No 4, Oktober 1984

Acid News

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

Swedish plan of action

Proposes 65-per-cent reduction of sulphur emissions

A 65-per-cent reduction of sulphur emissions, and 30 per cent for nitrogen oxides, by 1995, calculated from 1980, the base year. These are the highlights of a plan of action presented to the Minister of Agriculture by the Swedish Environment Protection Board in cooperation with six other governmental agencies.

The final cost of the proposed measures is put at SEK 1 billion, of which some 600 million will be the sum required for obtaining cleaner emissions from petrol-driven vehicles.

→

The Stop Acid Rain Campaign/Norway
c/o The Norwegian Society for Conservation of Nature
Box 8268, Hammersborg N- OSLO 1 NORWAY
Phone: + 47 - 2 - 42 95 00

The Swedish NGO Secretariat on Acid Rain
c/o The Swedish Society for the Conservation of Nature
Box 6400 S- 113 82 STOCKHOLM SWEDEN
Phone : +46- 8- 15 15 50

Acid News

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

ACID NEWS is a newsletter produced jointly by the Swedish and Norwegian secretariats on acid rain. The secretariats' and the newsletter's main task is to provide environmental and nature conservation organisations and others with information on the subject of acid rain and acidification of the environment.

Anyone who is interested in these problems is invited to contact the secretariats on the address below. Any questions or requests for material will be dealt with to the best of our ability.

In order to make Acid News interesting, we are dependent on information on what is happening elsewhere in the world. So if You read or find out about something which might be of general interest, please send a letter or a copy to us.

Address:
The Swedish NGO Secretariat on Acid Rain
c/o The Swedish Society for the Conservation of Nature (SNF)
Box 6400
S-113 82 STOCKHOLM SWEDEN

Telephone: 08-15 15 50

Editor: Christer Ågren
Published by: The Swedish Society for the Conservation of Nature
Printed by: Williamssons Offset, Solna

THE SECRETARIATS

The Norwegian secretariat, "The Stop Acid Rain Campaign/Norway", is organized by six non-governmental organisations 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)

Address:
The Stop Acid Rain Campaign/Norway
P.O. Box 8268, Hammersborg
N-OSLO 1 NORWAY

Telephone: 02-42 95 00

"The Swedish NGO Secretariat and Acid Rain" is organized by four nongovernmental organisations concerned with the environment:

- The Environmental Federation (Miljöförbundet)
- The Swedish Angler's National Association (Fritidsfiskarna)
- 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!

ISSN 0281-5087

→ Swedish plan of action

Early this year the Minister of Agriculture appointed a special action group to consider means of reducing acidification and damage to the forests. Its terms of reference were to examine the various causes of environmental pollution and to propose countermeasures.

Coordinator of the project is the Swedish Environment Protection Board, working in collaboration with the national boards for agriculture, fisheries, forestry, industry, energy, and social security.

If adopted, the group's proposals will, according to Valfrid Paulsson, head of the Environment Protection Board, put Sweden internationally well to the fore. The result will be a diminishment of the problems of acidification and cleaner air for the populated areas of Sweden, as well as a decrease in the export of airborne pollutants to neighbouring countries. The further research that is proposed will moreover provide a basis for additional measures later on.

Valfrid Paulsson does however also point out that as regards the effects of acidification such as forest damage, Sweden is very much at the mercy of other countries.

S-content in fuel oil

In Sweden itself, several steps have in fact already been taken to reduce emissions of sulphur dioxide. For heavy fuel oil the highest permitted sulphur content is today 1 per cent (corresponding to 0.24 grams of sulphur per megajoule of fuel), and that for light fuel oil 0.3 per cent.

Control of SO_2-emissions

This spring the Riksdag also voted a tightening of the regulation limiting the emission of sulphur dioxide from coal-fired furnaces. For large plants with an annual emission of sulphur exceeding 400 tons the permitted range will be 0.05 to 0.10 grams S/MJ (sulphur per megajoule). This corresponds to about 250-550 milligrams of SO_2/m^3. For smaller plants the range is 0.10-0.17 grams S/MJ, or 550-900 milligrams of SO_2 per cubic metre of waste gas.

By way of comparison it may be mentioned that according to the European Commission's proposal for a new EEC draft directive, the maximum permitted emission would be 400 mg SO_2/m^3 in the case of coal-fired plants with an output of 300 MW (thermic) and 2000 mg SO_2/m^3 for smaller ones. It is intended that this should become normative in 1985.

Drastic reductions

The measures already implemented in Sweden have, in combination with energy conservation efforts and changeovers to other than fossil fuels, resulted in a reduction of sulphur dioxide emissions from some 925,000 tons in 1970 to about 300,000 tons last year. Measures that have now been decided upon but have not yet come into force, together with others proposed by the action group, would further reduce such emissions from about 500,000 tons in 1980 (the base year) to 180,000 in 1985.

The group also proposes that certain additional ways and means of reducing sulphur emissions should be investigated, such as whether it would be possible to impose a further limitation on the sulphur content both of light and heavy fuel oils.

Control of NO_x-emissions

During the seventies Swedish emissions of nitrogen oxides increased slightly, rising from about 302,000 tons (in terms of NO_2) in 1970 to 317,000 in 1980. The action group's proposals for achieving a reduction of 30 per cent by 1995 include:

— From 1987 onwards all new petrol-driven vehicles to be made to run on unleaded fuel and to be equipped with catalytic converters (that is, to USA-83 stan-

dards). For heavy-duty diesel-driven vehicles USA-83 standards would be imposed a year later.

This would reduce emissions of hydrocarbons and carbon monoxide as well as of nitrogen oxides.

— Reduced emissions from industrial plants through the application of modern combustion technology (using either low NO_x burners or fluidized-bed combustion) or through denitrification of the flue gases.

Investigations will also be made into the possibilities of shifting some of the freight now carried by heavy-duty trucks with diesel engines to the railways, and of applying California standards for heavy vehicles in Sweden.

Reduced sulphur deposition

The proposed measures, together with those that are expected to be taken in other European countries, are calculated to have reduced sulphur depositions over Sweden by 30-40 per cent in the mid-90s. The acidity of the precipitation would be lowered by 0.3-0.5 pH units. In other words, the average pH value of the rain over southern Sweden would rise from about 4.2 as at present to about 4.6.

Liming and research

Among the group's other proposed measures are:

— The appropriation for the liming of lakes and watercourses, which this year amounts SEK 70 million, should be successively raised by 20 million a year for each of the next three years. So far more than 3000 lakes have been limed, but it will be necessary to continue liming for a very long time.

— A total of SEK 30 million should be allocated in the State budget for the protection of groundwater supplies by liming and other means.

— A further 30 million kronor should be made available for researching forest damage and groundwater acidification over a three-year period. This should include the working out of a scheme for monitoring the effects of acidification on health by the Board of Social Security.

