NO. 1, JAN 1984

Acid News

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

Very bad damaged stand of Norwegian spruce, suffering badly from loss of needles. From Harz. The most exposed trees are also the most dama ged.
Photo: Christer Ågren

International Acid Rain Week

April 2—8 1984

The devastating effects of air pollutants on our environment are becoming ever more obvious. We see now how forests are being affected also in Sweden, Holland and other countries. Acidified lakes and rivers have been discovered in central Europe and the United Kingdom. In India the Taj Mahal is at risk, in the USA the Statue of Liberty, in Greece the Acropolis and in Italy the Colosseum (to name only a few examples), owing to the corrosive force of pollution. Recent reports from China indicate ever-growing problems. For example, the number of smog days in Peking (Beijing) has doubled in a very short time from 100 to 200 per year. Several experts have expressed their anxiety that what we can next expect is an effect on the tropical rain forests. Unless it has already hit them...

→

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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.

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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)

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"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!

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International Acid Rain Week

Responsibility for the future

In Europe, North America and elsewhere in the world, politicians and decision-makers are slowly (unfortunately, all too slowly!) opening their eyes to the damage caused by air pollutants. International studies show that it is actually profitable from the overall national economic standpoint to invest in a reduction of emissions. In a large number of countries, the politicians stand at a crossroads. The choice they make will be decisive for the future: how are we to set about reducing our expensive dependence on oil? In some places, people incline towards the use of coal as a substitute fuel.

Far too few see the question from the important, long-term international perspective: have we the right, in the space of a couple of generations, to plunder the earth and deprive future generations of the earth's limited resources of fossil fuels; and, in addition, to leave behind us a badly polluted and damaged world for those who come afterwards?

Acid Rain Action

Against this background IYF (Europe) has proclaimed week 14, i.e. 2-8 April 1984, International Acid Rain Week. A special Action Day is scheduled for Saturday 7 April.

The goal

The goal is by a massive joint Action Week, arranged by the organizations interested in the environment, to create largescale publicity on the problems of acidification, and thereby directly and indirectly to influence the responsible (and indeed irresponsible) decision-makers drastically to reduce emissions of air pollutants. It is also important that we should be able to demonstrate that it is possible even now to achieve this — possible for each country to reduce its emissions at a far from insuperable cost.

The OECD, for example, has shown that a 50% reduction in Western Europe's discharges of sulphur dioxide over a ten year period would cost on average USdollars 12 per person p.a. In aggregate, this would raise the price of energy by on average 2.5—3.5%. (OECD: The Cost and Benefits of Sulphur Oxide Control, 1981.) It should be noted that this presupposes the application only of technical solutions, such as the desulphurization of fuel and flue gases etc. Should a strategy of this kind further incorporate techniques for effective combustion (e.g. fluidized bed combustion) and a thrust towards a more efficient use of energy, i.e. the reduction of today's enormous wastage of energy and resources, then emissions could be cut back far, far more. In this way, we would also show a greater responsibility for our successors, and for the Third World.

Opinion

Through the activities of the environment organizations (and here I include also organizations for forest-owners, fishermen, farmers etc.), we have to achieve an increased awareness on the part of the general public and decision-makers. Hopefully, an increased awareness that will create an increased opinion against emissions of air pollutants. A public opinion that will weigh heavily in the balance when the politicians take the decisions on future energy policy, and new rules restricting emissions.

An Utopia?

If the bulk of the organizations reached by Acid News really involve themselves in →

this Week (and preferably also for some time thereafter), hundreds of thousands, perhaps millions of people would be actively concerned in the issue of acidification that week. People who would all themselves learn a lot about the question. Additional millions of people would be informed on the subject via the mass media. Many of these people will be adopting a position for or against emissions depending on the information they get.

Your organization!

You and your organization are an important link in the chain. Don't break it!

How?

This International Acid Rain Week will not be subject to any sophisticated and coordinated central steering, by which we are required to do this or that. Each organization at its particular level, local, regional, or national, will decide what it should or should not do. Depending, naturally, on what it thinks it can cope with and handle. Activities can include anything, from for example writing letters to the local newspaper, arranging an internal or public lecture evening, setting up a public discussion, organizing demonstrations etc. to presenting a coherent national programme for the reduction of emissions within the country. All paths are open.

In our next issue of Acid News, which is scheduled to appear in mid-March, we shall be presenting further proposals for concrete activities.

Collaboration

The concept that "united we stand" often applies also to environment organizations. One suggestion is therefore that you should quickly make contact with organizations that may have similar interests, and initiate a collaboration.

A "postcard action"

IYF plans to get as many organizations as possible to carry out an internationally coordinated postcard action. By the organizations, for example, via their house journal, spreading printed postcards to their members, and these in their turn signing them and sending them out. It is proposed that each country should make four originals, one adressed to its own government, and the three others to the governments of the three nations responsible for the greatest export of sulphur to the country. In the case of Holland, for example, this would mean adressing post cards to Holland, West Germany, The UK and Belgium.

Naturally, this action will achieve a greater impact if one can also or instead persuade numerous private individuals to write and send personal letters demanding the reduction of emissions.

An original drawing and suggestions on the text can be ordered from the Swedish NGO Secretariat on Acid Rain.

Material

I should like to conclude this article by asking you, the reader, to note down on one or several sheets of paper detailed information on all the material on acidification available in your country. So you don't know everything? OK, write down what you know, and send it to the Swedish NGO Secretariat on Acid Rain. More exhaustive information on what sort of information we are looking for, and why, is contained in the Appeal in the separate panel. If we can get these facts quickly, i.e. preferably before 1 February, the Secretariat will collate the material in several country-by-country materials lists. These will be distributed with the next issue of Acid News.

Let's fight together for reduced emissions of air pollutants. Let's stop the acidification!

Christer Ågren

Acid Rain Action Day - Saturday 7 April

Appeal

Prior to International Acid Rain Week, the Swedish NGO Secretariat on Acid Rain plans to compile country-by-country lists of available material. We would ask you to note down everything you know on existing material relating to Acid Rain, and send it to the Swedish NGO Secretariat on Acid Rain, under the address printed on the front page of this publication.

