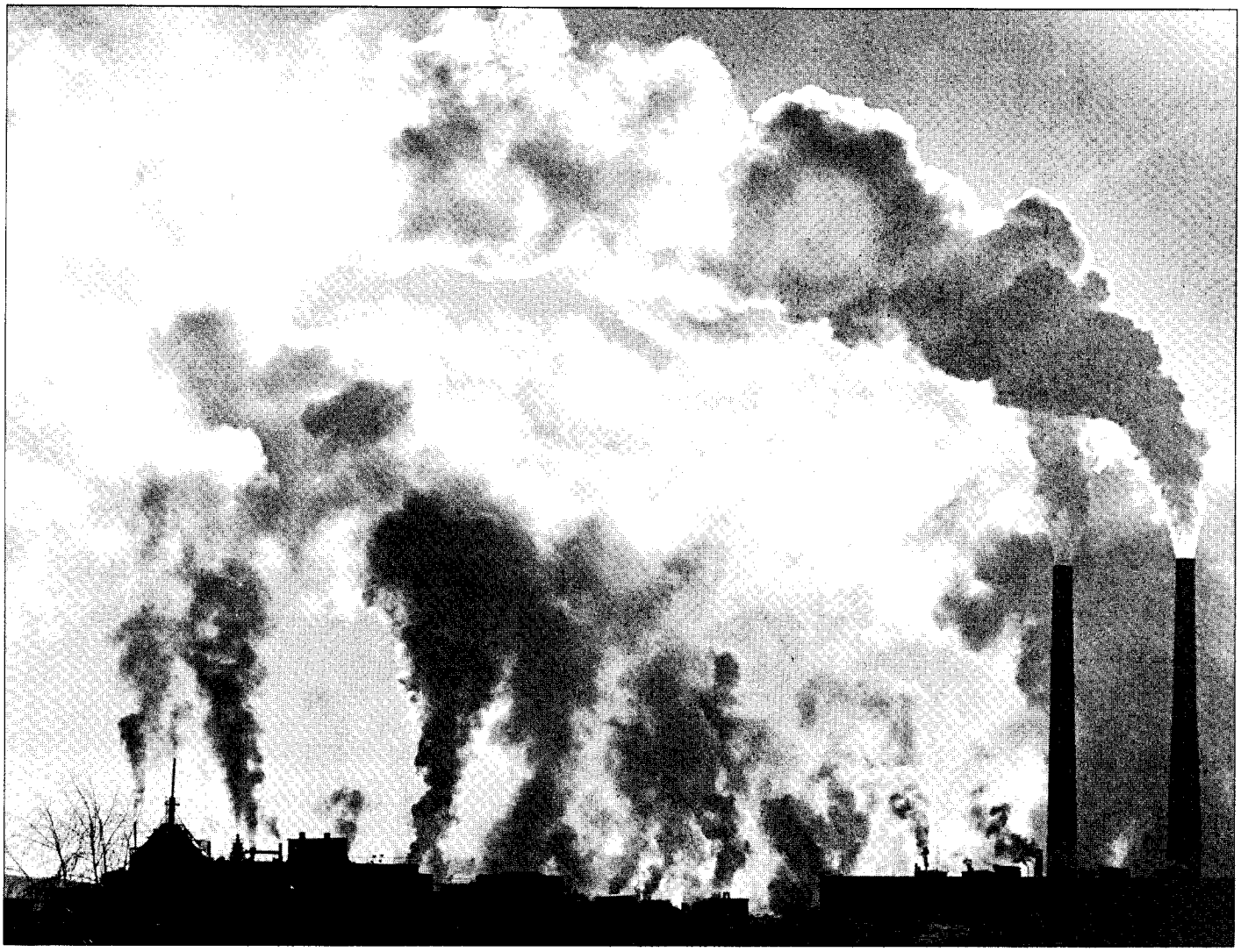
NO. 3, JUNE 1994

Acid News



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EMISSIONS

The worst hundred sources

IN EUROPE, a greater part of the emissions of sulphur dioxide comes from a relatively small number of point sources, the hundred largest being responsible for almost half of the total. This has come to light as a result of a study* commissioned by the Secretariat.

The sources are of four kinds: power stations, industrial plants, oil refineries, and district heating plants. Since there was no data base covering all these activities, for the purposes of the study a variety of information sources had to be drawn upon in order to pinpoint the sources and estimate their emissions. Among the means employed were questionnaires to utilities and government institutions.

The study has not only revealed the hundred worst polluters, but also enabled a data base to be built up, containing information on altogether one thousand point sources. A special map has also been produced to show the location of the hundred heaviest emitters.

It appears that between 80 and 90 per cent of the man-made emissions of sulphur in Europe come from the thousand largest point sources, while the hundred worst ones are alone responsible for 42 per cent of the total. Of these hundred, ninety-five are power stations, the rest consisting of three smelters, one refinery, and a blast furnace producing pig iron. The hundred have been tabled both in order of the size of their emission and according to the country of their location. The twenty-five worst emitters are listed in the table at the end (p. 3).

Since the ninety-five power stations are all fired with fossil fuel, estimates have also been made of

Continued on page 3

Acid News

is a newsletter from the Swedish NGO Secretariat on Acid Rain, 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 secretariat. All requests for information or material will be dealt with to the best of our ability. Acid News is distributed free of charge.

In order to fullfill 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 SECRETARIAT

The Swedish NGO Secretariat on Acid Rain was formed in 1982 with a board now comprising one representative from each of the following organizations: The Environmental Federation, the Swedish Anglers' National Association, the Swedish Society for Nature Conservation, the Swedish Youth Association for Environmental Studies and Conservation, and the World Wide Fund for Nature Sweden.

