

# Acid News

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



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POLAND

## Radical policy reform

POLAND IS CONSIDERED by some market analysts to be the most western-minded of the former socialist countries of eastern Europe. However that may be, it is certainly among those that have most radically reformed their environmental policies.

Polish observers reckon 1991 as the country's year of breakthrough for environmental protection. Key phrases in its new policy, adopted by parliament in that year, are efficiency, adaptation to ecological needs, regionalism, and PPP (polluter pays principle). It is intended that there

shall be a gradual application of that principle during the nineties, although for the moment it can only be on a modest scale. This is because it is impossible to lay full financial responsibility on undertakings that have to clean up after the negligence of the former political system. Many firms would in any case go bankrupt if they were forced to pay even a part of the cost themselves. What will be done instead is to divide the responsibility between the polluters and the regional and national authorities.

Public investments in environmental improvements will mostly be

financed through the charges and fines that polluters will have to pay. The money so forthcoming will be apportioned equally between the National Fund for Protection of the Environment and the country's forty-nine administrative districts.

Environmental charges have recently been sharply raised. Now, in 1992, it costs for instance the equivalent of \$84 to emit one ton of sulphur dioxide or nitrogen oxides.

Fines are imposed if it is found that a firm is emitting more pollutants than its permit allows. The

*Continued on page 3*

# Acid News

A newsletter from the Swedish and Norwegian Secretariats on acid rain.

ACIDNEWS is a joint publication of the two secretariats, whose aim is to provide information on the subjects of acid rain and the acidification of the environment.

Anyone interested in these problems is invited to contact the secretariats at either of the addresses below. All requests for information or material will be dealt with to the best of our ability.

In order to fulfill the purpose of Acid News, we need information from everywhere – so if you have read or heard about something that might be of general interest, please write or send a copy to:

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## THE SECRETARIATS

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- The Environmental Federation (Miljöförbundet)
- The Swedish Anglers' National Association (Sportfiskarna)
- The Swedish Society for Nature Conservation (Naturskyddsföreningen)
- The Swedish Youth Association for Environmental Studies and Conservation (Fältbiologerna)
- World Wide Fund for Nature Sweden (Världsnaturfonden WWF)

Address and telephone: see above.

The Norwegian Secretariat, "The Norwegian Clean Air Campaign," is organized by five non-governmental organizations concerned with the environment:

- Nature and Youth (Natur og Ungdom)
- The Norwegian Forestry Society (Det Norske Skogselskap)
- 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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# On sulphur in oils

ALMOST HALF of the emissions of sulphur in the European Community stems from the petroleum sector, through the burning of oil and the emanations from refineries. The rest comes mainly from burning coal for the production of power and heat. If no further measures for control are introduced, the proportion of the emissions from the petroleum sector is likely to increase during the nineties, since the emissions from coal burning are expected to decline.

In June 1990 France urged the European Commission to produce a proposal for reducing the emissions of sulphur from this sector. In their missive, known as the French Memorandum, the French put forward definite proposals for a limitation of the sulphur content in some types of oil as well as of the emissions from refineries.

There is now an EC directive limiting the sulphur content in gas-oil types – diesel and domestic oils used for domestic and industrial heating – and in April last year the Commission proposed a further reduction (see Acid News 4/91, p. 5). On the other hand there are as yet no corresponding EC regulations for heavy oils, which often have a sulphur content of 2-4 per cent. Nor is there any regulation of the sulphur content in marine fuels.

In a statement from its environment directorate, the EC Commission gives approval to the French proposals, and announces its intention of taking the matter up in its program of work for 1993.

Some of the EFTA countries have had limitations of the sulphur content of heavy oils for a long time now. In Sweden, for instance, there is a general limit of 0.8 per cent, while locally, especially in the country's larger cities, the fuel oil may have a still lower sulphur content. In Sweden, too, there has been a system for the environmental classification of diesel oil in operation for some years. Environmentally better types (with a lower sulphur content, for instance, than the maximum limit of 0.2 per cent) are favoured by a lower tax.

Greatly reduced emissions of sulphur will be necessary if acidification is to be stemmed in Europe.

Regulations for limiting the sulphur content of the various types of oil will therefore be an important element in the mix of measures that will have to be undertaken. The fact of the petroleum sector having such a large share of the emissions underscores the importance of quickly applying measures just there.

To be effective, however, such measures will have to be considerably tougher than those proposed in the French Memorandum. They ought also to be applied sooner.

Any directives for a further limitation of the sulphur content of oils are likely to take the form of "harmonizing directives." In other words they will be adopted under Article 100A of the Single European Act. The reason is that petroleum products are classified as goods that are traded across national frontiers, and are thus involved in the operation of the internal market. In practice this would mean that all the EC countries, as well as the EFTA ones through the EES treaty, would be expected to have the same rules. This would make problems for those countries that already have stricter regulations, and also for those that want to introduce them.

With total harmonization at a given level, which in fact would mean setting maximum limits, there would be a risk of the development of new, environmentally better technologies being held up, at least temporarily. Such measures might therefore turn out to be "technology conserving." If instead the requirements were to be made successively stricter over a period of years, as has been done for instance in California in regard to emissions from automobiles, this could encourage the development of better environmental techniques and thus be "technology forcing."

In everything concerning environmental protection it should, as a matter of principle, be allowable for individual countries to impose stricter controls than those required by international agreements, and for them to use means, such as financial incentives, to favour more environmentally benign alternatives.

CHRISTER ÅGREN



*Continued from front page*

fine, which is three times the environmental charge, must be paid repeatedly until emissions are brought down to the permitted level.

In 1991 the total income for environmental charges amounted to \$1 billion. The hoped for goal of \$1.6 billion proved to be unattainable, because the business recession

turned out to be deeper than expected. Expenditures for environmental protection in that year corresponded to 1.2 per cent of the gross national product, but it is thought they should be at least 1.5 per cent, which might be considered the minimum for an industrialized country.

It is now intended that market forces shall play an important part

in Poland's environmental policy. The Ministry for Environment has for instance just started a project in Chorzów, one of the most polluted towns in the district of Katowice, which aims to reduce the pollution by means of a modified system of trading in emission credits. A similar arrangement is being planned for Krakow.

The national strategy for the next thirty years may be divided into three stages:

STAGE 1. To eliminate, within three years, such sources of pollution and other environmental abnormalities as constitute an acute threat to human health. The requirements will be especially strict in regard to the thirty worst polluters.

STAGE 2. To achieve, within ten years, conformity with western European environmental standards. Actually the emission standards for new or modernized plants are already in line with EC requirements, and the requirements for older ones will gradually be made stricter.

STAGE 3. To make "sustainable development" the governing principle for the whole economy. In this case within thirty years. It is thought that the cost of achieving ecologically sustainable development will be about \$260 billion, although it might be less if Poland were to give priority to "clean technologies" rather than the "end-of-pipe" kind.

A tricky question, which may affect the future of environmental protection in Poland, is how far the environmental aspects are to be considered in the process of privatization. According to spokesmen from the Ministry of Environment and the State Environmental Protection Inspectorate (Polish acronym PIOS), officials of the Ministry for Privatization are not interested in the environmental aspects, regarding them as a hindrance to rapid privatization. They believe that ignoring them will make it easier to sell Polish enterprises to foreign investors.

## ***On the following pages***

Dilemma for Greens in Estonia	5	Aircraft and global warming	11
EC program for East Europe	7	Solar heat for housing	12
Assessing traffic emissions	8	American ways to clean air	13
Transport and the environment	9-10	Half-measure on climate change	16

As a result, prospective investors have in several cases become suspicious and begun to examine the environmental aspects of the matter themselves. Among those that have done this are automobile manufacturers and papermakers.

