NAPAP report and its critics disagree as to what constitutes an acidified lake. By using a pH of 5.0 or less to classify a lake as "acidified," the NAPAP executive summary states that no more than a few US lakes are acidified to a "damaging degree." A "damag-

ing degree" is defined as conditions in which fish die, resulting in economic loss. On the other hand, according to Jim Gibson of Colorado State University, a pH of 6.0 should be used to classify a lake as acidified, since at this level a disruption in the food web occurs, leading eventually to the loss of fish.

The report's executive summary has also been attacked for providing premature and erroneous conclusions on acid rain's effects on forests. Although the report may correctly conclude that acid rain causes no harm to seedlings or to tree foliage at "regional ambient levels," it overlooks the existence of clouds over New England that register pH levels as low as 3.2. These conditions are responsible for considerable forest damage, but were not incorporated in NAPAP's conclusion.

The findings of the US report have also been challenged by many Canadian scientists. These scientists argue that the NAPAP executive summary ignores the impacts on Canada of acid rain precursors originating in the United States. At present, 14,000 Canadian lakes are considered acidified and 150,000 others show signs of biological and chemical damage. Half of Canada's acid rain originates from US sources.

Canada is undergoing a major program to curb its domestic emissions of sulphur and nitrogen oxides. Canada plans to cut its emissions of sulphur dioxide by 50 per cent by 1994, and those of nitrogen oxides by up to 45 per cent by the year 2000. If these goals are met, the trans-boundary flow of Canadian acid rain to the United States will be greatly reduced.

By failing to recognize acid rain as a danger, and by ignoring the international impacts of US sulphur and nitrogen oxides, the NAPAP report has invited strong criticism among North American scientists. This has, in turn, greatly undermined the report's credibility.

Peter Drekmeier and  
Armin Rosencranz

## And still more

### Mindre kväveoxider från förbränning (1987)

Produced jointly by the National Environmental Protection Board and the National Energy Administration, report presents proposals for measures to bring about a decrease in NO<sub>x</sub> emissions from combustors by 40-50 per cent between 1980 and 1995. In Swedish. Obtainable from the National Environmental Protection Board, Information Section, Box 1302, S-171 25 Solna, Sweden.

### Nya svavelkrav vid förbränning (1987)

A similar joint proposal, but dealing only with sulphur emissions from energy production. New emission standards are proposed to be introduced gradually from 1993 to 1997. In Swedish. Obtainable from the National Environmental Protection Board, Information Section, Box 1302, S-171 25 Solna, Sweden.

### Materialschäden durch Luftverunreinigungen (1987)

An extensive literature review on the effects of air pollution on different materials. Nearly 1000 literature references are given. By J Fritz, D Schmitt, & K-F Ziegahn. Published by Ecomed-Verlag, Justus-Liebig Str. 1, D-8910 Landsberg/Lahn, F.R.G.

### Acid deposition in the northern hemisphere (1987)

Examines the phenomenon of acid deposition; the distribution and magnitude of sources, the range of environmental effects, both actual and potential, direct and indirect, and the wide range of technical and other controls that are available to reduce the emissions of pollutants contributing to the phenomenon. 57 pp. Written by Longhurst, Green, & Lee, and published by the Acid Rain Information Centre, Dept of Environmental & Geographical Studies, Manchester Polytechnic, Chester Street, Manchester, England M1 5DG.

# Coordinated action 1988

For the sixth year in succession environmental groups all over Europe — informally organized in the Air Pollution Network (Airplan) — have proclaimed an International Acid Rain Week; 28 May to 5 June 1988. This time it will take place in connection with World Environmental Day, June 5, organized annually by United Nations Environmental Program (UNEP) since 1972.

That forests in Europe are dying is now generally known. People are aware too — at least in central and northern Europe, of the causes and the consequences for our society. Governments are still slow on the other hand in developing measures for pollution control, and the emissions of sulphur and nitrogen oxides continue to increase in many countries. An international convention such as the UN European Economic Commission's Nitrogen Oxides Protocol turns out to be quite toothless, allowing for increases in  $\text{NO}_x$  emissions until the late 1990s.

Much more national and international pressure will be necessary to really change government policies, as well as every citizen's attitude concerning car traffic. We cannot allow the increase of 50 per cent in private car driving that is predicted for the whole of Europe up to the year 2000. If we do even those countries that plan to decrease their  $\text{NO}_x$  emissions by 30 per cent in the next few years will not achieve that target either.

But there are also problems connected with air pollution, of which the general public are still largely ignorant, such as the effects of polluted air on human health, the critical-loads discussion, and the contributions of each country to transboundary air pollution.

Many environmental groups are occupied with their own national campaigns, maybe sometimes even feeling rather isolated from others or frustrated about the lack of public reaction. The International Acid Rain



Photo: Andrew Kerr ©. Cyclists demonstrating in Munich.