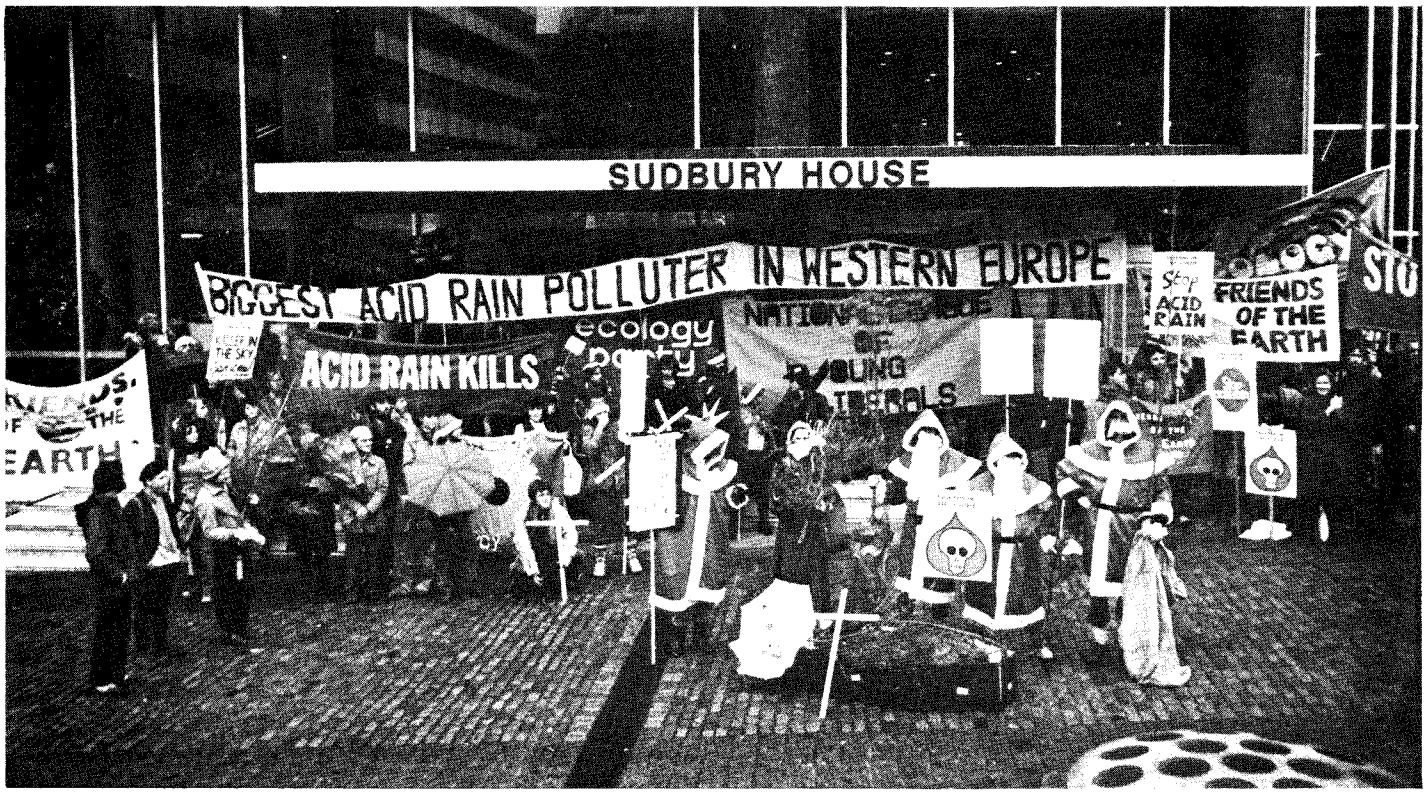
We would appreciate it if we could receive your list by at latest 1 February, which will permit us to send out a compiled version with Acid News No. 2/84; the organizations could then use them during Acid Rain Week.

Some examples of what we should like information about are given below:

- books
- brochures
- posters
- films
- videos
- filmstrips
- T-shirts
- stickers
- buttons
- test kits
- postcards
- umbrellas etc.

NB! Please make your information as detailed as possible, i.e. name, author, publisher, price, no. of pages/illustrations, size, where the material can be ordered from etc.

Action in London



Thursday, 15 December, was a red-letter day in the UK campaign against acid rain. Six environmental groups — the Ecology Party, Friends of the Earth Ltd, Friends of the Earth Scotland, Greenpeace, the Socialist Environment and Resources Association, and the Young Liberals — all pooled resources to mount the UK's first acid rain day of action. They set up a rolling programme of events, starting with the delivery of a list of organisations concerned about acid rain to the Department of the Environment, then moving to a demonstration outside the CEGB. After that, a press conference in Fleet St, two hours of free films, and a carol service in the evening.

The whole day was surrealist, but nothing more so than the demonstration outside the Central Electricity Generating Board's (CEGB) offices. Six Santa Clauses, forty dead trees, a coffin, a three-piece marching band, banners, placards, seventy protesters, and a covey of blue suits from the CEGB handing out specially-printed press releases to try to counter the bad publicity.

The three London radio stations all carried news of the demo, two of them broadcasting details of the films, carols, protests, and press conferences throughout the day. The day of action's message: **'The CEGB bears a direct responsibility for the production of acid rain: it is time to clean the emissions from our power stations'** was stated outside the Department of Environment offices, outside the CEGB, in the cinema of the Institute of Contemporary Arts, at a press conference in Fleet St, in a carol service in Trafalgar Square, and through a million transistor radios. The day was perfected for me by a photograph taken of all the protesters with their banners, standing outside the CEGB office. Underneath the sign 'Sudbury House', next to a sign saying 'Central Electricity Generating Board' was an enormous banner reading **WORST ACID RAIN POLLUTER IN WESTERN EUROPE**. It was a public relations nightmare...

Anyway, back to reality, as the six environmental groups concerned take breath for the next assault. The CEGB is keeping its head down at the moment, hoping that things will quieten if it doesn't make too much noise. But there's more bad news: all six environmental organisations have pledged themselves to make 1984 the year of acid rain in the UK. Thursday December 15 was just the beginning...

Steve Elsworth

Stop Acid Rain Thursday

December 15 1983

Opening press statement by Steve Elsworth:

Acid rain has been called 'the most important environmental threat currently facing Europe', 'an ecological catastrophe', and 'a particularly modern, post-industrial form of ruination'. It has become a subject of pressing public concern in Canada, Sweden, Norway, West Germany and the Netherlands. Millions of pounds have been spent annually on research into the subject and at least three international organisations — the OECD, the United Nations Economic Commission for Europe and the EEC — have expressed anxiety over the growing acidification of Europe. Yet in Britain — up to now — there has been little public interest.