The essential aim of the secretariat is to promote awareness of the problems associated with air pollution, and thus, in part as a result of public pressure, to bring about the required reduction of the emissions of air pollutants. The eventual aim is to have those emissions brought down to levels – the so-called critical loads – that the environment can tolerate without suffering damage.

In furtherance of these aims, the secretariat operates as follows, by

- ☐ Keeping under observation political trends and scientific developments.
- ☐ Acting as an information centre, primarily for European environmentalist organizations, but also for the media, authorities, and researchers.
- ☐ Producing and distributing information material.
- ☐ Supporting environmentalist bodies in other countries by various means, both financial and other, in their work towards common ends.
- ☐ Acting as coordinator of the international activities, including lobbying, of European environmentalist organizations, as for instance in connection with the meetings of the bodies responsible for international conventions, such as the United Nations Convention on Long Range Transboundary Air Pollution.
- ☐ Acting as an observer at the proceedings involving international agreements for reducing the emissions of greenhouse gases.

EDITORIAL

Facing up to it

WHAT DOES IT COST to reduce the emissions of air pollutants? Or not to do it?

Reasonably enough, there is an increasing call for environmental measures to be as cost-effective as possible. This usually means that the preferred steps are those that yield the greatest return (in terms of the amount of the emissions or the environmental damage that can be avoided) in relation to the size of the investment. Proposals for reducing emissions are therefore now usually accompanied by estimates of the cost. Otherwise special interests, such as the power industry, will quickly provide the decision-makers with their view of the matter.

The estimates are not infrequently exaggerated. For one thing they are based on information from those very interests, who have no particular desire to be smitten by demands for reduction. For another, the easiest, and often the only, possible way of estimating the cost is to assume the use of end-of-pipe technology. It is easy to calculate the cost, for instance, of equipping a coal-fired power station for flue-gas desulphurization, since there are plenty of completed projects to go by.

It is unfortunately much more difficult to calculate the costs when they concern a reduction of the emissions of one or more pollutants through structural measures, such as switching the fuel, using energy more efficiently, curbing traffic, or the application of new technical solutions. This is doubly unfortunate, seeing that structural measures are often superior, both environmentally and economically, to the use of end-of-pipe technology.

In scenarios for emission trends, on which strategies are based, the potential for a reduction will consequently often be underestimated, while the cost is exaggerated. This results in the sights for environmental improvement being set far too low.

Then, too, evaluation of the gains from reduction – in terms of quantity and quality – is still rare. So is estimation and evaluation of the damage attributable to the emissions of pollutants. But such information is essential for judging the usefulness of any proposed measure, and it should always be taken into consideration when deciding on any particular measure or long-term strategy.

There are several reasons why such evaluations are rare. One in particular is that much of the damage from air pollution is difficult (some would say impossible) to determine in any clear way in economic terms. Examples are effects leading to impoverishment of flora and fauna, or the increased human suffering from respiratory diseases and cancer.

A further aspect of the problem is the difficulty of determining how much of any form of damage is attributable to some particular pollutant. The effects are often a result of a combined action of several factors, both natural and anthropogenic, where air pollutants constitute only one component.

When resources are limited it is all the more important, despite the difficulty, to try and obtain this sort of information. It is needed to provide a counterweight to the specific, but often exaggerated, information as to the cost, as well as to bolster – although not replace – ecological arguments. It is also needed to help internalize the social costs arising from any form of activity (cf AN 2/94, pp. 6-7). And finally it is needed as a means of judging both cost-effectiveness and the direct and indirect gains from various strategies.

To try and evaluate nature, the environment, and human health in economic terms is naturally not easy. On the other hand the effort to do so may lead to better cooperation between ecologists-biologists, engineers and economists – a cross-fertilization of sciences that could well turn out to be fruitful.

CHRISTER ÅGREN

USA

Attack on VOCs and NOx

THE OZONE TRANSPORT COMMISSION, which was formed under the US Clean Air Act and includes states from Maine to Virginia in the north-eastern part of the United States, is proceeding with a variety of strategies which could substantially lower emissions both of volatile organic compounds and nitrogen oxides. Foremost among the strategies that are being considered are the Californian Low Emissions Vehicle Standards. Two of the states, New York and Massachusetts, have already adopted the Californian program and have been locked in litigation with the car industry over the issue.

In February, by a vote of 9-4, the commission approved sending a petition to the Environmental Protection Agency to have the agency mandate the California program for all member states. The EPA now has nine months to evaluate the petition and make a decision as to whether to mandate the program for all the states. The two EPA officials on hand for the vote have both indicated that they will study the recommendation as well as alternatives.

The vote is a serious blow to the car industry, which has long opposed the California program in the Northeast. Virginia, New Jersey, Delaware, and New Hampshire were the four states that opposed the plan. The states voting in favour were Connecticut, District of Columbia, Maine, Maryland, Massachusetts, New York, Pennsylvania, Rhode Island, and Vermont. States have the right to petition the EPA, and the EPA has the right to mandate the programs under Section 184(c) of the Clean Air Act.

Among the methods for the reduction of emissions that are likely to be adopted by the commission are scrappage programs that remove the oldest, most heavy-polluting vehicles from the roads, and "ride-share" programs at businesses. The commission is also considering placing a "cap" on regional emissions of nitrogen oxides and developing a credit trading scheme.

Source: **Car Lines**, February 1994.

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CAT CARS

Not good enough

THE EXHAUSTS of catalyzer-equipped cars that have been on the roads for some years are not as clean as they should be. Half of the models that have been tested in Sweden failed to meet the national standards.

Since the autumn of 1991 tests for emissions of carbon oxide, hydrocarbons, and nitrogen oxides have been carried out on 117 cars with twenty-seven standard engine types. The evaporation of hydrocarbons was also measured. The test results were depressing. Thirteen of the twenty-seven engine types failed in one respect or another, and some as regards more than one of the pollutants. And in the case of vehicles, four out of ten fell down on emission requirements.