Week could give us the possibility of doing something together in solidarity again, to evaluate internationally where we stand in our campaign for cleaner air and to develop new strengths. That is why we hope all environmental groups will associate with the week again and plan some effective public actions. We propose marking Acid Rain Week 1988 in three blocks, each under a special theme:

**1. 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.

**2. 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.

## Cancer risks from exhaust emissions

In 1982 some 40 per cent of the recorded deaths from lung cancer in Switzerland were due to the emission of pollutants from road vehicles. In 1976 it was only 10 per cent.

These are the findings of an investigation carried out by the Laboratory for Solids Physics at the Institute of Technology in Zürich. Polycyclic aromatic hydrocarbons, which have long been known to cause cancer, were identified as an especial cause. Such particles can even penetrate through the closed windows of dwellings. One hour's exposure in the streets or ten hours indoors in a city can be just as dangerous as smok-

ing one cigarette.

The lung-cancer frequency in those parts of Basel where there is heavy traffic is 40 per cent higher than in the surrounding country. It was shown already in 1967 that there was a connection between cancer and vehicle exhausts. Now it is clearly evident that high death rates from cancer are indeed traceable to such emissions.

Umwelt 2000  
Kleine Senckenberg Reihe 3  
Frankfurt am Main (1986)

See also: Acid News No.3-4, 1986, pp 1-5.  
No.1-2, 1987, pp 12-21. No.3, 1987, pp 11-13.  
No.4, 1987, pp 6-7.

□ 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.

3. June 4—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.

You will find articles concerning all these matters in the last three or four issues of Acid News as well as in the AIRPLAN Bulletin. We can also provide the critical-loads report, back numbers of Acid News, and other background material. Just write to us. Please inform us, too, of the activities you are planning. Ten days before Acid Rain Week we shall be circulating a report about events taking place throughout the world, which you then could use for your press work. Before and during the week you can also phone us and we will provide you with the most up-to-date information. A detailed report of all the activities that have taken place will appear in the September issue of Acid News.

Hoping for another enthusiastic and successful action week!

Christer Ågren Reinhold Pape

## The Great Sulphur Polluters in Europe

Country	Ratio export/import	Import* (%)	Promised reductions**
United Kingdom	10.9	19	30 % by 1999
Italy	6.7	22	30 % by 1993
Spain	6.7	24	—
D.D.R.	5.9	32	30 % by 1993
Hungary	4.8	36	30 % by 1993
Czechoslovakia	4.1	42	30 % by 1993
U.S.S.R.	3.7	32	30 % by 1993
Belgium	3.5	53	50 % by 1995
Poland	2.9	42	—
F.R.G.	2.0	53	65 % by 1993
Denmark	1.8	69	50 % by 1995
Luxembourg	1.7	78	58 % by 1990
Ireland	1.4	69	—
France	1.3	60	50 % by 1990
Netherlands	1.2	74	50 % by 1995
Finland	0.7	74	50 % by 1993
Austria	0.6	81	70 % by 1995
Sweden	0.4	84	68 % by 1995
Switzerland	0.4	89	57 % by 1995
Norway	0.2	93	50 % by 1994

Figures based on EMEP's sulphur budget for Europe for 1984.

\* The import figures show the percentage of the sulphur deposition not originating in the country itself.

\*\* Reductions are from emissions in 1980.

See also: Acid News No.3, 1987, p 5, pp 8-10.

### Note on critical loads

In the report entitled Critical loads for nitrogen and sulphur, "critical load" is defined as "the highest load that will not cause chemical changes leading to long-term harmful effects on the most sensitive ecological systems."

As regards the acidifying effects of airborne pollutants, the critical load for most soils in Scandinavia, as well as for many types of soil in central Europe, is 10-20 kiloequivalents of hydrogen ions per square kilometre per year. This figure corresponds to an annual sulphur deposition of 2-4 kilograms per hectare per year. This should be compared with the present deposition of 20-30 kg S/ha/yr in southwestern Scandinavia and an average of approximately 40-50 kg in central Europe.

The critical load for nitrogen is in the range 10-20 kg/ha/yr for most forest ecosystems, but for the most sensitive low-productive soils it is as low as 5 kg. At present the depositions of nitrogen over large areas of central

Europe amount to 30-40 kg.

On the basis of these data, and of available data on the concentrations of gaseous air pollutants that are critical for tree damage, the European environmental organizations have agreed on targets for the reduction of emissions that will be needed in Europe, as follows:

- A 90-per-cent reduction of the emissions of sulphur dioxide.
- At least a 75-per-cent reduction of those of nitrogen oxides.
- Furthermore, European-wide ozone formation needs to be reduced by 75 per cent, which is to be attained through the above reduction of NO<sub>x</sub>, combined with a reduction of the emissions of hydrocarbons.
- And finally, in areas of intensive livestock breeding, a reduction is needed of ammonia production by 75 per cent, in order to bring about a sufficient reduction of nitrogen deposition.

See also: Acid News No.3-4, 1986, pp 6-11. No.4, 1987, pp 4-5.