The purpose of **Stop Acid Rain Thursday** is to launch a major UK offensive against acid rain. The six organisations that you see represented at this table — the Ecology Party, Friends of the Earth Ltd, Friends of the Earth (Scotland), Greenpeace, the Socialist Environment and Resources Association and the Young Liberals — have all pledged to make acid rain a target for large-scale campaigning in 1984. Next year, as far as the groups here are concerned, is the year of acid rain.

Britain has a particular responsibility for the continued acidification of Europe. Of all the West European countries, the UK is the largest and most unrepentant producer of airborne Sulphur Dioxide, pumping out over four million tons of SO_2 every year. This is the equivalent of 66.000 30-ton lorries full of sulphur, up-ended over the ecosystems of Britain and Europe every twelve months. This pollution joins that from other countries and the result is dead lakes, dying forests, corroding buildings and sick people. It is time for Europe to reduce its emissions of sulphur into the air and Britain, as a leading contributor of SO_2 pollution, should announce a major desulphurisation programme now.

The groups campaigning against acid rain will also be demanding a reduction in emissions of nitrogen oxides. These also acidify the environment and help the formation of ozone which has a destructive effect on trees and vegetation. In the UK the Central Electricity Generating Board (CEGB) is the largest producer of both Sulphur Dioxide and Oxides of Nitrogen, belching out 60% of our SO_2 and 40% of our NO_X. For that reason, the CEGB is the main target for the UK acid rain campaign. The Board is ignoring its statutory duty to protect the environment, contributes more to Europe's acidification than any other organisation in Western Europe and is responsible for the production of more airborne SO_2 and NO_X than many European countries. It is time for the CEGB to realise that air pollution is no longer an acceptable form of industrial waste disposal.

The UK Government also bears a direct responsibility for acid rain. At a meeting earlier this year, the Treasury vetoed a Department of the Environment proposal for a 30% reduction in SO_2-emissions on the grounds of cost. The programme would have added 4% to domestic electricity bills — a rise which the Cabinet is prepared to entertain in other circumstances, but not in order to protect the environment. In March 1983 Mrs Thatcher signed a statement at the EEC Council of Ministers' meeting saying that *"the damage done to the forestry environment by acid rain makes effective joint action urgently necessary"*. The words we would like to draw attention to are *"effective"* and *"action"*.

Stop Acid Rain Thursday is calling for an end to pollution caused by acid rain and requires governments to take all steps necessary for this end. In the short term it wants the UK to reduce its SO_2 emissions by half in the next ten years — an achievable target. The EEC is publishing a draft directive on national SO_2-emissions which will call for similar reductions by the year 1995.

At the Department of the Environment this morning the organisers of START delivered a list of 35 organisations who have expressed concern over acid rain. After our protest outside the CEGB and the press conference we will be showing films about acid rain at the ICA from 12 noon to 2 pm: and this evening there will be a special carol service in Trafalgar Square at 7 pm. This day of action is the first in a campaign which will run and run if it has to, until the UK's reputation as the bad neighbour of Europe, the smelliest country in the West, comes to an end.

A report sounds the alarm: 34% of West German forest land damaged!

New and alarming figures on the extent of damage to forest land were recently presented in an official report from West Germany. A nationwide inventory was performed in the summer of 83, and the result shows that 34.4% of West Germany's aggregate forest land has been damaged by air pollution. Hardest hit is the silver fir; 76% of the stock is damaged, and this species is now regarded as threatened with extinction in Germany. Spruce, pine, beech and several other species have also suffered extensive damage.

The report states that the first symptoms of disease were discovered in silver fir *(Abies alba)* in the early 70s. Damage to Norway spruce *(Picea abies)* was then reported in the late 70s. Immediately after which, in the early 80s, new and alarming reports were published indicating that also pine *(Pinus silvestris)*, beech *(Fagus sylvatica)* and to some extent even other species such as oak, red oak, maple, ash and rowan had been hit. The new report, which presents the results of a careful inventory performed in the summer of 83, shows that the damage has continued to increase.

Causes

Experts in West Germany agree that the damage to forest land is caused by an interplay of several factors. The primary underlying cause is considered to be air pollutants, above all sulphur dioxide, heavy metals, nitrogen oxides and photo oxidants. To these can be added secondary factors such as frost, drought, injurious insects and fungi. The influence of different factors can vary locally. But it is established that the damage now evident in the forests would never have occured at all without the injurious effect of air pollutants.

Damage: the symptoms

The symptoms of disease displayed by damaged conifers are above all yellowing needles, loss of needles, distorted branches, thinning tops, bark injuries, trunk changes, and damage to the fine root fibres. These symptoms appear with varying intensity, and in various combinations. They often appear together with secondary effects, such as attacks by insects and fungi, and an impaired resistance to frost. In the case of deciduous trees, the main symptoms evident are discoloured and deformed leaves, early shedding of leaves, the death of part of the top, bark injuries, and a lack of natural rejuvenation. Generally speaking the damage hits all age categories, including younger trees and seedlings.

Damage: the extent

The 1982 inventory (which was not as thorough as this year's) showed that approx. 560 000 hectares, or 7.6% of the country's total forest land, was damaged.

This year's inventory shows that 2.5 million hectares, i.e. 34.4%, which is to say over a third of total forest land has been hit! (See Table 1.)

In terms of area, the greatest damage has been suffered by spruce: 1.2 million hectares, or 41% of the total stock, has been damaged. Damage to pine covers 0.6 million hectares, or 43% of the total stock. The species hardest hit, and now regarded as threatened with extinction, is silver fir, which is to be found above all in Southern Western Germany. Although the actual area affected is only 0.13 million hectares, 76% of the stock has been hit. Among deciduous trees, the hardest hit is beech with 26% of the stock, 0.33 million hectares, affected. Roughly 0.25 million hectares with other types of tree, such as larch, Douglas pine, oak, red oak and rowan, have been damaged. (See Table 2.)

Table 1: Extent of damage to forest land 1982 and 1983, by species.