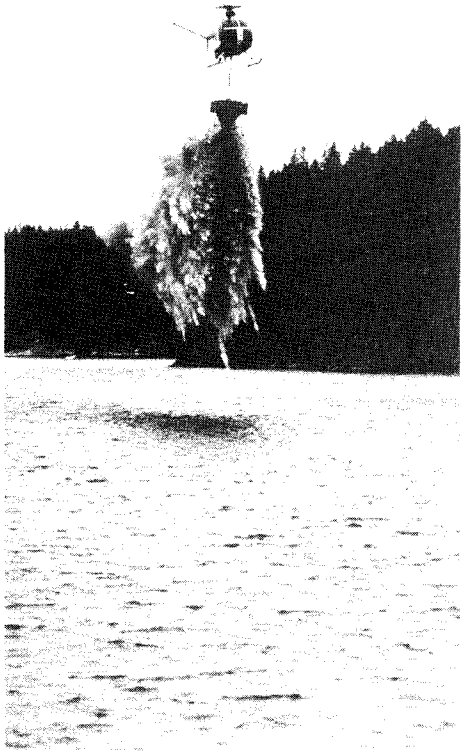


Photo: Christer Ågren

Minister is optimistic

The proposed plan of action will form the basis of a government bill that is being drafted in the Ministry of Agriculture and will probably be put before the Riksdag already this year. The Minister himself is optimistic as to the outcome, being of the opinion that there is a large degree of unanimity on these matters among the members of the Riksdag, and that strong popular support can also be counted upon. It should therefore be possible, in Svante Lundkvist's view, to gain wide political approval for measures aimed at counteracting acidification and pollution of the atmosphere.

International cooperation

Sweden has in any case long been active internationally in this respect, having been heavily involved for instance in the Scandinavian proposal for a reduction of at least 30 per cent in sulphur emissions by 1993. Following the Munich conference in June, sixteen nations agreed to adhere to this program and thereby join the so-called 30-per-cent club.

Thirty per cent not enough

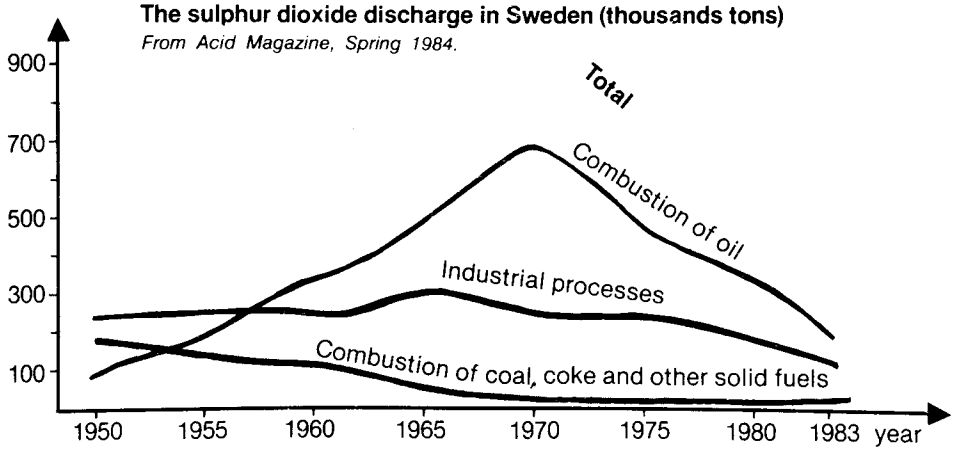
Again to quote Minister Lundkvist: *"Although a 30-per-cent reduction will not suffice to check acidification, it is at least a step in the right direction. We in Sweden have declared publicly that we intend to go considerably further. It is clear, as regards the observed damage to the forests, that sulphur pollutants are not the only delinquents. Research both in Sweden and abroad has shown that emissions from motor vehicles also bear a good share of responsibility."*

"We must therefore have lead-free petrol and cleaned exhaust emissions as quickly as possible. We must also, as in the case of sulphur pollutants, engage the cooperation of other countries in this matter. The meeting of experts on exhaust emissions that we arranged in Stockholm on August 24 may be seen as a part of such striving."

Christer Ågren

The sulphur dioxide discharge in Sweden (thousands tons)

From Acid Magazine, Spring 1984.



EIGHTEEN NATIONS Pledge Action on Acid Rain

Report from the Munich Multilateral Conference on the Environment, June 24-27, 1984

In an unprecedented East-West accord, 18 nations pledged to cut their sulphur dioxide emissions by 30% by 1993. Thirteen Western nations will cut 30% of all emissions based on 1980 data while the Eastern nations, headed by the Soviet Union, will cut their sulphur dioxide emissions carried to other countries.

Ministers and officials from 32 countries met in Munich from 24 to 27 June to work out ways of fighting air pollution, a cause of acid rain that damages forests, water resources, buildings and even human health.

This was a complicated conference, bringing together a number of different political objectives. The Conference was hosted by the Federal Republic of Germany — a country that leads the way in interpreting what the damages from acid rain to its forests, waters and structures mean to its economy. In particular, the German forest damage, now assessed at 34% of total forest area, is seen as a dark omen for forests in Britain and Scandinavia.

The political momentum was provided by the ten nations already committed to 30% reductions at the Ottawa meeting in March. Canada, West Germany, France, Sweden, Norway, Denmark, Finland, the Netherlands, Austria and Switzerland, have substantial documentation on the effects of acid rain. Their political commitment to action has been spurred on by active public policy debate prompted by concerned citizens. Belgium, Luxembourg and Liechtenstein announced at Munich that they would join the 30-per-centers.

The anxiety being felt in the eastern countries of Europe was expressed in the statements of the German Democratic Republic, the U.S.S.R., Bulgaria, and the two Soviet republics of Byelorussia and the Ukraine. All five have committed themselves to a 30 per cent reduction in the export of their SO_2 to other states — a significant contribution which will assist in reducing the amount of SO_2 in the air above the vulnerable lakes and forests which stretch from Northern Scotland to Moscow.

There were significant holdouts. Five countries contribute 75 per cent of Western Europe's SO_2 emissions: the U.K. emits 4.2 million tons, West Germany 3.5, Italy 3.1, France 2.9, and Spain 2. Only France and West Germany are 30% members. The others — the U.K., Italy and Spain — did not endorse the 30% call. Of the Eastern countries, Czechoslovakia, Poland, Hungary and Rumania are all large SO_2 emitters now admitting to evidence of effects yet reluctant to make a commitment.

The United States, which has not endorsed the 30% reduction, said that not enough is known about the effects of long-range transboundary air pollution. U.S. delegation leader William Ruckelshaus said that the 93 million dollars spent on acid deposition research since 1980 has not provided the answers. U.S. President Reagan has asked the Congress for 55 million dollars for next year. Mr Ruckelshaus promised that when the fundamental uncertainties were reduced, the U.S. would develop an appropriate set of measures to adress acid rain in North America. "Obviously we must work closely with our friends in Canada..." he said.

At this multilateral conference on the environment, the Eastern bloc made a strong attempt to insert a clause on the need to stop the arms race in the final communique and the resolution. Most Western countries argued that an environment conference was not the appropriate forum in which to dicuss the arms race. A compromise was achieved in recognizing that international cooperation in environmental protection contributes to the strengthening of peace and security in Europe and the world and that this is a decisive factor in the conservation of the environment.

The Conference's final resolution sets the stage for maintaining pressure on those parties to the Convention, notably the United States and the United Kingdom, who have not yet been willing or able to make a commitment to reduce sulphur emissions. While the U.K. did not join the Ottawa group committed to 30% reductions, it did endorse the resolution calling for a binding agreement for action by signatories to the Convention. The U.S., however, inserted a clause into the resolution stating that no additional U.S. action is possible.

From "Acid Rain The Politics of Downwind"
Produced for Environment Canada by The National Survival Institute, Canada.

Czechoslovakia: Pollution ten times world average

Czechoslovakia is firmly in the category of those nations present at Munich which stand to gain some benefit from present multilateral action to cut levels of air pollutants but which decline the open invitation to join the 30% group.