One reason for the privatization ministry's attitude is that the law does not require an environmental accounting prior to sale. Such an accounting would however provide a basis for bargaining between buyer and seller as to who shall bear the costs of cleaning up. The Ministry for Environment is convinced that it would improve Poland's negotiating stance if environmental accounting was introduced as a regular procedure.

A reason, too, for insufficient consideration being given to the environmental aspects is that they are usually disregarded in the financial and technical studies that are made before any firm is privatized. Such studies are paid for by the World Bank or the European Community, and if they wished, these bodies could insist that attention be given to possible environmental problems.

The changeover from a planned to a market economy is proceeding very fast in Poland, often so fast that the district authorities cannot keep up with it. The environmental protection department in Katowice, for instance, had at the time of writing only managed to get in touch with 4000 of the district's 10,000 enterprises, and had no idea of what the remaining 6000 were doing, who owned them, or what pollutants they might be emitting. This situation arises because new firms are continually being set up, former subcontractors to big state enterprises have suddenly made themselves independent, and there is often a rapid turnover of ownership.

Poland's environmental problems are largely due to the enormous burning of coal. Higher prices for energy, together with economic recession, have however led to a considerable decrease in consumption. Whereas in the case of hard coal it amounted in 1987 to 163 million tons, by 1990 it had fallen to 120 million.

It is estimated that the combined losses for hard-coal mining in 1992 will amount almost \$1 billion, and a third of the country's mines are under threat of closure. A loan of \$200 million recently granted by the World Bank for reconstruction of the

industry will be used to hasten the shut-down of eighteen mines, introduce new mining techniques, and improve environmental protection.

At present there is no source of energy to replace coal. Poland has decided for the time being to refrain from turning to nuclear power, and



deliveries of oil and gas from the Russian Commonwealth remain uncertain.

Because of this great dependence on coal, and a generally wasteful use of energy, the emissions of carbon dioxide are very high. In 1988 they amounted to 457 million tons, which

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*Poland's problems are  
largely due to the  
enormous burning of coal*

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is about 2.3 per cent of global emissions. The aim is to get below this figure by 2005, and then go on lowering it. The policy for achieving this aim includes:

- ☐ A general restructuring and modernization of industry.
- ☐ Reduction of coal consumption by 20-30 per cent, and increased use of gas.
- ☐ Modernizing some old power plants (including conversion to combined power-and-heat).
- ☐ Lowering the number of inefficient coal burners in residential property.
- ☐ Implementing a broad energy-saving program.
- ☐ Promoting energy from renewable sources.
- ☐ Gradual scrapping of old motor vehicles.

During the eighties the emissions of sulphur dioxide ran at about 4

million tons a year. Several factors, including reduced industrial production, a lower use of energy, and a greatly increased charge on emissions, have combined to bring this figure down. Emissions in 1990 amounted to 2.8 million tons, or 24 per cent less than in 1980.

As a result of measures such as coal cleaning, the application of fluidized-bed combustion, and flue-gas desulphurization processes, the national emissions of sulphur dioxide are expected to come down to 2.6 million tons by the year 2000, and to 1.1 million tons by 2010.

With aid from abroad flue-gas desulphurization is being installed at several Polish power plants. The annual emissions of sulphur dioxide from the lignite-burning plant at Belchatów, for instance, with a capacity of more than 4000 MW, will soon have been reduced by 60,000 tons as a result of employing Dutch expertise, and a similar plant at Turow (2000 MW) will have had its emissions cut by 85-90 per cent before the turn of the century.

Although the number of motor vehicles is not especially great (only 12 per 100 of population), they cause serious pollution. The annual emissions of 450,000 tons of nitrogen oxides amount to 31 per cent of the country's total emissions.

Three-quarters of the vehicles are Polish made, with heavily polluting engines of ancient design. They are not adapted for lead-free petrol, which explains why so little of that type of fuel is sold (only about 5 per cent of the total).

The environmental authorities are trying to reduce motor traffic in urban areas, to promote public transport, make city centres car-free, and lay out bicycle lanes. Here they would like to have advice from other countries. Although not much has been done so far, there are outstanding examples here and there. One such is the cycle lane that was inaugurated last July in Poznań, the first in a city area. This was the result of cooperation between the Polish Ecological Club at the university of technology in the city and the local authorities.

**MAGNUS ANDERSSON**

Magnus Andersson is a freelance writer specializing on environmental matters and Eastern Europe in particular.

# Seemingly at a crossroad



© ANDRÉ MASLENNIKOV

*"Water polluted. No bathing." Untreated sewage makes much of Estonia's shoreline unfit for bathing.*

WHEN THE Estonian Green Movement emerged in the spring of 1988, it almost immediately gained widespread popularity and thousands of active supporters.

From the beginning people regarded the Green Movement as a political organization, fighting against the Soviet colonialist central power in Moscow, which was insisting that a number of ecologically hazardous projects be carried out in Estonia (such as the opening of new phosphorite and oil-shale mines, the construction of thermal power plants and oil terminals).

Now that Estonia has regained its independence, however, attitudes are changing. Some Greens warned as early as 1988 that if independence were gained, the Greens would be in a difficult position, since people would be wanting to copy the western model – seeking economic

growth, wishing to consume more, and to have a higher standard of living – although there were many who had previously promised to "eat potato peels" if they could live in an independent Estonia. Now these promises seem to have been forgotten.

This compels the conclusion that the supposedly high ecological consciousness of the Estonians had a very particular political basis, lasting only for a certain period, and as such was only a myth.

In fact, things are even more complicated, since the living standard in Estonia is much lower than expected and people's hopes of an improvement are so much higher.

Estonia will soon have to make some principal choices concerning industrial and energy policies.

Being in a very complicated economic situation and therefore having

to choose between almost equally poor alternatives, the country and its leaders are going through a difficult time.

The Estonian Greens also find themselves standing at a crossroad, where none of the options seem to lead in the desired direction. Here are some examples.

Plans to construct a nuclear power plant in Estonia were seriously discussed in the autumn of 1990. In November the government had stated that no such plan would be considered before the year 2000, and naturally, the Greens gave full support to that decision.

But now that the country is forced to cope with an energy crisis (since fuel imports from Russia have diminished to one third of the needed amount), Estonia is compelled to expand oil-shale mining or at least to maintain it at the present level. Oil



shale is the basic solid fuel used in the country's thermal power plants, covering about 50 per cent of requirements.

The problem is that such a policy would mean further aggravating the ecological crisis in northeastern Estonia, where the deposits are situated. Even now, the rate of bronchial diseases caused by chemical wastes in that region is about three times as high as the average in Estonia.

Furthermore, this is where there is the most fertile agricultural land, and it would be destroyed by the new mines. Numerous villages would also be affected.

Even if Estonia were to cut its energy output by half – and cease to sell electricity to Russia and Latvia – the mining area would still need to be expanded, since the thickest mineral layers have already been used up.

It would be some decades before alternative energies could begin to contribute a significant part to the country's total energy output. Even in Denmark, well known for its wide use of alternative energy sources, these contribute only about 5 per cent to the total output.

Possibly the greatest achievements of the Green movement in Estonia was its victory in the "phosphorite war."

In 1988, under the pressure of public opinion and the Greens, Estonian leaders were forced to confront Moscow and abandon plans for the construction of a huge phosphorite mine in north eastern Estonia.

If this plan had been carried out, it would have meant not only a catastrophic aggravation of the environmental situation, but would also have caused major demographic changes, since it would have involved bringing in tens of thousands of workers from Russia. As it is, Estonians constitute only about 65 per cent of the total population.