Species	1982	1983	1982	1983
	Million hectares		In % of species area	
Spruce	0,270	1,194	9	41
Pine	0,090	0,636	5	43
Silver fir	0,100	0,134	60	76
Beech	0,050	0,332	4	26
Oak	0,020	0,091	4	15
Other species	0,032	0,158	4	17
Total	0,562	2,545	8	34

Roughly two-thirds of the damaged areas are in the two southern German regions of Bavaria and Baden-Württemberg, and there over 45% of the stock has been

damaged. Other areas have also suffered severe damage, including Harz, Eggegebirge and Sauerland. Generally speaking, the highlands seem to be harder hit than the lowlands, but the latter have also suffered.

One of the difficulties in estimating the exact scale of damage is that forest owners are to an increasing extent felling and removing the hardest hit trees before they die, to avoid financial losses in that the timber might otherwise be destroyed. This means a certain under-estimation i) of the total scale of damage, and ii) of how extensive the most serious damage really is.

Badly damaged stand of Norwegian spruce in Harz *Photo: Christer Agren*

Financial consequences

Government authorities have not yet succeeded in producing any estimate of the financial consequences arising partly from reduced growth, partly from the lower quality of timber.

Inofficial estimates, however, suggest that losses are already in the scale of DM 7-10 billion per year.

In this context, we should mention also that the very great importance of the forests for tourism and recreation is naturally being affected. Locally, the economics of water supplies can also be disrupted. On top of which we have the feared negative effect on soils, climate, and the life environment of the fauna and flora.

Counter-measures

The report observes that the most important and acute measure to stop damage to forest land is to reduce emissions of air pollutants. Emissions of sulphur dioxide and nitrogen oxides must be cut back. This would achieve a reduction also in the conversion products to which they give rise, namely acids and photo oxidants. Emissions into the air of heavy metals must also be reduced.

These measures will not only benefit the forests, but also reduce the direct threats to human health, reduce the acidification of soils and water-courses, and reduce the damage caused by corrosion to works of art, buildings and materials. The report emphasizes, finally, the importance of emissions being restricted not only on a national basis, but also in other European countries, since air pollutants are transported over the national frontiers.

The report is entitled *"Neuartige Waldschäden in der Bundesrepublik Deutschland"* and is published by Bundesministerium für Ernährung, Landwirtschaft und Forsten, Bonn 1983.

Christer Ågren

Table 2: Damage to forest land by species

Species	Forest area (Areas occupied by species)		of which damaged (Category of damage 1+2+3)		
	Million hectares	In % of total forest area	Million hectares	In % of total area of species	In % of total area damaged
Spruce	2,951	40	1,194	41	47
Pine	1,464	20	0,636	43	25
Silver fir	0,176	2	0,134	76	5
Beech	1,250	17	0,332	26	13
Oak	0,615	8	0,091	15	4
Other species	0,950	13	0,158	17	6
Total	7,406	100	2,545	34	100

Forest death in Sweden!

During the summer and autumn, alarming reports from both private forest owners and regional forest authorities on damaged stock have been streaming into Sweden's central authority, the National Swedish Board of Forestry.

Spruce

These reports have stemmed mainly from the southern and western parts of Sweden, and relate above all to Norway spruce (Picea abies), which is the dominant species of tree in Sweden. The damage is evident mainly on older trees (over 50 years), but damage has been observed locally even in younger stock. The symptoms are very like those observed in similar stands in central Europe, which is to say the discolouring of needles from light-green to yellow and brown, early fellings of needles, thinning out of tops, hanging and dying lateral branches, the development of "emergency" shoots on damaged branches etc.

Pine

Damage is occurring also in pine (Pinus silvestris), with the needles turning reddish brown and dropping, and the top being gradually thinned out. Pine is the second most common species of tree in Sweden.

A quick inventory

To get some idea of the extent and scale of damage, the Board of Forestry initiated a quick overall inventory, which was performed in the ten southernmost counties during November-December. The final results are expected to be published in February, but advance reports from certain districts on the Swedish West Coast suggest that more than 10% of the stock has been damaged.

Damage since 1978

Arne Johansson in Hallandsboda is one of the foresters who has been hit. His estate lies in southern Sweden, on the boundary between Halland and Småland.

"I've been working in the forests since I was 15," he tells us. *"But I've never seen the like of this before."*

Arne Johansson began to notice the damage as early as in 1978. Since then it has developed at increasing speed. In his judgment, every other spruce on his property that is more than 40 years old has been affected. He observes the slightest suggestion of needles turning brown. And he is in no doubt that the cause of the damage is air pollution.

"You can simply read it from Nature. In my case the damage runs towards the south-west."

Nor is it only damaged spruce that worries Arne Johansson. The seedlings in a young pine forest only have this year's needles left, although they normally should have at least three year's needles.

Damages on spruce in Blekinge, south-eastern Sweden. Photo Kjell-Arne Larsson

Arne Johansson, a forester in southern Sweden: "Since four, five years I have continously been felling damaged trees." Photo: Gert Svensson

Causes

In Sweden, as in several other countries, there are various explanations for the damage. The great majority, however, of researchers, forest owners and environment organizations agree that the main factor is air pollution. There is some argument, however, whether it is the direct effect of air pollutants on the trees (and in that case which pollutant or pollutants play the greatest role), or their indirect effects through acidification of the soil (leading to potentially poisonously high concentrations of aluminium, increased contents of heavy metals, the leaching out of essential nutrients etc.) that constitute the main cause. Despite everything, the most probable answer is an interplay of these factors, which in combination give rise to what we call an "accumulated stress" in trees, and thus weaken them. The result is that their power of resistance is impaired, and they become markedly more sensitive to various forms of secondary factor, such as drought and frost, and more vulnerable to attacks by injurious insects and fungi.

New findings

It can be mentioned that recently published research results from investigations in south-western Sweden show that a considerable acidification of the soil has occurred over the past 40 years. In 1927 acidity was measured at various depths in the ground at a large number of places within a limited area in Halland. Researchers have now revisited precisely these places, and performed the measurements again, using similar methods. The result shows that pH has dropped by approx. 0.4 units during this period. Measurements have been made right down to a depth of 70 cm. Similar comparative measurements in northern Sweden, which has been subjected to considerably less acid rain, shows a much slower acidification.