It was mostly the limits for emission of carbon oxide that were exceeded, with eight of the twenty-seven engine types failing in this respect. The evaporation of hydrocarbons was also too high from seven of the car models, and the concentrations of this pollutant in the exhaust gases were too high in three models. On the other hand all met the emission requirements for nitrogen oxides.

It is clearly the cars of some makes that were at fault. Cars from Ford, Citroën, and Peugeot repeatedly failed to come up to standards, while there was no trouble with Volkswagens, Mazdas, Toyotas, and Renaults.

An officer of the Environmental Protection Agency is critical of manufacturers' claims that their cars have zero emissions, or at least a 90-per-cent exhaust-cleaning effect, since tests show quite clearly that they do not. In comparison with non-catalyzer cars there is more likely to be a 60-70 per cent reduction.

The agency also emphasizes the importance of durability requirements for the catalyzer, and control of their being maintained – as required by law in Sweden and the United States, but not in the European Union. In the United States and Sweden car makers must also guarantee proper functioning of the exhaust-cleaning system after at least five years or 80,000 kilometres of driving. A compulsory warranty is thought to provide a strong incentive for manufacturers to equip their cars with durable systems.

Source: **Miljöaktuellt**, March 23, 1994.

Still no change

EUROPEAN EMISSIONS of nitrogen oxides show no sign of diminishing. According to the latest data from EMEP,* garnered from national reports, between 1980 and 1992 they changed only negligibly, from 22 to 22.4 million tons.

It is now about six years since the so-called NOx protocol to the UN ECE Convention on Long Range Transboundary Air Pollution came into being. So far it has been signed or ratified by twenty-seven countries.

By accepting the protocol, countries agree to freeze their emissions of nitrogen oxides – in other words, to ensure that after 1994 they will not exceed 1987 levels. Twelve of those that signed have however given expression to their displeasure at the weakness of the protocol by issuing a joint declaration saying that they all intended to reduce their emissions by about 30 per cent by 1998, in comparison with any year they chose to select between 1980 and 1986.

The figures in the table represent emission data reported by the countries themselves to the ECE (UN Economic Commission for Europe). From them it appears that several countries may have difficulty in meeting even that modest commitment to freeze emissions. This applies for instance to Belgium, France, Ireland, and Spain, where emissions have increased by 10 per cent or more since 1987.

Among the twelve countries that committed themselves to reducing emissions by about 30 per cent by 1998, there are evidently several that will find it difficult to do so – at least if one assumes no changes in their environmental policies. From talks with the environmental authorities in most of these twelve countries, it turns out that only Switzerland, the Netherlands, Germany, Austria, and Denmark feel fairly certain of being able to attain the goal for reduction.

In Sweden the Environmental Protection Agency has just concluded that given the present regulations and the forecast development of road traffic, nitrogen-oxide emissions will have fallen by 27 per cent between 1980 and 2000. In other words, Sweden will also fall short of the set mark. Recently, too, Torbjørn Berntsen, Norwegian minister of the environment, admitted that his country would not succeed either (AN 2/93, p. 3). And there seems to be great uncertainty in the remaining four countries – Finland, France, Italy, and Liechtenstein.

Several countries may have difficulty in meeting the commitment even to freeze emissions

In judging the trend, one has however to know how reliable and comparable the data from the various countries is. From the EMEP report it appears that very many of them do not even fulfill the requirements of the Convention for reporting, and some have supplied no data at all. Moreover the emissions from some sources, such as ferries plying in territorial waters and offshore installations, have usually not been included.

The next business of the Convention will be to produce a new protocol as a successor to the present one. There seems to be a widespread sentiment in favour of making it cover, besides nitrogen oxides, ammonia and volatile organic compounds (primarily in order to contain the formation of photochemical oxidants). This make it all the more urgent to develop common methods for estimating emissions, and to get countries to improve their reporting.

Apart from the matter of the reliability of the data, there are evidently great weaknesses in the policies of most of the countries as regards the reduction of nitrogen-oxide emissions. The finding of suitable measures for reduction should therefore be given high priority. For this it will however be absolutely necessary to have a clear picture of the size of the emissions and their sources, as well as which measures can come within the range of possibility – and preferably, too, what they will cost.

CHRISTER ÅGREN

*EMEP – European Monitoring and Evaluation Programme.

Emissions of nitrogen oxides, expressed as 000 tons NO_2.

Country	1980	1987	1992
Austria**	246	234	201
Belarus*	244	287	-
Belgium**	442	297	374
Bulgaria*	-	416	240
Canada*	1959	1982	1848
Czech Republic*	937	816	698
Denmark**	273	305	310[1]
Finland**	264	270	286[1]
France**	1823	1630	1810[1]
Germany**	3640	2680	3140[1]
Greece*	-	-	-
Hungary*	273	276	211
Ireland*	73	115	125
Italy**	1480	1700	-
Liechtenstein**	0.7	-	0.6[2]
Luxembourg*	23	-	-
Netherlands**	548	559	550
Norway**	186	236	217
Poland*	-	1530	1130
Portugal	166	116	211[2]
Romania	-	-	-
Russian Fed.*	1734	2353	2326
Slovakia*	-	-	224
Slovenia	43	58	46
Spain*	950	892	980[2]
Sweden**	4242	434	385
Switzerland**	196	200	161
Ukraine*	-	1095	830
United Kingdom*	2365	2603	2747[1]
United States*	23560	19030	18760[1]

* Have signed and/or ratified the 1988 NOx protocol.
** Have signed both protocol and declaration.
[1] Emission data for 1991. [2] Emission data for 1990.