Leader of the Czech delegation, Mr Karel Nutil, commended the Federal German hosts on their selection of the topic under deliberation — *"The most urgent subject of our time"*, he said. The protection of forests and aquatic life through control of sulphur deposition is top of Mr. Nutil's priorities.

However, on a per capita basis, the Czechs, along with Hungary, Poland, Rumania and the German Democratic Republic, produce significantly larger amounts of SO_2 than most West European countries, and their spill-over pollution has damaging effects on West German forests and Scandinavian lakes. Mr. Nutil claimed that Czechoslovakia has no control over two thirds of the pollution deposited within its borders. Foreign sources, particularly in Western Europe, he says, are ultimately to blame.

The Czechoslovakia Academy of Science commissioned a study that says that pollution in Czechoslovakia is reaching the crisis point. Already 37% of Czech forests are either irreparably spoiled or dead. Pollution in the air and water is ten times the world average and if no action is taken, whole species of plants and animals will vanish, as will 60 per cent of forests, by the year 2000.

U.S.S.R. Exchanging one hazard for another

The Russian provided one of the surprises of the conference with a contribution described by some delegates as constructive and helpful.

The reason for this approach soon became apparent: the U.S.S.R. has been experiencing significant damage from air pollution. As well as deterioration in coniferous trees and large-scale damage to oaks, around 1.4 million tons of sulphuric acid a year are deposited on the arable land of the European U.S.S.R. In countering this, 1.5 million tons of lime are spread on the fields every year at an annual cost amounting to around 40 million roubles. Damage in crop losses is estimated at about three times this amount.

Although the U.S.S.R. is a large producer of sulphur compounds, wind currents over Europe dictate that it is actually a net importer of sulphur dioxide. In a move showing willingness to deal with what are essentially internal problems, the Soviet Union has decided to reduce its transborder exports of SO_2 by 30 per cent by 1993, and it will also reduce total emissions from vehicles by an equal amount over the same period.

The continued enthusiasm for large capital projects characteristic of Soviet development is revealed in their approach for achieving cuts in sulphur exports. About half the sulphur dioxide and 40 per cent of nitrogen oxides is produced during power production. A range of fuel-saving solutions are proposed but *"the development of nuclear power"* said Mr Israel, *"is the major way to replace fossil fuels"*.

In European U.S.S.R. this will mean the annual planned installation of blocks of nuclear power plants with a total generating capacity of 10,000 MW. Some delegates reacted by saying this was merely exchanging one hazard for another.

In addition to the U.S.S.R., the German Democratic Republic, Bulgaria and the two Soviet republics of Byelorussia and the Ukraine, all independent signatories to the ECE Convention, committed themselves to 30 per cent reductions in transboundary fluxes of SO_2 by 1993.

Poland: Damage to monuments and forests

Poland is very concerned by air pollution, and is suffering tree damage in over 1500 square miles of forest land. The Poles did not commit themselves to a desulphurization programme, however, using the excuse of their weak economy.

"The monuments of the historic city of Cracow bear witness to the damage we are suffering from acid rain and other industrial pollution", said Mr Zareba, the leader of the Polish delegation, *"and in 0.4 million hectares of forest land our trees are suffering as a result of this process. The damage occurs mainly in the Sudetan mountains, the Upper Silesian industrial area, and the region of Cracow."*

The Polish delegation linked its environmental policy to the economic disruption it has recently experienced with the Western nations. *"Poland has suffered economic losses amounting to 10 billion dollars as a result of Western economic restrictions,"* Mr Zareba alleged, *"and we have not been able to implement environmental controls as a result."*

Environmental scientists have warned that by 1990 as many as 3 million hectares of forest (11,000 square miles) may be lost if Poland proceeds with its present industrialization plans.

From "Acid Rain The Politics of Downwind"

Britain: SO_2 reductions "in a reasonable time scale"

The United Kingdom declined to join the movement of eight more countries who, in addition to the Ottawa Group of Ten, committed themselves to reductions of sulphur emissions by 30% by 1993 based on 1980 levels. *"We have difficulty with only one thing,"* said William Waldegrave, the U.K.'s Under-Secretary of State for the Environment, *"on top of the 20% reduction that we made before 1980 in SO_2 emissions, the immediate adoption of a binding commitment to a 30% drop by 1993." 1993."*

In emphasizing the Conference participants' general agreement that progress must be made on air pollution, the Minister outlined the fronts on which the U.K. could move. He promised further substantial SO_2 reduction in *"a reasonable time scale"*, parallel NO_x reductions and participation in the European-wide onslaught on pollutants from motor vehicles exhausts. He underlined the U.K.'s willingness to sanction more scientific work and monitoring within the ECE convention and its support for an international agreement for co-operative action.

This may represent new political interest in acid rain since, at present, only one-third of England is covered with monitoring stations. The systems do not cover 90% of Wales or any of Northern Ireland. As long ago as 1976, the Natural Environment Research Council told the Royal Commission on the Environment, *"Most government-sponsored (air monitoring) networks are based on obsolescent technology directed towards monitoring pollutants of concern to human health, and have little immediate relevance to rural Britain and effects on crops, trees, natural vegetation and soils".*

For the last 150 years, the U.K. has been the largest producer of airborne sulphur dioxide in western Europe, and it continues to be so. In Europe as a whole, its SO_2 production is second only to that of the European part of the U.S.S.R. which, unlike the U.K., is a net importer of SO_2 and has agreed to a 30% reduction of its transboundary fluxes.

The British claimed that their 20% reduction since 1980 in sulphur dioxide emissions was not primarily caused by the economic recession in the U.K., but is the result of a positive program of pollution control. The acid rain control campaign in the U.K., however, has pointed out that energy demand in the U.K. fell by 13% in the years 1979 to 1981, because of the drop in manufacturing activity. Mr Waldegrave commented on the connection. *"We accept that there has probably been a decrease of emissions because of the fall in industrial production. We regard this cleaner emission figure as something that we would like to hold on to, and are hoping to peg our emissions at this level".*

In dealing with nitrogen oxides, another pollutant contributing to acid rain, the British do not favour the use of tricatalytic converters. *"We are not satisfied with the efficiency and penalties in fuel consumption of this system,* he said, *"particularly when compared to the alternative offered by the use of fast-burn engines. The U.K. will be developing the fast-burn engine as its preferred option for reducing emissions of NO_x".*

Government officials in the U.K. are in favour of introducing unleaded petrol, but at a slightly later date than is currently being proposed by the West Germans. Mr Waldegrave maintained that there would be considerable difficulties in moving to unleaded petrol in early 1986. U.K. standards now allow for 0.4 g/l lead in petrol. EEC calls are for a move to unleaded fuel by 1991. But countries such as Germany, who believe that pollutants from vehicles threaten the environment and even human health, are moving more quickly to introduce unleaded gas. Germany will do so in January 1986.

Earlier at the Conference, the U.K. stated that they are not yet convinced that reduction of sulphur and nitrogen oxides will stop the damage currently being suffered by European lakes and forests, and want to look at the whole question of pollution control. *"We see no point",* a British official said, *"in making heroic efforts at great cost to control one out of many factors causing this pollution unless there is a reasonable expectation that such control will lead to real improvement in the environment".*

From "Acid Rain The Politics of Downwind"

Bicycle demonstration on the eve of the Munich Conference. Photo: Andrew Kerr

If they are serious... From words to deeds

Said at the International Conference of Ministers on Acid Rain, held in Canada, March 1984:

Charles Caccia, Minister of Environment, Canada.