Great publicity

This alarming state of affairs has naturally been given great publicity in the Swedish mass media. This is natural, since any development of the damage to a scale like that we have seen in, for example, West Germany, would entail very serious consequences for Sweden. Some 300.000 people work in Sweden's forest industries, and the value of the forestry sector's production in 1981 exceeded SEK 50 billion. (The value of the forests for tourism and as a source of recreation, and their importance for the climate, fauna and flora can naturally not be estimated in strictly economic terms.) And since approx. 85% of Sweden's exports of forest products go to West European countries, reduced production in Sweden could have important consequences also in Europe.

Christer Ågren

Norwegian forest owners anxious about damage to woodlands

Fear that acid rain is culprit

Anxious Norwegian owners of forests have asked the authorities for more research on the connection between acid rain and damage to forests. The woodland owners have been frightened by the dramatic developments in European continental forests. In southern Norway, the tips of spruce trees are also showing signs of damage.

Forestry researchers doubt that West German conditions will spread to Norway, but they agree that more research is necessary in this area.

30% damaged

The greatest alarm about forest damage in Norway is being voiced in the most southerly parts of the country. A woodland owner in the county of Vest-Agder claims that the tips of 30% of the trees are damaged. Young trees are the worst affected. Recently, pine needles too have begun to show signs of damage.

The forest owners say that they themselves are not competent to decide the causes of the damage, but reports, especially from West Germany and Sweden, have increased fears that acid rain plays an important role in the process. The damaged woodlands are in the area in which fish kills first occurred in Norway. The poor soil in these districts absorbs large quantities of acid rain, brought by south-westerly winds from the U.K.

Researchers' dispute

However, forestry researchers are not convinced that acid rain is directly responsible for the destruction of spruce tips and needles. Compared with countries which are major exporters of air pollution, concentrations of sulphur dioxide and other types of pollution in the atmosphere of southern Norway are minimal, they say. The researchers prefer a climatic explanation of the damage. They do not however exclude the possibility that air pollution transported over long distances can be involved. Excessively high concentrations of ozone, for example, are regarded as a very likely cause.

Whatever the causes of damage to forests, the woodland owners are now so worried that they have written to the Norwegian authorities asking for much more research to be done in this area. They also demand a better system for reporting the extent of damage of the type which has occurred in Vest-Agder.

More research

The Norwegian Ministry of Environment also supports the idea of more research. The Ministry has asked the forest owners to sketch out the problems about acid rain and forests which they believe should be studied. Such a plan is to be prepared in January, but it is already clear which problems the researchers are most interested in working on. Apart from the effects of ozone on forests, they also wish to look more closely at the long-term effects of the addition of nitrogen to the soil via acid rain. A third aspect worth studying is how soil nutrients are leached out of the soil through the action of acid rain.

Trygve Aas Olsen

About 700 persons took active part in the Freudenstadt conference to stop the dying of forests.

Photo: Christer Agren

Freudenstadt proclamation for saving the forests

Natural forests are an evident expression of a sound nature. A sound nature is the most important condition for our and our descendants' lives.

With this concern the participants of the "Action conference against acid rain and the damaging of the forests, Freudenstadt Sept 30 — Oct 2" ratified the following proclamation urging citizens and those liable in politics and industry to act according to it. All political and social groups are urged to focus their financial and personal means on saving the forests.

If considerable measures will not be taken immediately, an ecological and economic catastrophy of incredible dimensions will be inevitable. For several years, accelerating dramatically during the latest months, the forest has been dying in large areas.

With the forest disappears a vast and multiple system consisting of countless animals and plant species.

The dying forests are only the most obvious result of a continuous gigantic air pollution in the industrialized countries. If this air pollution will not be stopped immediately, Central Europe will no longer be recognizable within a few years. The forested regions of Europe threaten to turn into steppes. Where the forest dies, there dies mankind. For the sake of a doubtful materialistic progress, of an increase in consumption and profit we wage war against nature. With the forests we destroy our most important sources of drinking water and oxygen. We destroy immense cultural and economical values. Hundreds of thousands of jobs, long grown subsistence on forest estate, valuable recreational areas and many more bases of life will be lost. Aspiring for prosperity we forget our human and Christian responsibility for nature. We are being challenged. The bases of life for our children and grandchildren are endangered.

For many reasons the construction and operation of nuclear power plants cannot stop the destruction of the forest.

The actions taken so far by the government to reduce air pollution are totally insufficient.

The foresters Dr. Petri and Mr. Trefz explaining the forest damages for the participants at the Freudenstadt conference.

Photo: Christer Ågren

According to all we learn from scientists and forest men, our forests will die inevitably still in this decade if we deny the fact that natural laws do not allow compromises.

We demand as immediate emergency measures:

— *drastic reduction of the emission of toxic substances from power plants and industrial complexes,*
— *aggravation of the TA Luft and the Großfeuerungsanlagen-Verordnung,*
— *criterion has to be the protection of the most sensitive animals and plants,*
— *invention of a comprehensive duty for toxic substances (especially for SO_2, NO_x and heavy metals),*
— *invention of lead-free gasoline and effective detoxication measures for vehicles starting from Jan. 1st, 1985,*
— *reshaping the law for energy management from 1935 to accomplish an energy management compatible with the environment,*
— *joint European measures to reduce air pollution according to the highest possible level.*

Whoever is able to act but does not do, is implicated in the death of our forests and, by that, in the destruction of the foundation of our life.

Freudenstadt, October 2nd, 1983

Anglers under an acid cloud

Conference in the U.K., October 1983.

Fishermen are used to the pollution of their lakes and rivers by farm and industrial waste seeping into the water from the land but have not grasped the idea that there is a new enemy above them. An acid sky.

The acid, contained in smoke from oil and coal-burning power stations and factories, previously localised, is now lifted by high chimneys into the upper air drifts, is carried hundreds of miles and falls in snow and rain on previously unspoilt country.

The chairman of the EEC's advisory committee on fish farming, Graham Gordon, who rears trout at a fish farm in Galloway in Scotland, told a conference at Two Lakes in Hampshire last weekend that he's already lost 20.000 fish because of acid waters.

"It's killing the wild fish on my farm, one of the first to show signs of it in Britain. We're seeing the first signs here that they saw in Norway 20 years ago. Unless its stopped it'll affect everything, trees, birds, vegetation, the very balance of nature as we know it."