What actually makes fish die

THAT FISH DISAPPEAR as a result of the acidification of fresh waters is a well-known fact. But the chemical, physiological, and biological processes that cause disappearance are still being investigated. The real cause of death to free-swimming fish is, according to two Norwegian scientists,* most probably the sum of a variety of chemical disturbances, of which the concentrations of hydrogen ions, aluminium, and calcium are considered to be most important.

They note that acidity *per se* – that is, high concentrations of hydrogen ions alone – is only rarely the most important factor causing the decline of fish in acidic waters, aluminium now being recognized as the principal toxicant.

The organs primarily affected are superficial sensory organs and the gills. While effects on the olfactory and taste organs are likely to cause behavioural disturbances, for example by affecting the ability to migrate, escape, or search for food, effects on the gills may be more generally detrimental.

In acidified water, aluminium occurs in a variety of chemical forms, some of which are most toxic for fish. Precipitated aluminium complexes can irritate the gill, causing inflammation, swelling, etc., which in turn may negatively affect the functioning of membranes, enzymes, and metabolism. The consequence in most cases is a failure of osmoregulation, that is, in the ability of the fish to maintain the ion balance necessary for survival. Effects on the osmoregulatory process have in turn been found to cause major disturbance at nearly all levels of the fish's life processes.

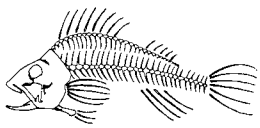
It has been shown that both chronic and episodic changes in water quality are of importance. There will, especially during episodes of high water flow, and in lakes and streams where there is a mixing of different water qualities, be large variations in the chemical composition of the water. In such mixing zones, inorganic forms of aluminium can be transformed from forms with low to others with high molecular weight (complexes), and thus precipitate. The water in the mixing zone may then become more toxic than the original (acidic) water.

The toxicity so created is time-dependent, controlled by the time needed for various chemical reactions as well as by the kinetics of the reactions. For such reactions, the final pH value (i.e. between 6 and 7) is of minor importance. Misinterpretations may thus occur if one judges a specific episode of fish-kill on a basis of stable water samples only, since these would not take into account the previous state of non-equilibrium.

These processes of chemical transformation being dependent on temperature, at lower temperatures longer time will be needed for the water to become detoxified. In the case of streams and rivers this is of ecological importance, since seasonal variations in temperature may cause alterations in the affected areas.

For inland fish populations, that is, fish living exclusively in fresh water, reproduction failure is recognized as the main cause of extinction as a result of acidification.

There are indications that the ability to fertilize and produce viable eggs is reduced in waters with high acidity. After fertilization, the embryo seems to be susceptible to acidity



throughout its whole period of development, although the periods shortly after fertilization and prior to hatching seem to be the most critical. It has been demonstrated that the toxic effects at the egg stage are due both to high acidity and to aluminium. After hatching, however, the negative influence of aluminium will increase with age.

As regards fish that migrate between fresh and salt water, the situation is more complex, the effects possibly being greater in the older stages of life. While the smolt stage is generally considered to be the most sensitive, especially for Atlantic salmon, spawning fish have also been shown to have a low tolerance to acidification and its resulting chemical changes.

At the early stage in the life of a salmon, while still living in fresh water, the young fish are called parr. At a certain stage parr turn into smolt, thus starting to prepare for life in the marine environment. During this short smolting period, the gills gradually change into those of a marine fish, and at this stage the fish become extremely sensitive to stress by hydrogen ions (acidity) and various chemical complexes of aluminium (resulting indirectly from the acidification of the water).

On returning from the sea to spawn in fresh waters, adult fish have gills that are adapted to seawater, which renders them equally vulnerable to acid and aluminium stress. In laboratory experiments, effects have been demonstrated on smolt of Atlantic salmon when exposed to acidic water, such as inhibition of enzyme activity in the gills, failure of regulation of the ion balance, and a complete loss of seawater tolerance.

In natural conditions, fish might be able to avoid the factors causing environmental stress, primarily by escaping. This ability could, however, be affected for instance by the initial shock effects of high acidity, or it could be overridden by the urge to spawn.

The possibilities for escape are greater in lakes than in rivers, since the water retention time in lakes is longer and there are better opportunities for finding refuge areas. Accordingly, mass fishkills have primarily occurred in rivers and brooks, which are also more easily affected by episodes and "mixing-zone" water qualities. River-dwelling species as well as whole stocks have very restricted possibilities of escape, and are consequently especially vulnerable to acidification.

CHRISTER ÅGREN

***Physiological mechanisms for toxic effects and resistance to acidic water: An ecophysiological and ecotoxicological approach.** By B.O. Rosseland and M. Staurnes. Article published in *Acidification of freshwater ecosystems: Implications for the future* (1994). Published by John Wiley & Sons Ltd.

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Found high in many Alpine lakes

ALTHOUGH THE ACID DEPOSITION is relatively small in the Alps, lakes in that region have nevertheless been shown to be substantially acidified. Historic evidence, based on paleolimnological studies of some alpine lakes, has shown an increase in acidity of about 0.8 pH units since the beginning of this century.

In order to quantify the influence of acid deposition, and to estimate critical-load limits, scientists from Italy, Switzerland, and Austria have studied more than 400 lakes in the Central Alps. The lakes most sensitive to acid deposition are those lying in watersheds containing exclusively acidic rocks, such as granite, gneiss, and quartzite. Of the lakes studied, 206 were in such surroundings.

It was found that 4 per cent of these lakes had a pH value of less than 5.3, thus being classified as severely acidified. Here, toxic effects are induced both by the low pH (high acidity) and high levels of aluminium. Furthermore, 18 per cent had pH values lower than 6.0, a value below which pronounced effects on microorganisms, zooplankton, benthos, and fish often occur.