"We are meeting in order to develop a common position to reaffirm our commitment and to indicate to the world that we are serious about the necessity of eliminating this poisonous process that is slowly but surely destroying the resources on which we depend. The inevitable question is, therefore, what will happen to us if we do not stop acid rain?"

Carl-Dieter Spranger, Federal Minister of the Interior, W. Germany.

"Stringent clean air policies are not only a logical consequence of ecologic but also of economic reason. Effective air pollution control will not only maintain and safeguard our natural basis of life but also the productive resources of our economy and thus also employment... In view of our responsibility towards future generations, the Government of the German Federal Republic gives top priority to environmental protection."

P. Winsemius, Minister of Housing, Planning and the Environment, Netherlands.

"We must do what is necessary. The Netherlands Government believes that we, being responsible as leaders of our generation, cannot pass on the problem of acidification to the next generation. It must be solved now, and it can be solved."

Rakel Surlien, Minister of Environment, Norway.

"We consider that a continuation of the dispersion of acid components, which irrefutably is causing damage to natural resources in other countries, is contrary to obligations under international law as these have been developed since the beginning of the nineteen seventies."

Svante Lundkvist, Minister of Agriculture, Sweden.

"Personally I am convinced, that the costs to our societies and our economies caused by the damage from acidification, however difficult they are to assess with precision, are much higher than the costs we shall have to pay for efficient emission controls."

It would be unfair to say that these statements were meaningless, since all the speakers had voted on behalf of their governments in favour of the well-publicized 30-per-cent reduction of SO_2 emissions by 1993. But if they are serious about saving our environment from disaster due to acid rain, that is not enough. Severe and steadily increasing damage is apparent almost everywhere, and the only way to deal with this global threat is to apply the best technical means we have for reducing emissions as soon as possible.

It has been said that application of the best available technology is too expensive but is nevertheless probably the best investment that any government could make today. According to all estimates the cost of damage far exceeds that of applying the best available technology. Adequate measures have, moreover, long been delayed, despite warnings over a period of several years from scientists and others. If those in authority really feel responsibility towards future generations and are prepared to take the consequences of their words, they no longer have any choice.

Greenpeace, which is politically and economically unattached, recognizes the urgency and makes the following demands on all governments:

- That the necessity be acknowledged for applying the best available technology as soon as possible in order to reduce emissions of sulphur and nitrogen oxides.
- That decisions for the implementation of the proposed measures be taken and the procedure for it made public before January 1, 1986.
- That such implementation be completed as soon as is technically feasible and begin with the major emitters.
- That emissions of nitrogen oxides from petrol-driven vehicles be reduced by making the equipment of catalytic converters mandatory, from January 1, 1986 for new vehicles and later, when technically possible, for old ones as well.
- That emissions from diesel-driven vehicles be recognized as a serious problem for which there is as yet no effective solution, and that research to find one be encouraged and funds made increasingly available.
- That public transport be promoted.
- That the overall energy policies be made to include more efficient uses of energy, and to look increasingly to alternative solutions, provided the alternatives are not such as to cause environmental damage of another kind — which would for instance preclude the consideration of nuclear power as an acceptable alternative.

We as an environmental organization are concerned about the ecological system on which our basis of life depends. We are however also concerned about the functioning of our society and its economy.

It depends on all of us, and especially on those who rule the world today, whether we can establish peace with our environment for the future.

A stop for acid rain would be a step along the way.

Göran Olenborg
Greenpeace

British Parliamentary Reports:
Start emission control now!

The acid rain debate in the UK has sharpened dramatically following the publication of two Parliamentary reports, and now looks set to become an embarrassment to the Conservative government when the issue is discussed in the House of Commons.

The House of Lords

The House of Lords Select Committee on the European Communities was asked to consider the impact of draft EEC legislation to combat acid rain, which meant looking at five proposals to cut sulphur dioxide (SO_2) and nitrogen oxides (NO_x) from industrial plants. The Lords expressed misgivings about many of the statements made by the EEC Commission on acid rain, and did not support the large-scale implementation of flue gas desulphurization, preferring instead the development of fluidized-bed combustion technology. On the other hand the Committee acknowledges that air pollution is a serious threat: *"The Committee considers that it would be foolish and dangerous for no action to be taken to combat the problems of air pollution. The magnitude of the damage resulting, the length of time over which this might become apparent, and its widespread effects if the fears expressed prove to be justified, make it necessary to implement a preventive programme now, despite the scientific uncertainties."*

Flue-gas desulphurization

So the Lords recommended that while fluidized-bed combustion technology was being developed, emissions from the UK's coal-fired power stations should be reduced by fitting *"not less than two power stations with flue gas desulphurization. This, according to the CEGB, would by the year 2000 have the effect of reducing the SO_2 emissions by 30 per cent from 1980 levels."*

The Lords report was initially received by the British environmental movement with disappointment, but it broke new ground by actually recommending a reduction in the U.K.'s output of SO_2 (even if its target dates were seven years too late). It also pointed to the embarrassing lack of scientific research in the UK into acid rain — the Central Electricity Generating Board in particular was (mildly) criticized for foot-dragging — and served as a curtain-raiser to a House of Commons paper published on September 6. This was a much more outspoken report, which has caused a good deal of discussion and publicity over acid rain.

The House of Commons

The House of Commons Environment Committee is comprised of seven Conservatives, three Labour members, and a Liberal. It has a wide-ranging brief and considers issues of importance to the environment. A few months ago it decided to look at acid rain, and set in motion a series of interviews, trips to Scandinavia and Germany, and discussions with British and European scientists. Sources inside the committee have told me that the Conservatives were initially sceptical, but rapidly became convinced when confronted with the evidence abroad. *"The Germans took us to a part of the Black Forest which was being left so that the foresters could observe the full cycle of tree deaths"*, said one MP, *"and it looked like a scene from World War I. We left the area very concerned indeed about the environmental consequences of acid rain."*

Inadequate information

The Committee was very well briefed before it started receiving representations from interested organizations, and was not in a mood to put up with some of the platitudes that were offered. The MPs were — to use their own word — "appalled" by the inadequate information being given to them, particularly from:

- **the CEGB** — the Committee noted that their grasp of the origins of ozone were extremely suspect. *"We are unsure whether this was the product of ignorance or a deliberate attempt to mislead us."* Elsewhere in the report the CEGB is criticised as being *"trite and evasive"*.
- **the Ministry of Agriculture** (its evidence was *"complacent and founded upon little other than conjecture"*.)
- **British motor manufacturers** (members were *"appalled ...at the standard of evidence received from motor car companies. They showed an almost total lack of awareness."*)
- **the Confederation of British Industry** (*"We are disturbed that the CBI's response to a serious debate on acid rain ...is to have done no work of any sophistication on costs to industry."*)

Lack of research

All in all, the MPs' conclusions supported what the UK acid rain campaign has been saying for some time — that the British complacency towards acid rain is based on lack of research into the problem. The MPs noted that nobody was compiling the effects of air pollution on historic monuments in Britain, and completed a mini-survey of its own, finding damage reported to Lincoln, Liverpool, and St Paul's Cathedrals, the Ministers at York and Beverley, Brompton Oratory, Westminster Abbey, and the Palace of Westminster — where Parliament sits. They also found evidence of fish losses in the U.K., and were concerned that the Forestry Commission was not adequately surveying British trees to monitor any damage.