A former conservator of the Forestry Commission in southern Scotland, E.J.M. Davis, said there were some lovely little hill lochs in Galloway that had been affected. There was not a fish in Loch Enoch now; and Loch Grannoch, which had a long history of successful fishing, had become sterile. *"The rain had come down like vinegar on Loch Dee and killed all the young fish."* Great efforts had been made to revive Loch Dee and it was now a put-and-take fishery.

Dr Rosseland, of the Norwegian Directorate of Wildlife, told the conference that many of the salmon rivers in southern and south-western Norway no longer held fish. Dr Bengtsson, of the Swedish National Board of Fisheries, said that 20.000 of the country's 90.000 lakes were now affected by increased acidity and of that 20.000 some 5.000 were badly affected: some completely empty of fish, some with just a few surviving. The acid rain came to Sweden from all over Europe but England was the worst offender. Dr Dodge, of the Canadian Ministry of National Resources, gave a full account of their problems from the United States smoke drifts.

Conrad Voss Bark

From The Times Oct. 13, 1983

EEC demands change on pollution

Acid rain now affects every country in western Europe. This was the consensus that emerged at a conference of the European Community held this week in Karlsruhe, West Germany. Scientists from 18 countries — though none from the eastern bloc, one of the main sources of air pollution — faced the problem: when should research end and action begin?

The politicians who opened the meeting were in little doubt. Lothar Spath, the prime minister of Baden-Württemberg, said it was time to act to save his state's forests. "The Black Forest is without price," he said. His concern is not entirely altruistic; the European Commission estimates that acid rain could cost the jobs of 47.000 forestry workers in West Germany alone.

Dr Karl-Heinz Narjes, speaking for the Commission, said the EEC should take what action it could now. Measures should include cutting emissions of sulphur dioxide from power stations.

But a British scientist, Fred Last of the Institute of Terrestrial Ecology questioned some of the research on which politicians are basing their decisions. He pointed out the limitations of experiments that simply determine the effect of large doses of single pollutants — a rare phenomenon in nature. Despite work on acid rain dating back to 1972, Last said that scientists have only recently adopted proper procedures.

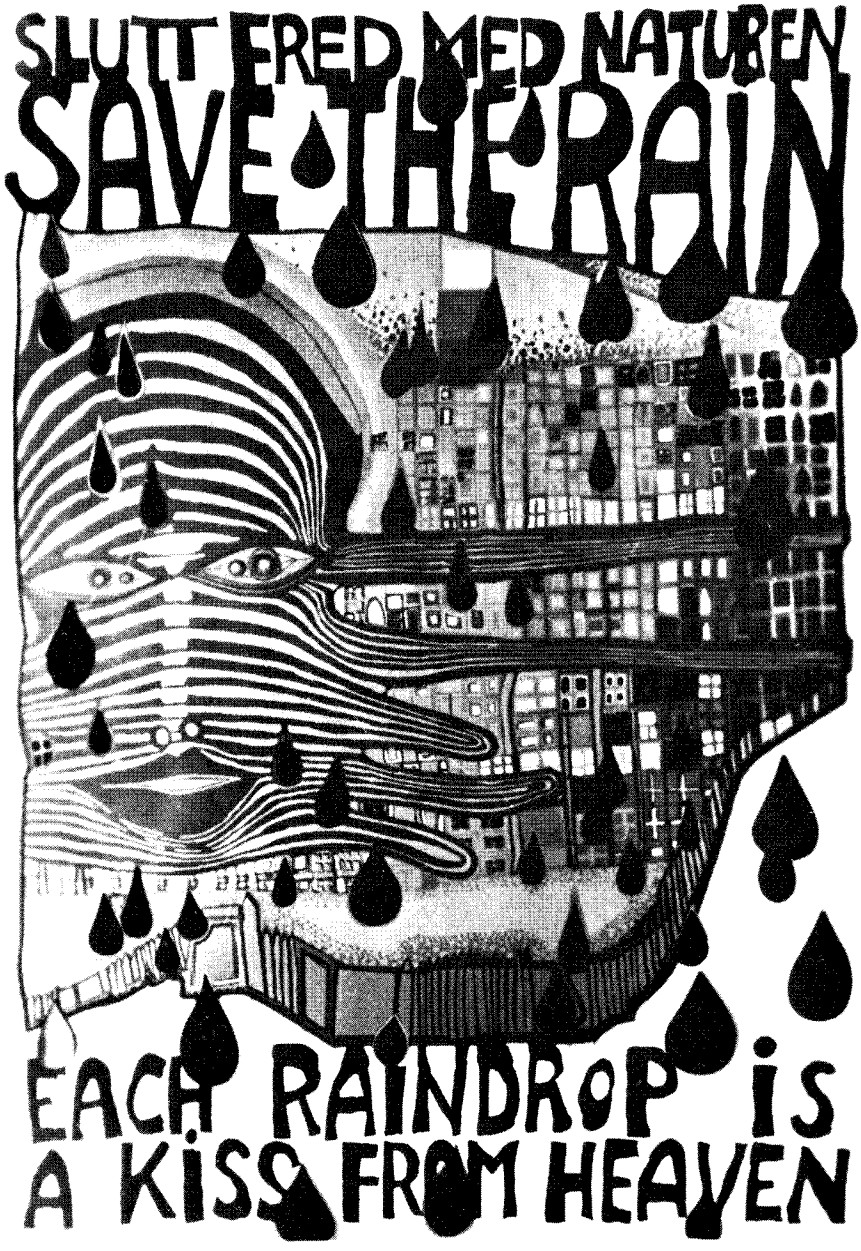
For example, the discovery that sulphur dioxide damages the roots of plants should have come a lot earlier than it did. "It is deplorable that our understanding of pollution is so imperfect," he said.

He called for more work on the macroscopic effects of pollutants under real life conditions and said that future work "needs to be much more sophisticated about the manner of observations. Roots are the determinants of plant growth to a much greater extent than has been realised."

Michael Cross

From New Scientist 22 Sep 1983

Famous painter fights for nature conservation: — Save the rain



*The poster "**Save the Rain**" is painted in six colours, with additional metallic printing in four colours.*

The Austrian painter Hundertwasser takes part in the fight to stop acid rain. At a press conference in Oslo, the 17th of October, he presented his latest work, the poster "Save the rain". This poster is a gift to the Norwegian Society for Conservation of Nature, and is sold in Norway for the benefit of the Society's work.