To maintain pH values above the critical level of 6.0, lakes would need an alkalinity level of at least 20 microequivalents per litre (μeq/l). Alkalinity is a measure of the lakes' ability to neutralize – to resist acidification. The critical level below which serious effects of acidification can occur does not, however, refer to mean alkalinity throughout the year, but to the minimum value reached during periods of heavy runoff, such as at snowmelt or during summer rainfall. At present, to avoid the effects of acid surges, mean alkalinity during most of the year needs to be at least 50 μeq/l. According to calculations, such a level of alkalinity was however not present in all the lakes even before the onset of anthropogenic acid deposition.

When calculating critical loads for acid deposition, it was found that some Alpine lakes are so sensitive that any acid load at all might have a negative effect on the organisms living in them. Restoring such lakes would necessitate a complete elimination of atmospheric acid pollution.

Scenarios on emission reductions showed that a reduction in sulphur deposition of 50 per cent would result in 12 per cent of the lakes still having an alkalinity below 20 μeq/l. A similar reduction in nitrogen deposition, on the other hand, would leave as much as one quarter of the lakes with too low alkalinity.

CHRISTER ÅGREN

Source: **Evaluation of the level of acidification and the critical loads for Alpine lakes.** By a Marchetto et. al. Article published in AMBIO, Vol. 23, No. 2, March 1994.

BRIEFS

Roots damaged

Acidification of the soil can cause the disappearance of some plant species. A scientist at Lunds University has let three common species from a South Swedish beechwood grow in a solution similar to that found in sour woodland soil. The solution was allowed to flow continuously past the roots so as to prevent them protecting themselves by raising the pH value of the surrounding soil. The experiments showed how an acid environment (low pH) will by itself damage plant roots. The roots become shorter and more brittle, and come to have contorted ends – thus making them more sensitive to drought and causing their ability to take up nutrients to be reduced. It was also shown that aluminium, which gets leached out of soil with a low pH value, is toxic to the roots to a much greater extent than had previously been supposed.

Svenska Dagbladet, February 21, 1994

US windpower

With proper encouragement from the federal authorities, the United States could have 10,000 MW of new windpower capacity by the year 2000, in the view of the American Wind Energy Association. That would give an electric output equal to that of ten large nuclear plants. Even if no subsidy should be forthcoming, an addition of 5000 MW can be expected within the same period.

Although electricity from windmills is still somewhat more expensive than that generated in plants fired with fossil fuels, the price is steadily coming down, so that it may be as low as 4 cents/kWh by 2000 – making it comparable with or even lower than power from conventional sources. The prevailing higher cost is due to the financial institutions having doubts about this new method of producing electricity, and consequently charging higher interest on loans. There have however been good results from windpower during the last few years, and several new projects have been announced.

Energimagasinet, No. 6, 1993.

"Green" tires

The world's largest tire manufacturer, France-based Michelin, has launched an entirely new type of tire for cars, said to have a 20-per-cent lower rolling resistance than the present kinds. A new rubber mixture, combined with a new pattern of tread, has made it possible to reduce rolling resistance without impairing other properties, especially road holding. The lower rolling resistance will, according to the makers, also reduce fuel consumption by about 5 per cent.

Svenska Dagbladet, February 21, 1994

AUSTRIA

Transit agreement criticized

AUSTRIA and the EU have arrived at a new transit agreement, which has however been heavily criticized by environmental groups.

The agreement, finished right on the deadline for the completion of negotiations for Austria, Finland, Norway, and Sweden to join the EU, involves:

☐ A decision to let Austria's 38-ton axle-weight limit for trucks remain unchanged. Austria has however agreed not to fine operators who exceed the limit by no more than five per cent (which effectively gives a new limit of 39.9 tons).

☐ The complete liberalization of bilateral journeys by the start of 1997.

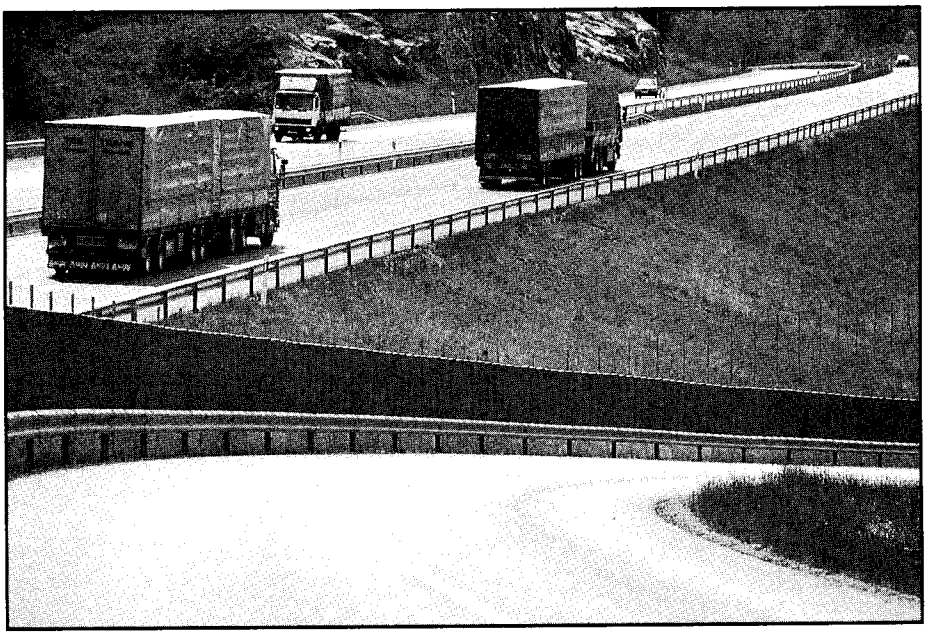
☐ Austria giving up its "road contribution" system for a "road tax" system which conforms to EU rules.