→

Cathedrals' stonework rotting

In response to the House of Commons Environment Committee Report, published September 6, which highlights acid rain damage to eight major religious buildings, Friends of the Earth is alerting bishops to debate the problem in the House of Lords and organizing its local groups to mount a national campaign to save cathedrals by cleaning up power station emissions.

The report states: *"It is beyond doubt that acid rain, mainly due to SO_2 emissions, is damaging British buildings, and slowly but surely dissolving away our historic heritage".*

The committee heard evidence from the Building Research Establishment which noted that *"protection (at a cost of 5 pounds a square metre) rather than prevention is prohibitively expensive".*

Jonathon Porritt, FoE's national Director has written to bishops urging them to debate the matter in the House of Lords, and comments: *"We cannot cure the results of sulphur pollution so we must prevent it. This is the heart of the acid rain issue. The government would rather go on giving out money to patch things up, than introduce real environmental protection".*

The committee describes the destruction of *"important features of priceless buildings"* by sulphur air pollution as *"intolerable"* and vindicates Friends of the Earth appeals for the CEGB to reduce its power station emissions of sulphur dioxide by 60% (on 1980 levels by 1995) in the line with a draft EEC Directive.

Friends of the Earth Ltd
377 City Road, London EC1V 1NA, U.K.

About 5 million DM is being spent every year to replace stone damaged by erosion at Cologne Cathedral. Within five years none of the original stonework will remain, so the building will become a mere copy of the original. Photo: Christer Ågren.

→ Join the Club of Thirty

The Environment Committee recommends that Britain immediately join the Club of Thirty, which would involve a reduction of SO_2 emissions by 30 per cent between 1980 and 1993. It also supports the EEC draft directive on SO_2 reduction from large plants, which would achieve nearly a 40% reduction of total British SO_2 emissions by 1995. It did not like tri-catalytic converters (the system which the Germans are introducing to reduce NO_x emissions from cars) but favoured instead the development of fast-burn engines, which reduces NO_x emissions by increasing the amount of air mixed with the petrol before it is burnt. The Committee recommends a large increase in research into acid rain — but significantly, it stipulates research **in conjunction with** rather than **instead of** remedial measures to clean up our air pollution.

Vote-catcher

The British political parties are worried about being pre-empted on the environment, which is increasingly being perceived as a vote-catcher in Britain. The Labour Party has accepted the recommendations of the report, and the Liberals/SDP look set to follow. The Government will have to have a debate to discuss the Committee's findings, and with half the House — and a number of Conservatives — on the side of the angels, will feel the pressure to act. My feeling is that the U.K. will join the Club of Thirty within the next few months — certainly by the end of 1985 — with the announcement possibly being made before the House of Commons debate in November/December. This would not be an expensive commitment, as the U.K. has for reasons of the economic and industrial recession reduced its SO_2 emissions by 17% since 1980, and would have to achieve only a further 13% cut — this could be done by desulphurizing four or five power stations at an additional cost to electricity prices of 2-3 per cent over the next ten years.

Joining the Club of Thirty might be used by the U.K. as an excuse for torpedoing the draft EEC regulations, which are stricter and more expensive. In any case, the environmental movement will have to sort out its response to a move of this kind. If the U.K. joins the Club, its target for SO_2 emissions in 1993 will be 3,220,000 tons — and Britain will still be the largest emitter of SO_2 in western Europe.

Steve Elsworth

Acid Rain Blights U.K. Trees

In the first survey of its kind to be carried out in Britain, Friends of the Earth (Scotland) has uncovered new and startling evidence of acid rain damage to trees.

The worst hit areas are in the Lake District and the Forest of Dean near Avonmouth. Results show extensive forest damage. The Lake District receives some of the highest levels of acid deposition in the United Kingdom, but the area around the Forest of Dean has yet to be monitored. The nearest monitoring sites are 40 miles away.

FoE(Scotland) is now pushing for an immediate emergency tree survey to assess the full extent of damage.

Given the geographical spread of reported damage and that Swedish foresters finally observed effects last year only after being briefed by the German forest authority, FoE(Scotland) decided to call in expert opinion to test the accuracy of official British statements.

Joachim Puhe, a researcher with the University of Göttingen, acted as leader of the survey team. He was asked to follow a pre-selected route recording any evidence of tree damage which in Germany would be attributed to the effects of acid rain and air pollution.

The survey confined itself almost exclusively to England, visiting only one site north of the Border, near Jedburg.

Of the 47 sites surveyed, 31 exhibited symptoms of damage to conifers and hardwoods including:

— "tinsel syndrome" affecting spruce.

— discolouration of needles.

— needle loss, especially around the Whinlatter Pass in the Lake District.

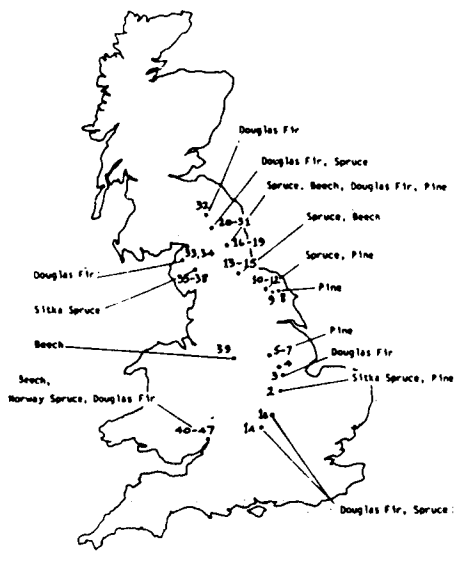


Figure 1. SURVEY SITES & SPECIES AFFECTED

— serrated edges of beech leaves, canopy loss, branch deformation and loss of leaves: observed in the Forest of Dean.

Some of the observations in Whinlatter were made outside the Forestry Commission Visitor Centre. Joachim Puhe commented: *"This is an area where we saw severe damage to Sitka Spruce... people in the Forestry Commission office said they knew that the trees weren't looking so good... some of them had thought about acid rain but they didn't know because they didn't have sufficient information."*

On the Forest of Dean: *"Nearly all the older beeches in the Forest and lots of Douglas Fir and Norway Spruce was looking quite badly damaged to severly damaged. I haven't seen such heavy beech damage in Germany."*

On the results of the survey in general: *"I have been working for three years on acid rain damage to trees. The symptoms we have seen in Germany, you have some of them here and there is no way to explain them all except by air pollution."*

Survey reports have been widely circulated and the photographic records made available to the House of Commons Environment Committee on Acid Rain.

FoE(Scotland) in condemning the lethargic response of the Forestry Commission is calling for an urgent and comprehensive tree survey to evaluate the extent of damage and potential loss of forest revenue. This must be conducted by experts familiar with air pollution damage.

Copies of the 12 page report are available from FoE(Scotland) Ltd, price 1.25 pounds including p&p.

53 George IV Bridge, Edinburgh EH1 1EJ, U.K.

Tinsel-syndrome on Norway spruce south of Kielder in the U.K. Photo: Alan Greig ↑

Tinsel-syndrome on Norway spruce west of Göttingen in the F.R.G. ↓

Maggie, please!

Signature campaign in Norway

— Eighty to ninety per cent of the atmospheric pollution in Scandinavia emanates from other European countries.

— Close to 90 per cent of the lakes and watercourses in South Norway have no fish left. By 1990 the fish may be lost in most of the rest too.

— Our forests are already affected by air pollution, and we fear that they may die, as in central Europe.