Hundertwasser stresses that the message of the poster should be given the major attention. In Austria, and in other countries on the European continent, acid rain has become a very topical subject. Huge forest areas are affected by the pollution, and the trees are dying.

Hundertwasser planted three trees in an Oslo City park as a warning to the authorities and members of the public of this enormous environmental treat.

Germany's lead promise

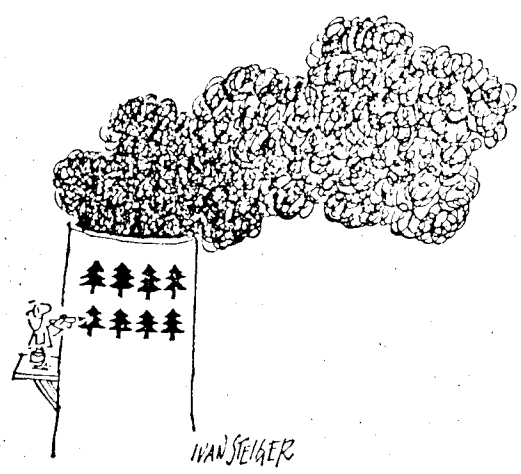
West Germany's car manufacturers will offer modified cars using unleaded fuel before the legal deadline of January 1986. As soon as petrol stations can provide sufficient quantities of unleaded fuel, the car companies will start to sell the new modified cars. The move follows a meeting last week between the West German Minister of the Interior, Herr Zimmermann, and the chairman of the West German car manufacturers' organisation. Herr Zimmermann has also promised tax reductions on unleaded fuel.

From New Scientist, 17 Nov. 1983

Taj Mahal Threatened

Very shortly a 6 million metric ton-a-year oil refinery in Mathura, a small town in Uttar Pradesh — India's most populous state — will go into full-scale commercial production. It has been the subject of a bitter environmental controversy since the priceless Taj Mahal in Agra lies only 40 km away and some experts believe that emissions of sulphur dioxide from the plant may contribute even more to the disintegration of this 340-year-old architectural marvel.

From AMBIO Vol. 12, No. 2, 1983



New publications

"DAS WALDSTERBEN — Ursachen, Folgen, Gegenmassnahmen" (1983)
Published by: Arbeitskreis Chemische Industrie und Katalyse Umweltgruppe Köln

A good and comprehensive new book of 366 pages, written by several authors who are experts on different aspects of acidification. The book describes in easily comprehensible terms the causal connections leading to "forest death", its consequences for human beings, animals and the countryside, the symptoms of damage (with a large number of colour photographs and figures), and various technical solutions. It also demonstrates how energy policy and environment policy have assisted the development of this environmental disaster, pointing to the fundamental need for a changed thrust in these respects. It further presents a thoroughly considered plan for how emissions of sulphur and nitrogen oxides can be reduced in Western Germany.

The book costs DM 25 plus postage (30% discount for environment organizations), and can be ordered from:
Verlag Kölner VolksBlatt
Palmstrasse 17
D-5000 Köln 1
F.R.G.

"SO STIRBT DER WALD — Schadbilder und Kreinkheitsverlauf" (1983)
Schütt et al

With the help of informative text and numerous excellent colour photographs and figures, this book shows how to recognize damage to forest land caused by air pollutants. 96 pages. It costs approx. DM 10 plus postage, and can be ordered from:
BLV Verlagsgesellschaft
Postfach 40 03 20
D-8000 München 40
F.R.G.

"ACID RAIN — The politics of pollution" (1983)
Acid Rain Information Group/ Nigel Dudley

This is a new 16 page pamphlet giving a short introduction to the acid rain problem, with special emphasis on the United Kingdom. It shows the causes to and the effects of acid rain, and describes solutions now available to deal with the problem.

Can be ordered for free (+ a small donation to cover post and packing) from:
A.R.I.G.
c/o Earth and Resources Research
258 Pentonville Road
GB-London N1
Great Britain

"ACID RAIN — A review of the phenomenon in the EEC & Europe" (1983)
Environmental Resources Ltd.

This report is initiated by the Commision of European Communities. It evaluates critically the extent of environmental damage claimed to be caused by acid rain, describes the mechanisms by which acid pollutants are thought to effect environmental changes, and discusses likely future trends in emissions. The report also considers the costs and possible benefits of alternative emission control strategies, and suggests areas for further research.

159 typewritten A4 pages, price pounds 14.50 incl. post. Available from the publishers:
Graham Trotman Ltd.
66 Wilton Road
GB-London SW1V 1DE
Great Britain

Stop emissions of air pollutants — Stop acidification!

A demand from the farmers and forest-owners of Europe

The 35th General Assembly of the European Confederation of Agriculture (CEA) was held in Wiesbaden from 26 to 30 September 1983. One of the resolutions taken relates to the threat presented to forest land, farming land and water by long-distance air pollution.

All the farmer's and forest-owner's organizations in Western Europe stand behind the unanimously adopted resolution.

Call for immediate and decisive action

1. Soil, water and air are essential factors in production for agriculture and sylviculture, and their integrity is a prerequisite for the production of sound food and for the quality of life.

   In the present situation, there seems to be no probability in the short term of an appreciable reduction in the pollutant load to which agricultural and sylvicultural land and lakes are subjected, or of a reduction in the resulting damage. →

New film: Acid Rain — Who Cares?

This film tells the story of the Swedish boy Andreas who is trying to persuade his friend Camilla in London to do something about the problem of acid rain and the acidification of lakes and soils.

Andreas has, as many other Scandinavians, discovered that the lakes have become fishless, birds have disappeared, and the nature in general has become silent. This is due to acid rain and acidification of the lakes. The acid rain is in turn caused by pollution from high chimneys and car exhaust pipes.

More than 75 per cent of the air pollution that causes the destruction of nature in Scandinavia comes from countries abroad. One of the worst polluters in Europe is the United Kingdom, and a lot of the pollution from the UK ends up in Scandinavian lakes and streams — spreading the plague of acidification.

But today damage is also reported from the UK itself. The film tells the story of dying lakes in Scotland and in the Lake District, it shows how fish farms are destroyed by melting acidic snow, and it also reports how acid drinking water can cause lead poisoning amongst the people who drink the water. Lead piping is still used for drinking water in the UK!