T&E's Austrian member organization *Verkehrsclub Österreich* is so annoyed at the new deal that it has called for an Austrian Alpine initiative along the same lines as the Swiss. A VCÖ statement said: "The new transit agreement means in practice the end of environmental arguments and criteria in future transport policy," and it called for the Swiss model, with all transit goods traffic going by rail by 2004, to be applied in Austria.

The VCÖ also said Austria would lose seven million ecus per year in lost revenue from the five per cent axle-weight tolerance, and that the decision to abandon the "road contribution" system ended "all attempts at making the polluter pay." Another pressure group said taxes on heavy goods vehicles would fall by more than 75 per cent a year under the new deal, and that transit and long-distance traffic in Austria would double in the next ten years. It also said the agreement violated decisions taken at national, regional and local government levels.

The agreement removed the last obstacle preventing Austria from joining the EU, but that still had to be ratified by the referendum that was to take place in June.

Source: **T&E Bulletin**, March 1994.



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SWITZERLAND

A bold step taken

THE SWISS are taking EU's environmental policies more seriously than the EU itself is doing. In a remarkable referendum in February, a majority of the voters decided that:

☐ Goods traffic in transit now going by road through Switzerland and the Alps must go by rail by 2004. Imports and exports will not be affected.

☐ Transit-related motorway construction must be stopped, and present capacity must not be increased.

☐ Switzerland's fixed tax on heavy goods traffic, which came into effect in 1985, will be extended until 2004 and then replaced with a tax proportionate to such traffic using Swiss roads.

Officials and ministers of the EU reacted calmly in public to the vote, but many were said to be privately furious. One of the main forces behind the *Alpen-Initative,* the source of the line accepted in the referendum, was the *Verkehrsclub der Schweiz,* and David Asséo of that organization has commented on the EU reactions as follows:

"Transferring long-distance goods traffic from road to rail and making transport pay its full costs are two of the EU's own principles. Switzerland shares these principles and has just approved the means to convert them into reality by voting in favour of the Alpine Initiative. Unfortunately, though not surprisingly, there is no lack of people who are trying to see the Swiss vote as anti-European.

"The Swiss government is spending at least Ecu 20 billion expanding its rail infrastructure, including the building of two new base tunnels through the Alps with a total of 97 kilometres of new double-track railway. The reason for this is that Switzerland wants to play its role as a transit country, but a rail transit country, not a road transit one. Work already in progress to improve the Swiss rail network means that from this year Switzerland can offer a rail capacity of 30 million tons, and when the new Alpine tunnels are finished, that capacity will go up to 70 million tons.

"The Alpine Initiative vote involves three things: working towards a shift from road to rail, making transport pay its full costs, and implementing both these policies gradually (over ten years). All three are principles that the EU agrees with, and yet we hear of ministers, commissioners, and civil servants being furious with the vote. The EU should be welcoming the Swiss decision as a bold step towards the transport of the future. It seems the Swiss are taking the EU's environmental policies seriously, even if the EU itself is not."

PER ELVINGSON

Source: **T&E Bulletin**, March 1994. See also AN 2/94, p. 8.

Motorways, more motorways

ALL SEEMS SET for a great expansion of the motorway network in Central and Eastern Europe – with a threefold increase in total length planned for the next 10-20 years in Poland, Slovakia, the Czech Republic, and Hungary.

Poland is aiming for the biggest increase. In July 1993 the government put forward a program for extending the length of the country's motorways from the present 280 kilometres to 2000 kilometres in the course of fifteen years. Outstanding projects include completion of:

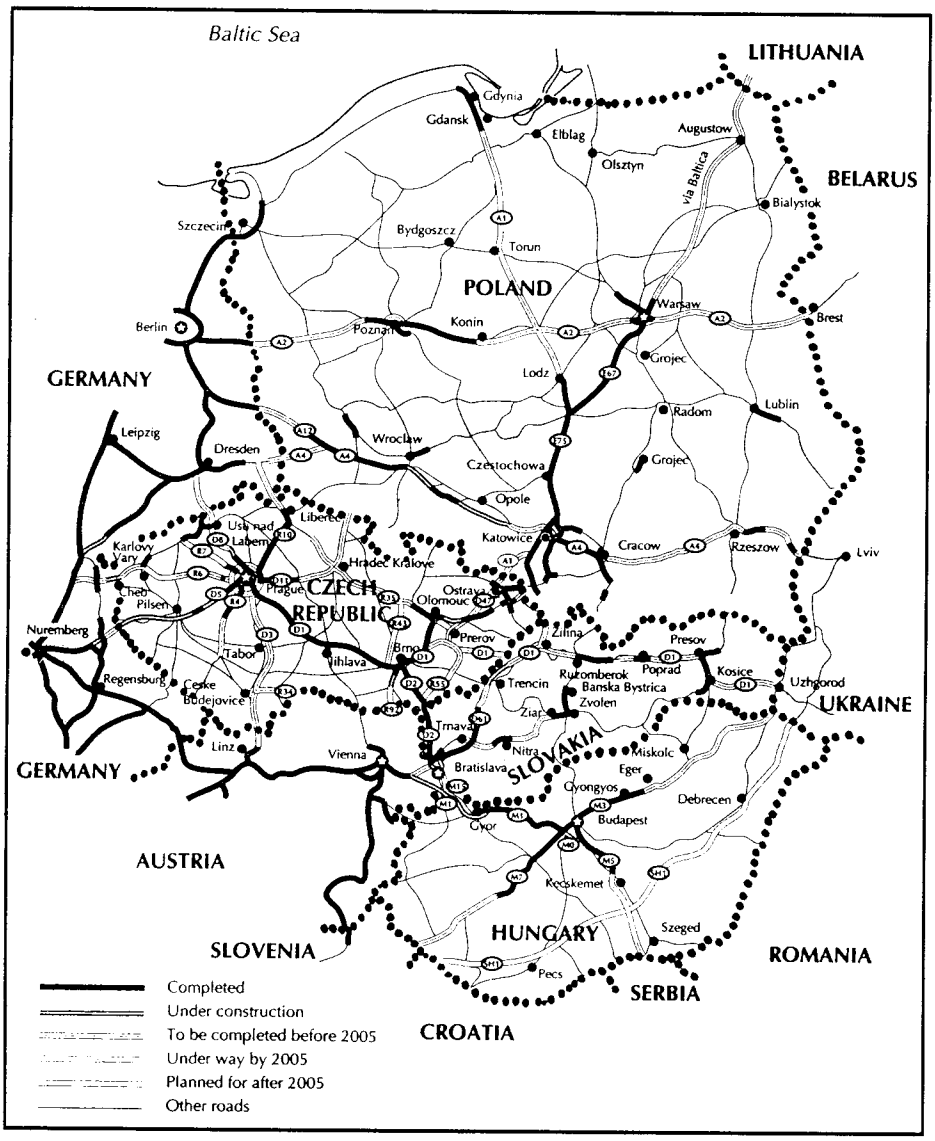
☐ The A1 from Gdansk on the Baltic coast to the Czech frontier.