Nevertheless, a number of articles have recently been published in the Estonian press, discussing the possibilities of opening up new phos-

phorite mines, since this mineral could become a lucrative export article.

The Greens still maintain their position in the matter, but the dilemma remains. Phosphorite exports would bring in considerable

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### *The Estonian Greens will now have to make up their minds*

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amounts of foreign exchange. Or would it be better to take big loans from international monetary funds, and possibly end up in the same situation as Third World countries? Which would be worse?

One of the first demands of the Estonian Greens was that the pulp and paper mill in Tallinn should be shut down, since the plant consumes up to 40 per cent of all the water used in the city, and it is moreover responsible for about one third of the waste.

This demand still remains, although without result, because in August 1990 the Tallinn City Council gave permission to continue the production of pulp, despite the opposing votes of Green representatives.

At that time, all the paper needed for printing books and magazines

had to be imported from Russia, since the pulp produced in the local mills was not suitable for this purpose.

Now, in the spring of 1992, the export of paper from Russia has almost ceased and – as an irony of fate – the pulp and paper factory in Tallinn has started to make print-quality paper. Though the quality is very poor it still enables the publishing of Estonian newspapers, including those that run green articles. Should the Greens then continue to insist that the mill be closed?

These examples show how easy it was for the Greens to be fundamentalist as long as they were opposing a colonialist central power and so maintaining the image of a national liberation movement.

When once a country has again become a sovereign state and the Greens, facing the choices mentioned, continue along the fundamentalist line, the number of supporters tends to decrease and may end up being very limited.

The Estonian Greens are thus at a crossroads, where they will have to make up their minds and decide which of two bad choices is the worse.

MARIO KIVISTIK

Adapted from an article that appeared in **Estonian Life**, April 1992. The author is active in the Estonian Green Movement.



*The mining of oil shale in northeastern Estonia causes extensive pollution of the water and lays waste the landscape. The emissions of air pollutants from burning the shale are also very great.*

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# Coordinated western aid

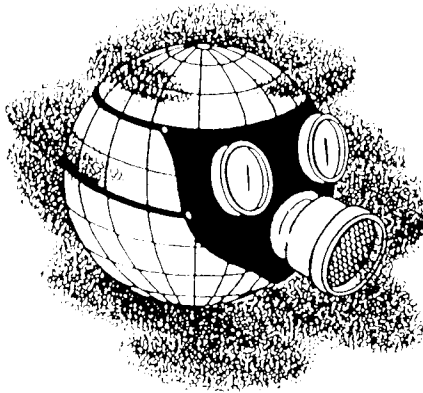
LAST DECEMBER the EC published an updated account of the environmental action that has so far been taken for eastern Europe. The task of coordinating G-24 assistance had been given to the European Commission. The G-24 group includes the Community, EFTA, Turkey, USA, Canada, Japan, Australia, and New Zealand. The overall program of G-24 activity, known as PHARE (Poland/Hungary Aid for Restructuring of Economies), has now been extended to other countries without changing the name.

The report says that an important goal of the PHARE program is to finance a series of critical environmental projects in the East, and these priorities have been identified:

- ☐ Measures to improve and to strengthen the powers and effectiveness of institutions and political actors.
- ☐ Measures to develop training for dealing with environmental problems, as well as information about them and general awareness.
- ☐ The financing of pilot projects, preventative infrastructures, and solutions to serious and pressing environmental problems, through direct investments.
- ☐ Development of a regional program to facilitate cooperation between Eastern European countries in respect of cross-border pollution.

As examples of national PHARE programs may be mentioned:

That for Poland focusing on helping the country to develop an environmental monitoring system and providing funds for projects to re-



duce pollution, improve water quality, preserve nature, and treat waste. It includes the creation of a fund to finance these projects, and provides for participation in a Project Implementation Unit set up by the World Bank. A budget of 30 million ecus has been allocated for a period of 36 months.

Financial support for environmental projects in Czechoslovakia has been allocated as follows: 5m ecus general, 3.5m ecus for energy, 5.8m for waste, 5.9m for water and 5.3m for air. Here the PHARE program for 1991 focused on:

☐ An analysis of the impact of pollution on the health of the population in the industrialized regions of Teplice and Novaky.

☐ The setting up of a program for increased public awareness and education.

☐ The harmonization and reinforcement of methods for the management and control of water quality.

Through the PHARE Regional Facility Program, the Commission is lending support to specific regional programs, with the aim of encouraging Central and East European countries to carry out their reforms in a multilateral context and helping them resolve transborder environmental problems. A budget of 90m ecus, including 20m for the environment, has been approved for the Regional Facility programs for 1991. One so financed is the Sulphur, or Black Triangle, project.

The Black Triangle is a densely populated, heavily industrialized region that includes parts of Poland, Czechoslovakia, and the former GDR. A study will be made of problems affecting the quality of life in the region, as well as their causes and possible solutions. An allocation of 3m ecus has been made for this part of the program.

REINHOLD PAPE

## Conference on the Ecological Reconstruction of Central & Eastern Europe

Environmental issues that are basic for Central and Eastern Europe have already been discussed at various conferences in which NGOs both from East and West have participated, with subsequent agreement on principles. It is felt however that in general NGO viewpoints have had too little effect on political decision-making, and that to improve this situation it will be necessary among other things to strengthen the positions of NGOs in Central and Eastern Europe.

In pursuance of this aim, Global 2000 of Austria is organizing jointly with Friends of the Earth European Coordination, and Greenway, the *Vienna Conference on the Ecological Reconstruction*

*of Central and Eastern Europe, November 15-17, 1992.*

The intention is to develop common strategies for NGOs in key environmental fields. A major objective will be to address the ministerial conference on Environment in Europe that will take place in Switzerland this coming spring, where an Environmental Action Programme for Central and Eastern Europe will be decided upon. The Vienna one will also see the adoption of an East-West Environmental Charter with strategies applying to key issues.

Workshops on November 15 and 16 will consider the prospects for international campaigns on nuclear energy, the environmental aspects of the poli-

cies of the European Bank of Reconstruction and Development, the World Bank, and the European Community, East-West cooperation among NGOs on the international level, as well as the prospects for official East-West initiatives of a positive kind.

The prospects for East-West cooperation among NGOs on energy, nature conservation, transportation, and western investments in Central and Eastern Europe will be dealt with in workshop sessions.

Further information concerning the conference can be obtained from the organizers: Global 2000, Hahngasse 15/14, A-1090 Vienna, Austria, phone: +43-1-310 40 77, fax: +43-1-310 50 23.

# Assessing future emissions

FROM A STUDY made for the EC Commission it appears that the emissions of carbon dioxide from road traffic are likely to go on increasing in the Community up to the year 2000. While the outlook is uncertain as regards nitrogen oxides, the emissions of volatile organic compounds (VOCs), carbon monoxide, and sulphur are expected to diminish.

Road traffic is responsible for a large proportion of the total emissions of air pollutants in the Community. In 1985 motor vehicles gave off 55 per cent of the nitrogen oxides, 54 per cent of the VOCs, and 22 per cent of the carbon dioxide.