— Acidification leaches out heavy metals from the soil into our drinking water, which threatens to become poisonous.

In most of Europe there is a growing concern for the acid-rain problem, and counter-measures are being taken.

The exception is Great Britain.

Great Britain is alone among the big polluters in western Europe in not accepting the proposals for at least a 30 per cent reduction in sulphur emissions between 1980 and 1993.

We therefore request Great Britain to do so without delay. We cannot afford to wait while Great Britain delays measures for cleaning emissions.

Sign this protest to be sent to Prime Minister Margaret Tatcher.

The above is an abridgement of an appeal that is now being circulated in South Norway. The initiative has come from the Aust-Agder county division of The Norwegian Society for Conservation of Nature. The campaign which is envisaged as running until next summer has already attracted considerable attention. Even Kaare Willoch, the Prime Minister, has signed!

"Nine tenths of our lakes have died", says Stig Olsen, leader of Aust-Agder Society for Conservation of Nature. *"We fear that it is only a question of time before serious forest damage is also a fact. Meanwhile Great Britain wants to spend five years on research before reducing emissions. We fear the consequences of such delay"*, says Stig Olsen.

Svein Langvad

Cause and effect exhibited

Only a fifth of the deposition of sulphur pollutants over Sweden is from Swedish sources. The rest comes from abroad. And of all the other European nations the greatest sinner is the United Kingdom, contributing 10-15 per cent of total depositions. It was therefore logical to take the opportunity to place an exhibit at the big Game Fair at Romsey, Kent, England in July, in order to show the injurious effects of aerial pollution on the Swedish environment.

The exhibit was aimed at those organizations in Britain that correspond to the Swedish arrangers. The latter were: The Swedish NGO Secretariat on Acid Rain (which is operated by four organizations, see page 2), The Swedish Forestry Association and the Swedish Sportmens Association.

The reception was surprisingly favourable. Many of the visitors to the Fair expressed great indignation on learning of the volume of emissions from British smokestacks and of the damage it caused in Scandinavia. The hope is that the exhibit will have brought some increase of awareness in England of what is going on and so help to arouse opinion in favour of a reduction of atmospheric pollution.

Swedish exhibit at the Game Fair, Romsey, Kent, England. Photo: Christer Ågren

Finland: Acidification diagnosed

Now Finland has become publicly aware of acidification. The first extensive survey has shown that many of the lakes in the vicinity of the capital are approaching "acid death". Research has revealed, too, that trees are also being damaged in various ways by airborne pollution. It foretells in fact widespread death in the forests in the 1990s.

It may seem curious that hitherto there should have been no serious debate on acidification in "the land of thousands of lakes". Basically the Finnish ecological system in no way differs from that of the other Scandinavian countries, where serious signs of acidification had begun to appear some twenty years ago. The explanation probably lies in the fact that conservation has been far from highly rated as a political matter in Finland. This country was for instance one of the last in Europe to pass clean-air legislation, which it did in 1982. It still lacks the scientific basis for a true environmental policy.

Acidified lakes

The report on the state of some of the lakes has only just been presented. It concerns 107 lakes in the western part of Nyland province (to the west of Helsinki). The investigation made by Olai Helminen showed half of the lakes in that area — mostly small forest lakes — either to be suffering from severe acidification or to have such a low buffering capacity that they would become completely denuded of fish within a year. There are already lakes with a pH value under 4.5 that are without fish. The high concentrations of aluminium that have been found in the tributary streams also constitute a serious risk of poisoning for aquatic life.

Although the lakes in question lie to some extent downwind from large industrial and thermal power plants as well as population centres in Finland itself, the southwestern part of the country is obviously the recipient of a large amount of pollution from Europe, including Sweden. Recording also shows that pollution from the Leningrad area in Russia markedly affects southeastern Finland.

Effects on trees

Lately several Finnish scientists have been paying attention to the direct effects of atmospheric pollution on trees. Apart from some minor regional studies, there have as yet been no extensive field investigations. Research has instead taken the form of laboratory studies to determine the effects on the needles of conifers. Satu Huttinen of Oulu university has among other things investigated the effect of sulphur dioxide on the protective waxy covering of the needles as well as on the process of photosynthesis. She has demonstrated that atmospheric pollution stresses trees in various ways and that much of the damage to the forests can be attributed to the direct effect on the needles.

Forecasting trends

Studies have also been devoted to forecasting trends. At the University of Helsinki a group of scientists headed by Dr Pertti Hari has thus been examining the trends in regard to the amounts of sulphur dioxide, carbon monoxide, and nitrogen oxides in the atmosphere. The sensitivity of pine seedlings to various degrees of aerial pollution has also been studied, as well as the amount of nutrient substances in old and young needles. The field work centred on growths in areas of dry, poor soil in southern Finland.

The research has aimed at throwing light on two different kinds of effect: on the one hand the direct effects of atmospheric pollution on the trees' metabolism, on the other the indirect effects caused by changes in the environment such as altered amounts of nutrients in the soil and of aluminium in the soil and groundwater. The conclusion was that if the trends of the last few decades continue, there will be forest damage on a large scale. So far during the 20th century, the forests have been fertilized by airborne nitrogen; but around 1990 a reversal will occur, and they will be damaged instead of being fertilized by the pollutants.

Damage already visible

Considerable damage may already be seen in the southern and southwestern parts of the country. It is of course no mere coincidence that forest damage occurs precisely in those areas where the lakes have become acidified. Nor is it surprising that these areas should be those where the rain has the lowest pH value and the exposure to pollution from abroad is greatest. The process is inevitable, and another country has now been added to the list of those known to be suffering from the effects of airborne pollution.

Bo Landin

Buschhaus

Demonstration at Buschhaus power plant in April 1984. Photo: Christer Ågren

The government of West Germany was threatened with defeat over the 350-megawatt Buschhaus coal-fired power plant, near Hannover and the East German border. It was due to start up on August 1, burning local high-sulphur "salt coal" but without sulphur dioxide (SO_2) filters. It was expected to emit 100,000 ton of SO_2 a year, or 12,650 milligram of SO_2 per cubic metre of waste gas.

The crisis was settled with only minor concessions to the environmental lobby groups. It showed what a political bombshell West Germany's pollution problem has become and puts in question the government's promise to solve it.

The emissions of SO_2 from the plant are well over the limit of 400 mg/m^3 of waste gas set last year by interior minister Friedrich Zimmermann as part of a plan to cut the acid rain which has decimated West German forests. But the limit did not apply to Buschhaus or other "old" plants that were not planned with sulphur scrubbers in mind. These were given until 1988 to install the equipment.

In June, the Green Party launched a campaign to stop Buschhaus operating without scrubbers. The West German Liberals, junior partners in the ruling coalition, took up the campaign and, at the time, the government agreed with the measure.

But, in July, Chancellor Helmut Kohl's cabinet decided to let Buschhaus operate without SO_2 filters to protect what it said were 3,500 jobs connected with the plant.

The Liberals promptly said they would oppose the government on the issue, and Kohl called a first emergency session of parliament to save his coalition.

The Liberals agreed to a compromise. Buschhaus will burn "brown coal", with only 2 per cent sulphur, instead of the planned 3.5 per cent. The scrubbers will be installed in June 1987, six months earlier than planned.

Environmentalists complain there is no guarantee that the plant will not revert to burning salt coal, and argue that there is no provision for checking sulphur emissions. These deposits will land in East Germany, downwind from the plant's 300-metre smokestack. At the beginning of August, Greenpeace activists scaled the smokestack, and West Germans and East Germans tried to stop the plant with a court order.