In Sweden, in West Germany and in many other countries, the forests are dying. Millions of acres of valuable forest are already dead, many more are dying. Can this catastrophe be stopped?

Yes it can! The film "Acid Rain: who cares?" shows how many countries have adopted techniques and legislation to combat the air pollution. Britain has not.

Facts about the film:
Duration: 29 minutes.
Full colour 16 mm film, optical sound (all in English) or: video-cassettes (VHS)
Produced by Scandinature Film Production for the Swedish Environmental Protection Board, 1983.
Producers: Bo Landin, Hans Östbom.
Available from: Bo Thunberg, Swedish Environmental Protection Board,
Box 1302, S-171 25 Solna
Sweden
tel. 08 - 98 18 00 (ext. 212)

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2. The CEA therefore calls for prompt action along the following lines:

   Pollutants must be controlled at source by measures including changes in the tolerance limits for emissions from large-scale thermal plants, a radical reduction in the sulphur content of domestic heating systems emissions and tolerance limits for exhaust gases. In addition, every effort should be made to save energy and to encourage the use of renewable energy sources with a view to reducing damage.

3. The efficiency of these measures depends crucially on the success of the efforts to induce all European States, of both East and West, to take concerted action. The UN/ECE "Convention on Long-Distance Transfrontier Atmospheric Pollution" is a first step in this direction, and must be followed by effective measures.
4. The very existence of the farms and commercial forests affected is gravely threatened. They can no longer support the economic consequences of the damage caused now and in the future by pollutants. In view of the large number of polluters and the appearance of damage over a wide area, it is now virtually impossible to assign responsibility to any one polluter. Compensation for the damage must therefore be forthcoming from public funds if no directly responsible agent can be identified. But agriculture and sylviculture prefer healthy forests, fields and waters to financial compensation.
5. The CEA emphatically draws the attention of the responsible politicians to the gravity of the situation and calls for immediate and effective measures for the consistent and radical reduction of pollutant emissions, for mobilization of science and research and for the international dissemination of their findings. In particular, decisions already made must be followed by practical results as soon as possible.
6. Public opinion must be kept constantly informed of the gravity of the situation.
7. Healthy agriculture and sylviculture provide millions of jobs in Europe and thus make a considerable contribution to gross national product. Hence atmospheric pollutants seriously affect national economies if the extent of the damage is weighed against the saving on short-term investment resulting from inertia. Europe's farmers and sylviculturalists will closely follow the action of Governments in response to the scale of the danger.

EC-proposal: Drastic reductions of SO_2- and NO_x-emissions!

The commission proposes an EEC directive to limit emissions of pollutants into the atmosphere by large combustion installations.

Tuesday 13 December 1983 - The European Commission, at the proposal of **Mr Narjes,** has just approved a proposal for a Council Directive concerning the limitations of emissions of pollutants into the atmosphere by large combustion installations. This text, which is notably aimed at **traditional thermal power stations,** is a reply to the appeal launched last June by the European Council in Stuttgart relating to the urgent need to speed up and strengthen action at the national, Community and international levels to combat environmental pollution; the heads of government particularly stress the serious danger threatening European forests, for which immediate action is necessary.

Drastic reductions

The proposal for a Directive aims to substantially reduce emissions of **sulphur dioxide (SO_2), oxides of nitrogen (NO_x) and dust** from large combustion installations. These installations are responsible for more than 80% of all emissions of SO_2 in the Community and for about 40% of NO_x emissions (an equal share of the NO_x emissions are accounted for by motor vehicles). The proposal advocates the setting of an **overall objective for the reduction of total annual emissions** from large combustion installations: −60% for sulphur dioxide, −40% for dust and −40% for the oxides of nitrogen. The objective is to be achieved by the end of 1995 and it will be determined in comparison with the corresponding emissions for 1980. Secondly, it is planned to **introduce Community emission standards** for these pollutants, to be respected by all new combustion installations of a certain thermal power, from 1985. Finally, certain provisions concern the **measuring and overlooking of total annual emissions** as well as of the individual emissions from the installations concerned.

Power stations

The proposal is largely inspired by the German regulation on large combustion installations, which lays down the setting of standards which are binding both for new and existing installations. The requirements are more severe for high-power units, above the threshold of 300 MW; within this category are essentially electricity power stations, whereas in the range between 50 and 300 MW, there is a high number of industrial boilers for the production of heat or of heat/force.

Out of the total emissions of SO_2 from large combustion installations between 50 and 75% come from electricity power stations, industrial boilers producing between 25 and 50%; the proportions and the distribution of the number of installations included in the two categories varies quite considerably from one country to the next.

New and old installations

All **new installations** will be subject to the respect of limit values for emissions set in Annex I of the proposal for the three pollutants in question (SO_2, NO_x and dust). These values are based on the best technology currently available, according to the fuel and the type of apparatus concerned, and they have proved their reliability in industry (without demanding disproportionate costs). They are scheduled over time for SO_2 and NO_x in order to take account of the technological evolution.

As far as **existing installations** are concerned, the Member States are asked to establish appropriate programmes which are able to differ in the choice of means but which must lead to the same percentage reduction of overall annual emissions from large combustion installations, existing and new, by 1995.

Different strategies

The Member States are free either to apply a systematic proceedings put to the limit values to be imposed on existing installations, to take selective measures which concentrate efforts on certain installations, or to promote a speedy substitution with new installations, use more low-pollution fuels, resort to other energy sources (nuclear) or use a combination of measures adapted to their situation.

Costs - benefits

As far as **costs** are concerned, the Commission believes that, according to the maximum case which predicts the construction by the year 2000 of a total of 40.000 MW in new installations of 300 MW or more in the Community as a whole, and assuming an amortization period of 25 years and a rate of interest of 8%, the investment necessary would involve an **annual additional cost of 0.37 billion dollars.** This would mean an increase in the cost of electrical energy produced of 0.19 cents/KWh. To this must be added the extra functioning costs of about 5 dollars/tonne of fuel, which give a total of 0.12 cents/KWh, adding up to a surplus **0.31 cents/KWh, which represents less than 10% of the cost of production.** The various costs of damage attributed to emissions of SO_2 and NO_x (which could be avoided by a reduction of emissions) are estimated by the Commission to be at least the same as the additional annual costs required for the installations necessary for the planned reduction of emissions in the Community as a whole.