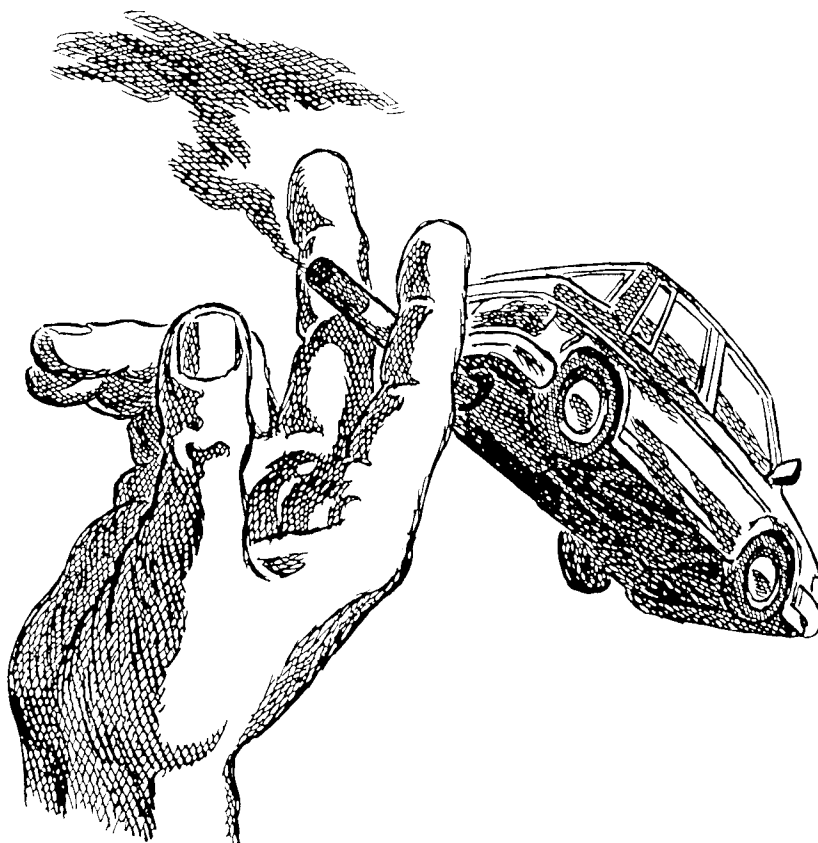
For assessing future emissions the study takes five different scenarios, using various assumptions as to the increase in the number of vehicles, the extent of their use, and fuel consumption, as well as the time for the introduction of emission standards and their effectiveness.

Emission data for 1985 have been taken as the baseline for calculations (see table). Figures are then presented both for the whole Community and the various member countries. There are also separate emission data for the different types of vehicle.

Scenario A is the basic one, in which the number of vehicles has been extrapolated up to the year 2000, according to the trend of the last fifteen years. In this case the number of passenger cars and heavy diesel-driven vehicles may be expected to have increased by 25 per cent by 2000. It is assumed that new vehicles of both types will meet the Community emission requirements coming into force in 1993-96.

Under this scenario the emissions of CO<sub>2</sub> would increase by 25 per cent, while those of NO<sub>x</sub> would decrease, although only by 5 per cent. The emissions of VOCs and CO may be expected to fall by 40 and 45 per cent. As a result of a reduction of the sulphur content of diesel fuel to 0.05 per cent in 1995, the emissions of sulphur from road vehicles should drop by almost 80 per cent.

Scenario B is similar to A, except that it assumes the introduction of emission standards for light-duty



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trucks and motorcycles in 1996, as well as mandatory inspection programs for passenger cars, to ensure that engines and catalytic converters are properly maintained. These measures would lead to somewhat lower emissions compared with Scenario A, except for CO<sub>2</sub>. The emissions of NO<sub>x</sub>, VOCs, and CO would come down by 10, 50, and 65 per cent.

Scenario C, said to represent the use of the best technology, assumes the introduction of stricter emission standards for all types of vehicle in the period between 1996 and 1998. It also assumes changes in petrol

quality to reduce evaporated emissions of VOCs, an overall lowering of fuel consumption by 10-15 per cent as from 1996, and mandatory vehicle-inspection and maintenance programs from 1993.

The result would be a still further reduction of emissions – NO<sub>x</sub> going down by almost 20 per cent, VOCs by 60, and CO by close on 70 per cent. The emissions of CO<sub>2</sub> would still increase, although only by about 5 per cent.

The most pessimistic is Scenario D. Here the number of vehicles on the road would increase, as well as

**Emissions of air pollutants from road traffic in the European Community in 1985 (thousand tons).**

	NO <sub>x</sub>	VOCs	CO	CO <sub>2</sub>	SO <sub>2</sub>
Cars	2,935	5,117	29,799	281,640	83
Heavy vehicles	2,553	360	1,159	123,709	276
Light trucks	660	676	3,433	54,664	49
Two-wheelers	11	434	1,148	6,653	0.4



the vehicle-kilometres driven, by a further 15 per cent, as compared with Scenario A. Changes in urban traffic relative to rural are also assumed, with urban increasing at the expense of rural. This scenario is said to be an attempt to simulate conditions of economic boom, with emission standards corresponding to those of the A scenario. Emissions of CO<sub>2</sub> and NO<sub>x</sub> would increase by 70 and 20 per cent, while those of CO and VOCs would fall by 30 and 15 per cent.

Scenario E is intended to represent a state of economic depression, and as such it is, from the point of view of the environment, the most "optimistic" of them all. Its assumptions are in general the opposite of D – with vehicle numbers and vehicle-kilometres both lower by 15 per cent than in A, and rural traffic increasing and urban declining. Otherwise it corresponds with Scenario A.

Nevertheless the reductions in emissions would not be particularly impressive. The emissions of CO<sub>2</sub> and NO<sub>x</sub> could be expected to decline by 10 and 30 per cent, while those of VOCs and CO would come down by about the same amounts as in Scenario C, in other words by 60 and 70 per cent.

It appears from the various scenarios that it will be difficult to attain any sizeable reduction of emissions merely through the application of technical measures – especially in the case of CO<sub>2</sub> and NO<sub>x</sub>. It is evident, for instance, that assuming an economic boom, the reduction of NO<sub>x</sub> emissions that might be expected as a result of technical improvements in new vehicles would be more than eaten up by traffic increases in almost all countries.

The study notes in fact that the scenario for an economic depression indicates emission reductions that would on the whole be greater than those that can be achieved by technical measures. The most effective way to abate pollution from road traffic would undoubtedly be to reduce the number of vehicles on the roads and to use those that remain still less.

**CHRISTER ÅGREN**

**Forecast of emissions from road traffic in the European communities** by Z.S. Samaras and K.-H. Zierock.

## MOTORWAYS

# Proposal for a huge extension

THE EUROPEAN COMMISSION has announced a massive new road-building program, designed to add up to 12,000 kilometres of new motorways in Europe by the year 2002. It could increase the amount of land covered by motorways by 32 per cent.

The program was announced in June by the transport commissioner, Karel van Miert. The 12,000 km of new motorways will cost 120 billion ecus, and many of them will be built in Greece, Ireland, Portugal, and Spain. Although the Commission has also published documents about improving facilities for combined transport, the money it proposes for this environmentally friendlier form of transport is no more than 2 billion ecus.

In its communication to the Council of Ministers on the trans-European road network (COM92 231), the Commission says that "in drawing up its proposals it particularly took into consideration the recommenda-

tions adopted by ... the Motorway Working Group" made up of road and industry organizations.

The communication also mentions the environment, saying the environmental impact of the trans-European road network "will have to be analyzed specifically." It adds that "roads must play an important role in the community's strategy on controlling CO<sub>2</sub> emissions and the implications for the greenhouse effect." Whether this is a veiled way of saying that building roads improves traffic flow and therefore reduces CO<sub>2</sub> emissions (as some governments still believe) is open to interpretation.

If implemented, the proposal would mean that any new road on the trans-European network could qualify to have around 25 per cent of the cost paid out of Community funds.

Source: **Transport & Environment Bulletin** No. 10, July 1992

## NEW FUEL

# Replaces diesel

PUBLIC TRANSPORT BUSES in Rouen and Grenoble, France, are now running on a mixture of regular diesel fuel and something called diester, in equal proportions. Diester is a new type of fuel derived from rapeseed oil.