There are still questions, however, as to whether the plant is needed. Lower Saxony, where Buschhaus is located, already has 700 MW of excess electrical capacity. Moreover, it now seems that only 400 jobs depend directly on it.

Buschhaus is run by BKB, a coal company in Braunschweig in which the government owns the majority of the shares. Three government officials from the ministries of finance, labour, and the economy sit on the board, as well as Hermann Schnipkoweit, the local official who gave Buschhaus its permit in 1978.

The cost of installing SO_2 scrubbers, which was to have been shared with the government, is estimated at 53 million pounds. But the German electric plants association estimates that equipping 37,000-MW worth of German coal-fired plants with scrubbers and shutting another 12,000-MW worth would cut SO_2 production by a quarter, and cost the German consumers 2 Pfennig (half penny) per kilowatt-hour.

That same kilowatt-hour now generates 5.5 g of atmospheric SO_2 at most plants, but 50 at Buschhaus.

From New Scientist, August 9, 1984

Acid Rain Developments in the U.S.A. and Canada

The United States

The acid rain issue is getting broad public exposure in the United States during this critical election year. In a series of speeches and visits to environmentally damaged areas, President Reagan sought in July to cut his losses among pro-environment voters by posing as a protector of the environment and by pointing to his enlarged budget for acid rain *research.*

More research

But this effort seems to have been quite transparent, especially since he nominated at the same time Ann Gorsuch Burford (the discredited former chief of the U.S. Environment Protection Agency who resigned under fire last year) to head a federal advisory panel on the environment. Both houses of Congress immediately passed resolutions urging that the Burford nomination be withdrawn, and Mrs Burford eventually withdrew her name to spare Reagan further embarrassment.

More revealing of the Reagan administration's acid rain policy was the stance of the U.S. delegates at the Munich acid rain conference at the end of June. Headed by EPA Administrator William Ruckelshaus — who reportedly has lobbied unsuccessfully within the Reagan cabinet for more aggressive acid rain abatement action — the U.S. delegation refused to join the "30-per-cent club", arguing that more research is needed before sulphur dioxide can be held to be the chief cause of acidification.

A household word

Meanwhile, at the Democratic Party's July convention in San Francisco, both the keynote speakers, Governor Mario Cuomo of New York, and Senator Gary Hart of Colorado, a former leading contender for the Democratic presidental nomination, spoke scathingly of the Reagan administration's indifference to acid rain. The most profound effect of these observations was to make "acid rain" a household word among the American people: More than 100 million Americans listened to the Cuomo and Hart speeches on the national television.

Environmentalists' report

U.S. environmentalists have been doing their part to fuel the public debate. In their recent joint report on acid rain in America's southern states, the U.S. National Clean Air Coalition and the Friends of the Earth Foundation observed that rainfall over much of the 13 southern states is 10 to 20 times more acidic than normal rainfall. *"No longer can the South afford to believe that acid rain is only a northeastern problem"*, the report said. Noting that researchers in one southern state, North Carolina, have found that red spruce at elevations above 2100 meters are losing up to 90 per cent of their needles, the report attributed the red spruce decline to acid rain. The report concluded by endorsing the U.S. National Academy of Sciences' call last year for a 50 per cent reduction in acid deposition.

New state laws

Also this summer, the state of New York has enacted a law requiring emissions from power plants and factories within the state to be reduced by 100,000 tons, or 12 per cent of statewide emissions, within four years. The law sets up administrative machinery aimed at 30 per cent reduction by the early 1990s. Similar legislation has been introduced in Massachusetts, and Minnesota acted two years ago to develop a statewide acid rain strategy.

The New York law is the first legislation in the United States requiring pollution reductions specifically designed to combat acid rain. It is one of the few bright spots in a nation whose federal air pollution control policies are either retrogressive or paralysed.

Canada

Across America's northern border, the Canadian government continues to offer leadership in the international acid rain abatement effort. Canada organized a useful, media-oriented international conference in Ottawa last March for members of the "30-per-cent club". This conference laid some of the groundwork for the June Munich Conference.

At the provincial level the Ontario legislature has been considering since May the *"Transboundary Pollution Reciprocal Access Act"* recommended by both the Canadian and American Uniform Law Conferences. The act would enable Ontario residents to sue for polluting damage when the pollution comes from across a provincial or international border. It would also extend equal access to Ontario courts for residents of other jurisdictions who are affected by pollution originating in Ontario.

"An embarrassment"

Canada's international reputation as a vigorous acid rain abater was tarnished somewhat in June when a Canadian parliamentary committee publicly termed Canada's acid rain control program *"an embarrassment"*. The committee chairman, Ronald Irwin, MP, charged that Canada has compromised its case against the United States by *"manipulating statistics to give the appearence of action"*. Irwin pointed out that Canada has twice the SO_2 emission *per capita* as does the United States, and permits three times as much NO_x emissions and five times as much hydrocarbon emission from motor vehicles, compared with U.S. motor vehicles emission standards. →

New publications

"ACID RAIN: IN THE U.K. AND EUROPE" (1984)

Steve Elsworth is a journalist who works as an environmental consultant to groups campaigning against acid rain. His book ACID RAIN: IN THE U.K. AND EUROPE was published by Pluto Press on September 6. It examines the spread of acidification, how it works, what its effects, and who produces it. There is a country-by-country analysis of pollution effects and national strategies to combat air pollution, and a chapter on the international politics involved.

ACID RAIN: IN THE U.K. AND EUROPE (154 pages) costs 3.95 pounds from Pluto Press, The Works, 105 A Torriano Ave., London, NW5 2RX, England.

"5 VOR 12"

An informationletter about forest death, air pollution control and energy policy. This information letter in German is published several times per year by C. Bosch, U. Fritsche and Hermann Graf Hatzfeldt. It can be ordered from Dieter Deumling, Postfach 135, 5248 Wissen/Sieg 2, F.R.G.

"ACID PRECIPITATION DIGEST"

A monthly bulletin on current research, events and news concerning acid rain, produced by the Acid Rain Information Clearinghouse. A one-year subscription costs 30 US dollars for non-profitorganizations and individuals (+ 15 US dollars for foreign postage), and can be ordered by pre-payment to: Acid Precipitation Digest, Center for Environmental Information, Inc., 33 South Washington Street, Rochester, New York 14608, U.S.A.

"ACID RAIN THE POLITICS OF DOWNWIND" (1984)

Produced for Environment Canada by the National Survival Institute. 12 pages. Report from the Munich Multilateral Conference on the Environment, June 24-27, 1984. Can be ordered from the National Survival Institute, 53 Queen Street, Suite 27, Ottawa, Canada, K1P 5C5

Acid Rain in the South: Its Impact and its Threat, National Clean Air Coalition (530 7th St. SE, Washington DC 20003) & Friends of the Earth Found., June 1984.

Analyzed nearly 150 studies and concluded that acid rain is a threat in 13 southern states, and that these states generate 28 per cent of the country's SO_2 emissions and about 67 per cent of their own acid deposition. Looks at the gamut of possible effects of acid rain and at deposition rates and acidities, and gives cost estimates for SO_2 control. (See Sierra Club Nat. News Rep., p. 2, June 18; Environ. Reporter, p. 251, June 15.)

Time Lost — A Demand for Action on Acid Rain, 65+ pp., Spring 1984. A report from Subcommittee on Acid Rain, House of Commons, Ottawa K1A 0A6, Canada.