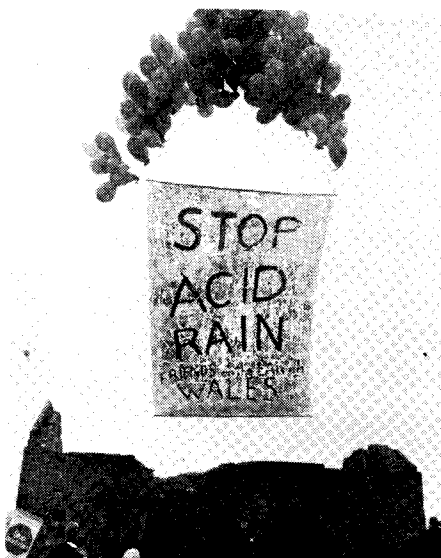


Photo: Richard Baker ©. At Aberthaw power station, Wales.

# Disturbing London's peace

After it had been officially admitted, just before Christmas, that emissions of sulphur dioxide had increased in the United Kingdom, the Norwegian Natur og Ungdom organization caused an uproar in London by "occupying" the big Christmas tree in Trafalgar Square that has been Norway's gift to Britain every year, almost since the war.

Two young women members of the NU took their chance one quiet afternoon early in December to jump over the railing and climb the closely branched tree. To the accompaniment of loud protests from the security guards they tied themselves to the trunk and unfurled a banner with the words "Stop acid rain."

On the ground journalists and passers-by were told why young Norwegians had come to England to save the environment in Norway. "Every year Norway



*gives Britain a Christmas tree. In return thousands of tons of acidifying pollutants come raining down on us,"* explained the NU leader.

Marianne Gjrv. "If Britain doesn't soon curb its emissions, this tradition will come to an end, for the simple reason that Norway will have no more trees to send you."

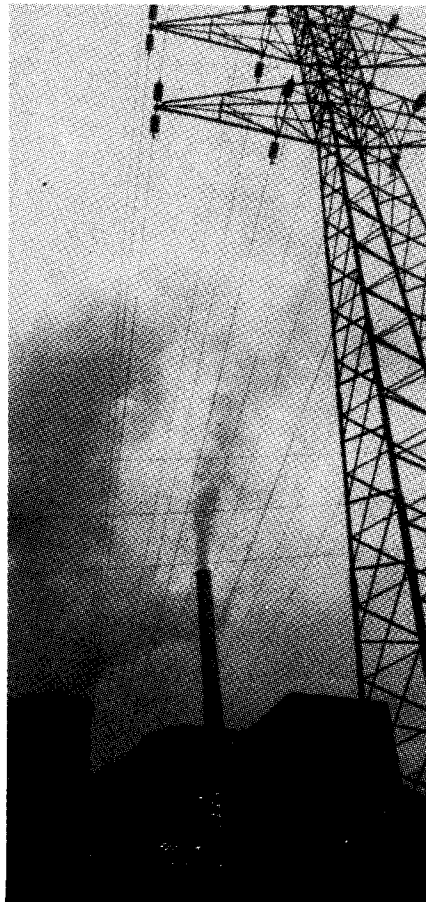
Attempts to persuade the young women to give up having been made in vain, after two hours a fire engine arrived and with the aid of its ladder the two were brought down in handcuffs. "Don't imagine only Norway is plagued by acid rain," said one of the firemen to them, in a Scots accent, "We get it in Scotland too."

After being held overnight in a London prison, the girls were brought before the Bow Street magistrate and fined 150 pounds each for "disturbing the peace."

Marianne Gjrv  
Natur og Ungdom

## Spanish polluter taken to court

The environmental group "Alternativa Verda" in Catalunya, Spain, has been protesting for many years against the coal-fired power plant (FESCA) at Cercs, to the north of Barcelona. The 170 MW plant which started to operate in 1971, emits 5,000 tons of SO<sub>2</sub> monthly without any attempt at desulphurization, and the environmentalists claim that this has seriously affected a large area of the Alta Bergueda forests. A study made by ecologists from the University of Barcelona, which is supported by scientists all over Spain, speaks of 30,000 hectares of damaged pine-forest. In September 1981 local farmers lodged a complaint at the local court in Berga, near Cercs, against FESCA on account of cattle that had died during the preceding months from eating contaminated grass. On the basis of the scientific reports, the local court in August 1985 found against the manager of the power plant



and ordered a guarantee of 800,000 US dollars to be deposited by FESCA.

In the meantime the Spanish government had authorized FESCA to increase emissions of SO<sub>2</sub> from 9,000 mg/m<sup>3</sup> to 12,500 mg/m<sup>3</sup> at the Cercs power plant when burning coal with more than 1.5 per cent of sulphur. Alternativa Verda is claiming that this authorization is not legal. According to Spanish law this is an ecological offence and the Alternativa Verda accusation is based on this legal definition. The case has now gone to the Barcelona court, and Alternativa Verda is asking environmental groups all over Europe to write letters of protest to the Spanish government.

Letters should be addressed to Sr. Victor Perez Pita, Director General de la Energia, Ministerio de Industria y Energia, Paseo de la Castellana, E-28071 Madrid, with a copy to Alternativa Verda, Carrer de la Lluna 24 bx. i ent. 2a, E-08001 Barcelona, Catalunya, Spain.

Reinhold Pape