To produce it, rapeseed oil is allowed to react with methanol. Unlike untreated rapeseed oil, diester can be used in ordinary diesel engines. This means that imported diesel oil can be replaced by a domestic fuel with better environmental characteristics. Diester contributes less than diesel oil to the greenhouse effect, it gives no emissions of sulphur, and 40 per cent less particulate matter than diesel.

The French trials have aroused great interest, not least from the big oil companies. The future of this new fuel will depend largely on Community agricultural and energy

policy. As a means of encouraging the use of bio-fuels in the transport sector, last February the EC Commission put forward a proposal for taxing such fuels at the most by 10 per cent of the tax on petrol and diesel fuel.

The French have in any case already gone ahead and exempted diester from the duty it would otherwise have to pay as the equivalent of diesel oil. A tax on emissions of carbon dioxide and stricter limits on fuels' sulphur content would favour diester still further. Several environmentalist organizations, including the European Environmental Bureau (EEB), would however like to see a more thorough assessment of the environmental effects before taking a stand on the matter.

Sources: **Europe Environment** June 2, 1992, **Ny Teknik** No. 18, 1992

## Catalyzers making converts in four cities

FOUR COUNTRIES in the Far East have taken a first step towards combating air pollution in their cities, which are becoming increasingly congested with cars. Singapore, Taiwan, Thailand, and Malaysia have passed laws making catalytic converters compulsory on new cars, and there are signs that Indonesia and China may follow suit.

Environmental groups argue that with the exception of Singapore, a city-state with vigorous controls over the number of cars allowed on the road, this step will do little to prevent further deterioration of air quality in cities where a rapid growth is projected in the number of vehicles.

A study in Bangkok in 1990 suggested more than 900,000 of the city's seven million inhabitants suffered chronic respiratory problems and other illnesses caused by air pollution.

In May, the World Bank's 1992 World Development Report said: "Estimates for Bangkok suggest that the average child has lost four or more IQ points by the age of seven because of elevated exposure to lead ... in adults the consequences include risks of higher blood pressure and higher risks of heart attack, strokes, and death."

The region is the fastest-growing market for cars, with Thailand and Indonesia at the top of the league. Sales in Thailand grew 30 per cent a year between 1988 and 1991 and there are now more than two million vehicles in the capital.

At best the laws will maintain a bad situation, said Mike Dunne, a consultant on southeast Asia for the car industry. The most effective way to improve air quality would be to limit the number of new registrations. "They do it in Singapore but it is unlikely to happen in other countries," said Dunne.

PAUL HUNT

Article in the **New Scientist** July 11, 1992

## Heightening stringency

THE OWNERS of some half-million trucks, buses, and taxis in Mexico city will either have to convert their vehicles for alternative fuels or buy new ones with catalyzers, according to a plan made public on February 11 by President Carlos Salinas de Gortari. These vehicles are responsible for about 40 per cent of the air pollution in the Mexican capital.

The Mexican plan goes even further than that recently put forward for Los Angeles by the South Coast Air Quality Management District, requiring about a third of the trucks and 20 per cent of the city's buses to be using alternative fuels by the year 2010.

The situation in Mexico City is however much worse than that in Los Angeles. In the former, for instance, in 1991 unacceptable levels were registered for ozone, particu-

lates, and carbon monoxide on 354 of the year's 365 days.

The measure concerning Mexico City is the last in the series passed by the municipality and the federal government in an effort to reduce air pollution in the capital, which has 18 million inhabitants and is surrounded by mountains that trap the polluted air during periods of inversion.

Federal laws have already reduced the lead content of petrol and caused urban buses to be equipped with catalyzers. As a further measure to reduce air pollution, which is especially bad in winter, people are obliged to let their cars stay standing on at least one day of the week.

Sources: **L.A. Times**, February 12, 1992, **The News Mexico**, January 23, 1992



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RESEARCHER

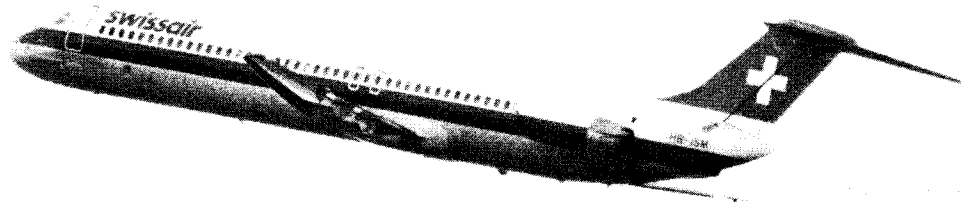
## Politicians out of step

MANY POLITICIANS and decision makers are underestimating the willingness of the European public to favour environmentally sound transportation, according to the German mobility researcher Werner Brög. Brög's work, which was funded by the European Community, shows that 59 per cent of

Europeans feel the impact of road traffic is no longer acceptable, 71 per cent believe banning cars from city centres would be effective, and 85 per cent would take the pedestrian's side in a conflict between pedestrians and cars.

Source: **Transport & Environment Bulletin** No. 10, 1992

# Polluting planes top the greenhouse league



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AIRCRAFT contribute eight times as much to the greenhouse effect as cars, and twenty-two times as much as electric inter-city trains, according to the latest figures from the Energy Technology Support Unit (ETSU), which is based at Harwell. This unit has been reworking the figures of greenhouse-gas emissions published by the Intergovernmental Panel on Climate Change in 1990.

The unit calculates that, for every seat, an aircraft produces 684 grams of carbon dioxide, or its equivalent, for every kilometre it travels. A car produces 83 grams per seat and fast electric trains, such as the French *trains à grande vitesse*, 31 grams.

One of the main worries for aircraft manufacturers is the amount of nitrogen oxides which planes produce at their cruising altitude of 10 to 12 kilometres. The ETSU calculates the greenhouse effect of gases over a 50-year period. Nitrogen dioxide breaks down in a photochemical reaction to form ozone, a greenhouse gas. At ground level 1 gram of nitrogen dioxide has three times as potent a greenhouse effect as the same amount of carbon dioxide. But in the upper atmosphere emissions of nitrogen dioxide have 335 times the ground-level effect.

Laurie Michaelis of the ETSU's strategic studies department says

that the main reason why nitrogen dioxide has such a disproportionately powerful effect in the upper atmosphere is that the air is cooler. The cool air slows up the chemical reactions and the greenhouse effect of relatively short-lived gases like ozone is consequently enhanced.

Emissions of nitrogen oxides are responsible for about two-thirds of an aircraft's production of greenhouse gases. Emissions of carbon dioxide are responsible for the rest. The ETSU calculates that ozone has the greatest effect on the earth's temperature at 12 kilometres above the surface of the planet, which is close to the cruising height of most airliners.

So although aircraft probably produce no more than 3 per cent of Europe's emissions of nitrogen oxides, they probably contribute as much to global warming as all the other emissions of nitrogen oxides put together. The problem is compounded by the rapid growth of air travel. The number of aeroplanes using British airports has doubled in the past 20 years.

Rolls-Royce, one of the world's leading manufacturers of airplane engines, said that the effects of emission of nitrogen oxides in the stratosphere were poorly understood, but confirmed that its re-

searchers were trying to reduce these emissions. In aeroengines the bulk of nitrogen oxides are produced above 1700°C. Rolls-Royce is working on an engine which will burn fuel in several stages, reducing the engine temperature while maintaining its efficiency.

Barrie Moss, head of propulsion, power, and automotive engineering at the Cranfield Institute of Technology in Bedfordshire, says that designers went for high pressure and high temperatures to improve fuel efficiency. These designs reduced emissions of carbon dioxide but at the expense of increasing emissions of nitrogen oxides.