Makes a number of recommendations, as a result of its latest 1-year study, such as: motor vehicle NO_x, hydrocarbon and carbon monoxide emission standards should be reduced for the 1986 model year; leaded gasoline should be banned by 1995; several financial incentives should be allowed for purchase and use of emission control equipment.

From Acid Precipitation Digest, August 1984

"DIE LAGE DES WALDES" (1984)

Meister et al. 352 pages. Published by GEO Verlag, Hamburg, F.R.G.

"BAUMLOS IN DIE ZUKUNFT?" (1984)

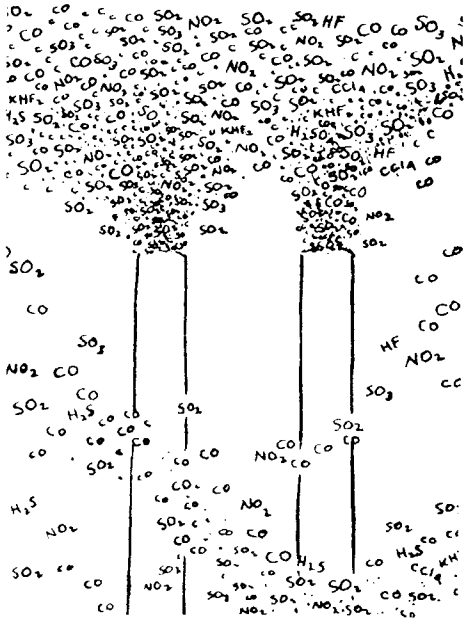
Guratzsch et al 272 pages. Published by Kindler Verlag GmbH, München, F.R.G.

Acid Rain Study

A new comprehensive and easily digestible study on acid rain

The **Worldwatch Institute** in the USA recently presented a new comprehensive study put together by its senior researcher, Sandra Postel. This study is divided into sections, and written in easily comprehensible popular-scientific language.

This study can be ordered from:
Worldwatch Institute
1776 Massachusetts Ave., NW
Washington D.C. 20036
USA.



→ The parliamentary report praised the U.S Tennessee Valley Authority which has spent 1 billion US dollars over the last two years on scrubbers for coal-burning power plants. By contrast, Ontario Hydro, Canada's largest public power company, talked about installing its first two scrubbers and then summarily cancelled plans to install them.

The Canadian environment minister, Charles Caccia, said he welcomed the parliamentary report despite the strong attack on the government. He said it would give impetus to a general move to clean up the air.

Armin Rosencranz
Inverness, California

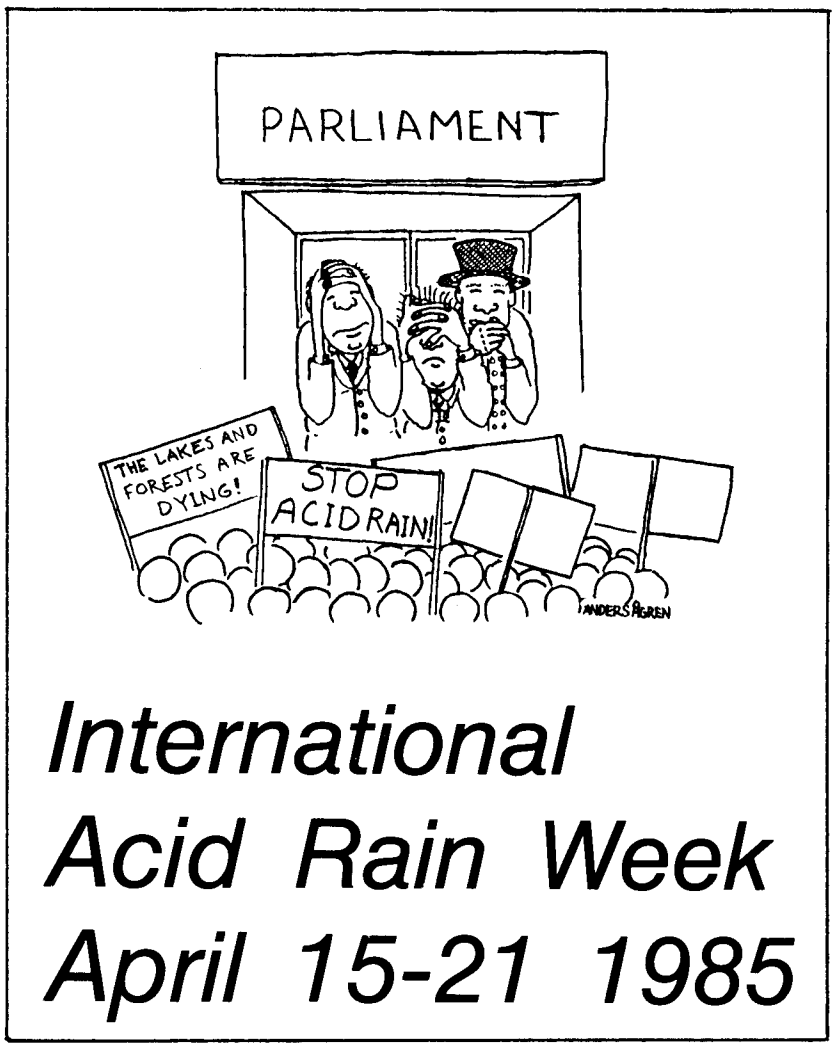
Top Ten

(Expanded version)

Promised reductions in SO_2 emissions, using 1980 as base year.

Sweden	**60%**	**to**	**1995**
France	**50%**		**1990**
F.R.G.	**50%**		**1993**
Canada	**50%**		**1994**
Norway	**50%**		**1994**
Denmark	**50%**		**1995**
Netherlands	**40%**		**1995**
Austria	**30%**		**1993**
Belgium	**30%**		**1993**
Finland	**30%**		**1993**
Italy	**30%**		**1993**
Liechtenstein	**30%**		**1993**
Luxembourg	**30%**		**1993**
Switzerland	**30%**		**1993**
Bulgaria	**30%** *		**1993**
Czechoslovakia	**30%** *		**1993**
G.D.R.	**30%** *		**1993**
U.S.S.R.	**30%** *		**1993**

* = **of exported SO_2**



International Acid Rain Week April 15-21 1985

Novel grounds for asylum

On August 2 six West Germans turned up at the Swedish Embassy at The Hague and asked to be granted asylum. They said the steady ravaging of the environment in their own country made them feel persecuted, and that they wanted to come to Sweden because it was especially badly affected by emissions of sulphur from the Federal Republic.

"We made up our minds when we heard that our government was going to allow the coal-fired power plant at Buschhaus to be started up despite its not having desulphurizing equipment", said Rüdger Prasse from Hamburg.

The six Germans had been attending the annual meeting of the International Youth Federation for Environmental Studies and Conservation, where the main subject of discussion had been acidification and forest death.

They said they had been well received by the embassy staff and had even met the ambassador, Carl-Henrik Nauckhoff. Embassy counsellor Göte Löthammar had to inform them however that although the Swedish government might take a sympathetic view of such forms of protest, asylum could not be granted solely on ecological grounds.

The Germans said they would like to come to Sweden all the same, adding that they had in fact been given help in filling in applications for permission to stay and take work in the country.

Commenting on the matter, Lise Blomkvist at the Swedish Immigration Board said: *"We have still not recieved their applications, but as far as we can see the circumstances are not such as would provide an acceptable reason for asylum. The law does not take cognizance of environmental claims."*