☐ A2 from Germany by way of Warsaw to the Belarus border.

☐ A4 from Germany to the Ukraine via Cracow.

The country with the most developed motorway system so far is the Czech Republic, with a present length of 400 kilometres, to which the government is intending to add another 800 kilometres by 2005. Motorway construction is to be financed in the main through charges on vehicles using the roads – US$14 for cars, and $30 for trucks.

Hungary is aiming to have added 500 kilometres of motorway to the present network by the year 2000, with new construction linking Budapest with the Austrian system by 1995. Among projects given special priority has been the M0 route south of the capital. Now completed, it has been financed by the European Bank of Reconstruction and Development and the World Bank.



MAP: RFE/RL RESEARCH REPORT NO. 2, 1994.

Civil war in the former Yugoslavia caused heavy traffic between western and southeastern Europe to be redirected so as to pass through the centre of Budapest, with consequent jams and deterioration of the quality of air in the capital. With the completion of the M0, traffic can bypass Budapest.

Slovakia is hoping to build 300 kilometres of new motorway, including a link to connect Bratislava with Vienna, which is meant to be ready in a year or so.

There is an intention after 2005 to build the rest of a 700-kilometre-long motorway leading from Slovenia through Hungary to the Ukraine. Italian interests are said to be involved in the project, as a means of facilitating the movement of freight from Italy to Russia as well as the Ukraine.

Another giant project that is being aired is a Via Baltic, running from Estonia through Latvia, Lithuania, and Kaliningrad to Warsaw. The cost has been calculated to lie between US$0.6 and 1.3 billion. The proposal has met with enthusiastic support from the Finnish government, which sees a great advantage for Finland in a new highway along the eastern side of the Baltic Sea. Environmentalists in the Baltic States do not however share this enthusiasm.

One reason for all these plans for extension of the motorway network is the surge of traffic in Central and Eastern Europe. In Warsaw alone the number of cars doubled between 1991 and 1992, and imports of second-hand cars from the West are significant in all the countries of this region.

There is an obvious risk that concentration on the construction of motorways will encourage the use of private cars for passenger transportation and trucks for freight at the expense of more environmentally benign modes such as railways, buses, and water transport.

MAGNUS ANDERSSON

The writer is a member of the Institute for East European Studies, Uppsala University.

Sources: The **RFE/RL Research Report No. 2, 1994,** was among the sources drawn on for this article. (Radio Free Europe/Radio Liberty, München, Germany.)

Improvement hobbled

A STRONG ELEMENT in the East European countries' "quiet revolution" was anxiety about the environment. Much of the resistance to the former regimes in these countries was in fact driven on by environmental concern. The hope was that by bringing in a democratic system of government, combined with a free market economy, the problems of the environment could be solved.

The question is now whether the situation has in any way changed since the joyful overturn in 1989. Roger Manser, author of *The squandered dividend – The free market and the environment in eastern Europe*, thinks not. In some respects, he says, it has actually become worse.

DECIN, CZECH REPUBLIC. © PER ELVINGSON

The aim of this well written and informative book is, according to the author, to describe and analyze the way the economy has affected the environment, both in the prerevolutionary period and even more so today, when Central and East Europe is moving into a mixed or capitalist economy and a democratic system of government.

Manser does not see any immediate hope of a free market economy leading to environmental improvement, putting forward three main reasons: the failure of economic restructuring, the shortage of funds for environmental investments, and the lack of public support for firm environmental legislation.

He cites a number of cases where action had been expected, but failed to materialize. Already in 1989, for instance, it had been decided in roundtable conference between the communist government and the Solidarity opposition, that the worst industrial polluters in Poland were to be shut down. A list was compiled of eighty plants whose emissions were of national importance, to which the voivodship (provincial) authorities added 800 more that were considered to be among the worst polluters in their localities.

On coming into power the new government stated in its national plan for the environment that all the eighty plants were either to be closed or forced to clean up. But little has since been done. A few plants have certainly been shut down, although probably more for economic reasons than out of consideration for the environment. Some have been allowed – or given themselves – a respite of several years. But by the time of the publication of Manser's book, in 1993, nothing had yet been decided as to what should be done about most of the plants on the government's list.

Budget constraints one of the main reasons

The emissions of pollutants to air and water did diminish between 1989 and 1991 – according to official figures by 20 to 25 per cent. But this improvement is ascribable mainly to the general worldwide recession, rather than to any definite measures such as changed legislation. The downward trend will therefore probably be only temporary, and will be reversed when industrial activity increases.