He adds that while a "lean burn" engine would reduce emissions of both greenhouse gases, this could affect safety, making engines more difficult to restart in the cold air 10 kilometres up.

Any change in the design of aeroengines would take time for development – present-generation aeroengines are based on designs produced in the 1970s – and "a large amount of investment," says Moss.

MICK HAMER

Article in the **New Scientist**, July 25, 1992

# Even for small projects

SOLAR CELLS ARE NOW approaching the levels of efficiency and cost that will be necessary if they are to be winners in the near future, reports the Swedish Solar Energy Society in its current yearbook. The Society regularly issues yearbooks and other publications relating to the development of solar energy in Sweden and elsewhere, and describing pilot projects.

As an example, in Falkenberg on the Swedish west coast there is Europe's second largest solar station for the production of heat from sunlight, which been in operation since 1990.

The solar panel field has high-efficiency solar panels, each measuring 12.5 m<sup>2</sup>. A well isolated steel tank with a volume of 1100 cubic metres that is connected to the field is filled with water, which on some sunny days may become heated almost to boiling point. The tank acts as an accumulator, so that all the households in the town that are connected to the district-heating system can get solar-heated water for showers, baths, and dishwashing even after the sun has gone down. In summer there will be heat enough for several days even when the weather is cloudy.

The Falkenberg installation at present supplies almost 10 per cent of the annual heat requirement for the district system. It meets the entire need for hot water during summertime as well as contributing to space heating during spring and autumn.

Despite the northerly latitude, with low temperatures and considerable cloudiness, solar heating is proving viable in Sweden even for small apartment-house projects. During the last five years about 4000 sq metres of solar panel have replaced the ordinary south-facing roofing. The solar panels usually act in combination with a conventional boiler to heat the water in a cistern. The hot (tap) water system does not differ from the normal, and the space heating may either be by radiators, coils under the flooring, or hot air.

As at Falkenberg, the solar system is used primarily to heat tap



*The solar panel field in Falkenberg supplies almost 10 per cent of the annual heat requirement for the city's district heating system.*

© SVEN ANGERMARK

water, being scaled to provide the greater part of summer needs. In spring and autumn it also contributes to space heating.

In general it may be said that solar heating is most efficient when only used to heat tap water. But then it only contributes about 10 per cent of the total heating need. A greater proportion, 30-40 per cent, can be obtained in a well-insulated building if the solar heat is used both for hot water and space heating, although this means lower efficiency.

There are considered to be good possibilities for building solar heating systems in residential areas with 20 to 400 households when these are connected to a common seasonal heat-storage tank which could provide around 70 per cent of total heating needs during the year.

But there is one problem with solar heating according to the Swedish Solar Energy Society. While the running costs are relatively low, it is very expensive to install a system. In a long-term perspective the heating costs from solar plants are not higher than those from other energy sources, but nearly all the cost is in the investment, which is beyond the means of local housing authorities.

Any large-scale build-up of solar heating in market conditions will therefore call for some method of financing that will spread the costs over the lifetime of a solar station as in the case of other, competing energy sources.

**REINHOLD PAPE**

For more information about Swedish solar heating projects contact: **Svenska solenergiföreningen**, c/o SERC, Box 10044, S-781 10 Borlänge, Sweden.

# Clean coal technology

THE United States' Department of Energy (DoE) has released a report outlining the progress of its Clean Coal Technology Program (CCTP). The CCTP is a government-industry partnership initiated in 1986 by a Congressional directive to expand the use of domestic coal. The focus of the program has been on the development of coal-burning technology that will comply with current requirements for the reduction of acid rain.

The DoE selects projects of promising commercial value and funds up to fifty per cent of their cost. The CCTP is intended to reduce the initial financial risk required to demonstrate the technical reliability and economic feasibility of full-scale, first-of-a-kind ventures. Currently the DoE is funding forty-two CCT projects in twenty states with a total outlay of \$4.6 billion.

Some CCT projects are exploring high-efficiency generating plants for electricity that will rely on coal gasification. In the coal-gasification process, coal is broken apart by a reaction with steam and oxygen. This reaction produces a mixture of carbon monoxide and hydrogen. The

mixture drives a combustion turbine-generator to produce electricity. Sulphur in the coal is released as hydrogen sulphide (H<sub>2</sub>S) gas. This gas is put through a purification process to extract the sulphur. As a consequence, almost 99 per cent of the sulphur is eliminated from the fuel gas. The sulphur can then be used to meet various industrial needs.

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*Gasification technologies  
virtually eliminate major  
pollutants associated  
with acid rain*

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According to the U.S. Secretary of Energy, James D. Watkins, "Many of the (coal-gasification) technologies virtually eliminate the major pollutants commonly associated with acid rain, while several offer the dual benefits of superior environmental performance coupled with more efficient, lower cost generation." Gasification can use several different raw materials. The Shell Oil Company has successfully gasified eighteen different fuelstocks, including bituminous coal, subbituminous coal, lignite, and petroleum coke.

ERIC WILKINSON

Research Associate, the Pacific Energy and Resources Center of Sausalito, California, USA.

## Selling emissions

UNDER the 1990 Clean Air Act, utilities and industries that reduce their emissions below federal requirements accumulate credits for each ton of emissions they have saved from polluting the atmosphere. They may sell these credits to other industries that exceed federal levels.

The first of such sales was announced on May 12, 1992. The Tennessee Valley Authority (TVA) bought the rights to emit 10,000 tons of regulated pollutants from the Wisconsin Power and Light

Company. The Wisconsin utility was able to reduce its emissions well below the federal requirements. The price of the sale was not disclosed but it is believed to be between \$2.5 and \$3 million.

The credits will allow the TVA more time to decide which option will be best for them – either installing a smokestack scrubber or switching to a cleaner-burning coal – to meet the Clean Air Act's emissions standards.

ERIC WILKINSON

## Publications

### Paradise deferred: Environmental policymaking in Central and Eastern Europe (1992)

By Duncan Fisher. In central and eastern Europe in the winter of 1989-90 no political program could afford not to declare a commitment to improving the severely damaged environment. In 1992 however the political process is throwing up barriers against the integration of environmental policy into economic development. There is no lack of good will, but the intentions of policy documents and environmental legislation are less evident in the economic sectors where they must be implemented.

£10.00. 80pp. Obtainable from Energy & Environmental Programme, Royal Institute of International Affairs, Chatham House, 10 St James's Square, London, England SW1Y 4LE.

### Emerging energy technologies – impacts and policy implications (1992)

Edited by Michael Grubb and John Walker. This book underscores the potential role of technological change in the face of growing pressures, and the importance of anticipating it. Supply technologies that could emerge into energy markets during the next decade are examined in four case studies, as are also four on the demand side. It is argued that presently emerging technologies could have a profound impact on the energy business.

£29.50. 250pp. Can be ordered from the RIIA, as above.

### The environment in international relations (1992)

By Caroline Thomas. The fate of environmental problems in international relations is illustrated in three case studies: global warming, ozone depletion, and deforestation. Each examines the way the problem has arisen, where the responsibility lies, and the international efforts that have been made to address it. Entrenched interests within and between countries are said to be shaping priorities as regards both the problems and their solution, and it is questioned whether interest can everywhere be sustained.

£12.50 (paperback), £25.00 (hardback). 300pp. Available from the RIIA, as above.

### The acid rain effect (1992)

By Philip Neal. A well illustrated and easily readable survey of the causes and effects of acidification. Suitable for use in schools.

64pp. Published by Batsford Ltd, 4 Fitzhardinge Street, London, England W1H 0AH.

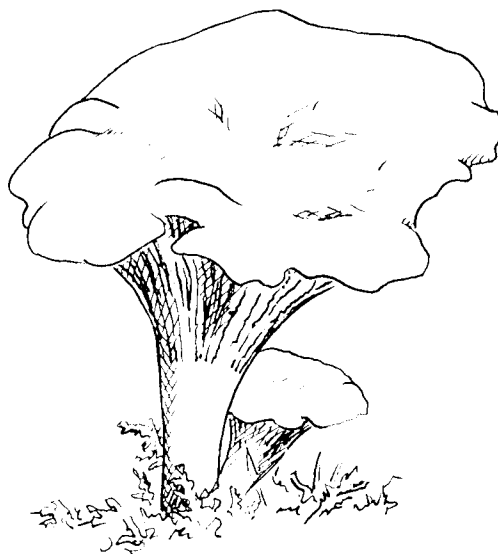


# Also victims of pollution

EUROPE'S FUNGI are disappearing. From chef-prized chanterelles to lethal death caps, more than 1000 species of large fungi (known as macrofungi) are on the decline, some being completely wiped out in areas where they were once common.

According to the European Council for the Conservation of Fungi (ECCF), established in 1985 to monitor macrofungi in representative forests throughout Europe, more than 80 per cent of fungus species in some families are seriously threatened. Eleven countries have recorded declining fungi numbers. In Saarland, former West Germany's most populated region, 50 per cent of the macrofungi are regarded as endangered and an additional 13 per cent seem to have disappeared completely.

Some people associate fungi with death and decay, growing like lesions on dead logs. Many of the toadstools that dot European forest paths are however not parasites at all and have a different lifestyle. Their hyphae – the fine threads that



penetrate deep into whatever the fungus is feeding on – have a symbiotic relationship with the roots of trees and other plants. These mycorrhizal fungi obtain carbon from the plants, and in return supply their partners with water and nutrients. Many European trees cannot grow healthily without their fungal associates.

The big decrease in mycorrhizal fungi indicates that whole ecosys-

tems, and especially forests, are in bad shape.

The ECCF points to air pollution as the likely cause of the fungi's woes. Mycorrhizal fungi are sensitive to acidification and to an increased amount of nutrients, especially nitrogen. Nitric and sulphuric acids are by-products of the burning of fossil fuels. Ammonia, another nitrogen-containing gas, is emitted by dung from livestock. In the Netherlands this is the biggest source of eutrophication – the process whereby nutrients choke lakes and ponds, depleting their

oxygen and killing all life.

The decline is one more sign of the attack of atmospheric pollution on Europe's forests. Fungi fatalities prove that it is not just trees that are dying – entire forest ecosystems are threatened.

ALAN HAMILTON

Article in **WWF News** No. 3, 1992. Alan Hamilton is Plants Conservation Officer for WWF International.

## Climate change...

*Continued from page 16*

wait and Iran, the oil-producing countries also played an unhelpful and often obstructive role. Many delegates at the INC believed that the OPEC countries did not wish to have a convention at all. Other fossil-fuel interests, particularly the coal industry, acting through the World Coal Institute and the US-based Climate Council, played a leading role at the negotiations in spreading misinformation about the greenhouse issue.

Whilst the twelve EC countries, as well as Finland, Austria, Sweden, Switzerland, Australia, New Zealand, Japan, and Canada, maintained their commitment to the stabilization target, none was prepared to have a convention that was not signed by the United States. The USA is the world's largest emitter of greenhouse gases, and would also be the largest single source of funds for any UN-directed program to reduce

the growth of greenhouse-gas emissions in developing countries.

## What is the next step

"The scenarios show that more far-reaching efforts are required than are now being contemplated in order to achieve a major reduction in the rate of carbon dioxide increase in the atmosphere."

– Extract from a report to the Fifth Session of the INC/FCCC by Professor Bert Bolin, chairman of the Intergovernmental Panel on Climate Change, February 20, 1992.

There can be little doubt that the state of scientific understanding is such as to require much more stringent action to reduce the emissions of greenhouse-gases than is demanded by this convention. The next steps must therefore be to ensure that:

□ The convention enters into force as soon as possible. Fifty ratifications (as opposed to simple signatures) are needed for it to do so.

□ There will be "prompt start" or interim arrangements to begin work on implementing the convention before it formally enters into force. The INC has adopted some such measures, of a very general nature, in essence involving a meeting before the UN General Assembly receives a report from the INC late in 1992.

□ Re-affirmation of commitments to the stabilization of domestic emissions and/or reduction targets and timetables in all the industrialized countries (except the US). The early and aggressive adoption of the measures aimed at stabilizing greenhouse-gas emissions from these countries would provide a powerful signal, consolidating the political message from Articles 4.2(a) and (b) of the Convention: that the US must join the consensus of the industrialized countries.

BILL HARE

From a report written in May 1992, after the last INC meeting, as a part of the activities of the Climate Action Network.

# Further publications

## Changing course (1992)

In this book the Business Council for Sustainable Development, led by a Swiss industrialist, Stephan Schmidheiny, proposes radical changes in business practice, integrating development needs with environmental issues, and forging new partnerships between government and industry ... "to overcome the inertia of the present destructive course." Hailed by James Gustave Speth, president of World Resources Institute, as "nothing less than a road map to the corporate future."

£9.95 (paperback) £19.95 (hardback). 397pp. Published by The MIT Press, 14 Bloomsbury Square, London, England WC1A 2LP.

## Atmospheric pollution – a global problem (1992)

By Derek M. Elsom. Second edition. A fundamental, up-to-date presentation of the problems of atmospheric pollution, its causes and effects, and the various approaches for its control.

£45.00 (hardback) £14.95 (paperback). 420pp. Available from Blackwell Publishers, 108 Cowley Road, Oxford, England OX4 1JF.

## Procedures for enhancing the use of environmentally friendly vehicles (1992)

English summary of a report by Gunnar Eriksson, published by the Swedish Transport Research Board. Describes the possibilities of decreasing the environmental effects of road traffic by introducing alternative fuels and vehicles, with proposals for measures to stimulate such a development.

TFB Report 1992:7. 8pp. (Full report in Swedish only). Available from the Transport Research Board, Birger Jarls torg 5, S-111 28 Stockholm, Sweden.

## Energy without end (1992)

The very scale of the environmental damage due to the use of fossil fuels and nuclear power will enforce a switch to less polluting, renewable sources of energy. In this book Friends of the Earth show how the United Kingdom could start to meet this challenge.

£7.95. Available from Friends of the Earth, Publications Despatch, 26-28 Underwood Street, London, England N1 7JQ.

## NGO directory for Central and Eastern Europe (1992)

Compiled and edited by Alexander Juras. The first edition of a directory listing more than 1000 non-governmental organizations in the field of environmental protection.

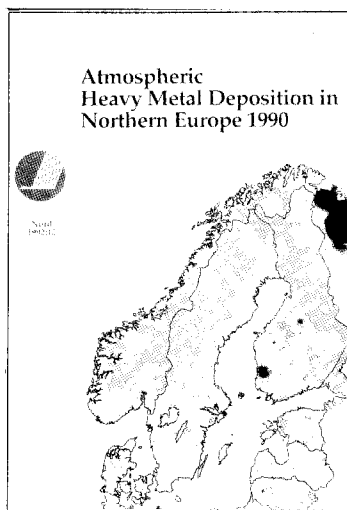
DM40 (special terms for Central and East Europeans). 712pp. Can be ordered

from the publisher: Institut für Europäische Umweltpolitik, Aloys-Schulte-Str. 6, D-5300 Bonn 1, Germany.

## Climate Action Network: International NGO directory (1992)

Gives addresses and brief presentations of the NGOs that are occupied worldwide with matters concerning climate.

102pp. Free of charge. Published by Climate Network Europe, 44 rue du Taciturne, B-1040 Brussels, Belgium.



## Atmospheric heavy metal deposition in northern Europe 1990 (1992)

Editor Åke Rühling. The airborne depositions of heavy metals in Scandinavia (including Finland), the Baltic States, and adjacent areas of Russia are shown in the form of coloured contour maps.

Nord 1992:12. 138 kronor. 50pp. Published by Nordic Council of Ministers. Available from Allmänna förlaget, S-106 47 Stockholm, Sweden.

## Energi för Europa – resurser, ekonomi och samarbete (1991)

Report from a Nordic Council seminar on a proposal for all-European cooperation on energy, in a European Energy Charter. Contains background information, accounts of the debates, and the final document.

84pp. In Swedish only. Available from Allmänna förlaget, S-106 47 Stockholm, Sweden.

## The right climate for carbon taxes: Creating economic incentives to protect the atmosphere (1992)

A World Resources Institute report by Roger C. Dower and Mary Beth Zimmerman. It recommends the use of carbon taxes as a key component to meet the long-term objectives of the new climate treaty. According to the authors a carbon tax can reduce the emissions at substantially less cost than any of the alternative means.

Available from the WRI, 1709 New York Avenue, N.W., Washington D.C. 20006, USA.

## Convention on climate change: Economic aspects of negotiations (1992)

Report from the OECD examining some important questions for the national implementation of the framework convention on climate change, signed in Rio this year. Among other things it considers the ways in which international transfers of resources can influence overall participation, and how the "free rider" problem can be minimized.

£13.00. 98pp. Published by OECD, 2 rue André Pascal, F-75775 Paris cedex 16, France.

## Global warming – the benefits of emission abatement (1992)

So far little emphasis has been given to the benefits of policies for combating global warming. This report by William R. Cline describes a framework for such an assessment, and suggests some preliminary values for the key elements of that framework.

£8.50. 70pp. Obtainable from the OECD, address as above.

## Climate change: Science, impacts and policy (1991)

Proceedings of the second world climate conference, held in Geneva in October-November 1990. Edited by J. Jäger and H.L. Ferguson.

£50.00 (hardback), £24.95 (paperback). 578pp. Published by Cambridge University Press, The Pitt Building, Trumpington Street, Cambridge, England CB2 1RP.

## Climate change 1992

This report is a supplement to the 1990 report of the Scientific Assessment Working Group of the Intergovernmental Panel on Climate Change (IPCC). Reviews, in the light of new evidence, the key conclusions of the 1990 Report, "Climate Change – the IPCC Scientific Assessment."

196pp. Also published by Cambridge University Press, address as above.

## Confronting climate change – Risks, implications and responses (1992)

Edited by Irving M. Mintzer, Stockholm Environment Institute. Written by a group of scientists, political analysts and economists, in an attempt to answer these questions: What do we know so far about the foreseeable dangers of climate change? How reliable is our knowledge? What are the most rewarding ways to respond?

382pp. Published by Cambridge University Press, address as above.

# Muddling along

AS FINALLY AGREED, the United Nations Framework Convention on Climate Change falls far short of the expectations held by the international community. It had been expected that the industrialized countries would, as a minimum,

□ Agree to stabilize their emissions of carbon dioxide and other greenhouse gases at 1990 levels by the year 2000, and

□ Provide developing countries with substantial new financial resources to enable the transfer of technologies that would limit the growth of emissions from those countries.

But the outcome was only a confused commitment by industrialized countries to "bring emissions back to earlier levels." This reflects the attitude of the United States in refusing to agree to the stabilization target.

Apart from commitments in regard to emissions, the convention deals with a complex set of interlocking commitments, provisions, and institutional arrangements. Although not as detailed as would have been desirable, the structure of the convention will nevertheless enable it to be an organic, changing tool for leveraging the global community into stronger action.

Throughout the negotiations the tensions between the developed and the developing countries were a constant source of difficulties. The final convention text represents a subtle balance between the commitments made by industrialized countries, on emissions, finance, technology transfer, and other issues, and those of the developing countries. Owing to the weak commitments from developed countries, the developing ones, led principally by India and China, engaged on a strong last minute push to qualify all the commitments that they had undertaken.

The convention text is replete with caveats, qualifications, and provisions for "special circumstan-

ces" (such as fossil-fuel dependency, Article 4.10) which provide a very high degree of flexibility. From an environmental aspect much of this flexibility is undesirable, since it provides too many potential escape clauses. Proponents of the many flexibility provisions would argue that these were necessary to ensure that the convention would have the widest possible support.

One of the key positive elements in the convention is the objective, Article 2, establishing a powerful ecological goal for the convention. This states in part that the "ultimate objective" is the "stabilization of greenhouse-gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." More importantly the objective states that this should be achieved "within a timeframe sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner."

Although the initial commitments fall far short of the measures needed to meet this objective, the convention does provide a framework for the development of stronger measures, including the reduction of

emissions through subsequent negotiations.

Here, however, there is a strong caveat. International treaties sometimes take several years to enter into force owing to the time countries take to go through the internal formalities for enabling them to join. Australia for example took more than twelve months to formally join the Montreal Protocol on ozone depleting substances. It is imperative that the international momentum be kept up in order to develop further commitments on emissions and technical mat-

ters before the convention formally enters into force. Recognizing this, many countries at the negotiations were supporting the idea of a "prompt start" on work to implement the convention.

## What went wrong

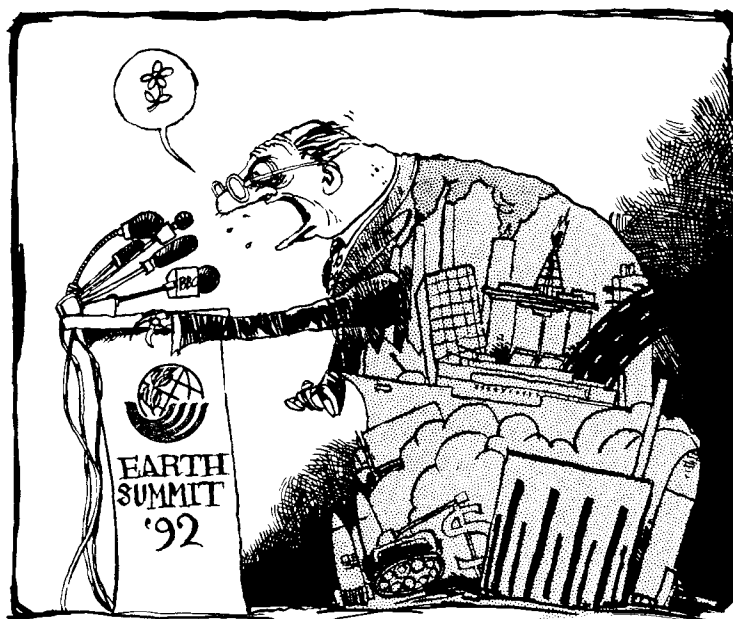
"We are creating a baby, and babies are not born with teeth."

— Statement by the Saudi Arabian delegate to the final plenary of the International Negotiation Committee (INC), Part I, February 28, 1992, at the United Nations in New York.

The United States remained intransigent in regard to specific emission commitments, refusing to allow any reference to targets and timetables for emission controls. This meant that the OECD, or the industrialized countries as a group, were unable to agree on specific commitments, in particular those for stabilization of the emissions of CO<sub>2</sub> and other greenhouse-gases at 1990 levels by 2000. Despite the firm scientific reports from the Intergovernmental Panel on Climate Change, the US obstinately maintained that there were too many uncertainties.

Led by the Saudi Arabian delegation and supported notably by Ku-

*Continued on page 14*



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