Manser would like to see a more generous attitude on the part of the Western nations, pointing to budget constraints as one of the main reasons why it has not been possible for the eastern countries to do anything about their worst polluters. He notes that except in eastern Germany, the sum of available funds from government sources and the enterprises concerned, as well as from foreign investors and aid agencies, has been quite insufficient for environmental needs.

According to Manser's estimates, in the early nineties the external aid allocated for environmental recovery in eastern Europe added up to approximately US$3 billion. Since most of the loans were not expected to be disbursed before the mid-1990s, the actual contribution from the international community in the early 1990s has probably been less than $1 billion a year, whereas domestically generated finance accounted for 85-90 per cent of the total environmental expenditure in the region.

These sums need to be set against what is actually required for investment in environmental recovery – estimated to be in the region of $600 billion for the next twenty years.

Changes in lifestyle and imports of consumer goods from the West are

reported to have given rise to new environmental threats, such as more waste, including wastes of a hazardous kind brought in from abroad, and increased emissions of air pollutants from motor vehicles.

Manser has coined the term "sustainable restructuring" – meaning a restructuring of economic activity so as not to adversely affect the ecological system. The necessary policies would, he says, include setting the prices of raw materials so as to cover the full costs of exploiting non-renewable resources, and putting the "polluter pays" principle into practice.

But as long as the wealthier nations persist in their policy of unsustainability, the chances of the eastern European countries being able, more or less on their own, to develop in an ecologically sustainable manner will naturally be very small.

CHRISTER ÅGREN

The Squandered Dividend – The free market and the environment in eastern Europe. By Roger Manser. 196 pp. £11.95. Published by Earthscan Publications, 120 Pentonville Road, London, England N1 9JN.

CHINA – JAPAN

Treaty on acid rain

CHINA AND JAPAN have agreed to sign a bilateral treaty for environmental protection. This is the first time that China has referred, in a treaty draft, to the air pollution and acid rain affecting the country's 1.3 billion population.

Over the past few years, Japan has been wooing China to join it in its efforts to clean up the East Asian skies that are becoming increasingly polluted by acid rain, which is causing ecological damage to forests in Japan and on the Korean Peninsula. Last year the Electric Power Research Institute, an affiliate of the Japanese utility companies, pointed out that the acid rain observed in Japan was predominantly caused by coal-burning power plants on the Chinese coast, and for the past two years Japan has been urging the Chinese to install desulphurization equipment at those very plants. Early this year the institute made an agreement with China to experiment with a cheaper version of such equipment, which would otherwise cost no less than US$100 million per plant.

China already has signed environmental treaties with South Korea, India, and Canada, and the China-Japan treaty is expected to be signed next year.

Source: **Car Lines**, February 1994.

EU PARLIAMENT

Cleaner transport

THE EUROPEAN Parliament's transport and tourism committee has produced a report on transportation and energy in which it puts forward a number of strong recommendations. The report, compiled by the French Green MEP Marie Dinguirard, aims to reduce the consumption of oil for transport purposes by 20 per cent by 2000 and 50 per cent by 2010. It urges:

☐ A reduction of the speed limits on European motorways to no more than 120 km/h by 1995 (with no increases in countries where they are already lower).

☐ A progressive tax on vehicles with high energy consumption, and a degressive tax on those with low energy consumption, by 1997. (Vehicles using less than 3 litres/100 km to be exempt from 2000).

☐ Support for hybrid vehicles using traditional and renewable fuels, and for car-sharing projects.

☐ A Sunday ban on car use.

☐ A tax on kerosene for the aviation sector by 2000.

☐ Keeping the current maximum axle-weight for trucks at 40 tons.

☐ Insisting on the "polluter pays" principle.

These recommendations were all approved by the committee.

Source: **T&E Bulletin**, March 1994.

BRIEFS

Saving electricty

Many TV owners, instead of switching their sets off, leave them on stand-by mode around the clock. When on stand-by, the TV is operated by distant control, which is convenient but consumes a lot of electricity. While it is true that a single set only requires 10 watt when on stand-by, if that is multiplied by 20 hours a day and the whole total of TVs in use, the result is a considerable amount of electricity. In Britain, with at least 20 million TV sets, energy equivalent to 1500 tons of coal may thus be wasted every day.

Now however a Finnish company, Nokia, has succeeded in lowering the power needs of TVs on stand-by mode by a factor of 100. But sets that lack this refinement should naturally still be switched off in the normal way – both to save money and reduce the load to the environment.

New Scientist, September 11, 1993.

Electric motors

British businesses could save nearly £200 million in the next decade with just a 3-per-cent increase in the efficiency of the country's electric motors. And the improved designs could reduce the emissions of carbon dioxide from power plants by 4.5 million tons over the same period, says the government's Energy Efficiency Office. Britain emits about 150 million tons of carbon dioxide a year.

The more efficient electric motors have been developed by British engineers, in part by using advanced computer modelling. Simple induction motors in industry and households consume 43 per cent of the electricity used in Britain, so even small gains in efficiency promise substantial cuts in the country's electricity bill.

New Scientist, March 19, 1994.

French highway plans

Members of French environmentalist groups are expressing outrage at the decision to spend 140 billion francs over the next ten years on highway construction projects throughout the country. The plan include some 3000 kilometres of new highways and will help complete the government's long-standing objective of providing the country with more than 12,000 kilometres of high-speed roads.

Prime Minister Balladur said the move would help to promote economic development and reduce unemployment. But environmentalist groups said the construction will do irreparable harm to the French environment while having little effect on the economy.

Car Lines, February 1994.

BRIEFS

Swedes into Poland

Western power companies are turning their attention more and more to Poland. The Swedish state-owned Vattenfall is for instance already engaged in four projects there, including one for modernization of the power station at Patnow, to be carried out jointly with the Finnish Imatran Voimas company. The intention is that after completion the plant shall be owned and operated by the two, together with Polish or other foreign interests.

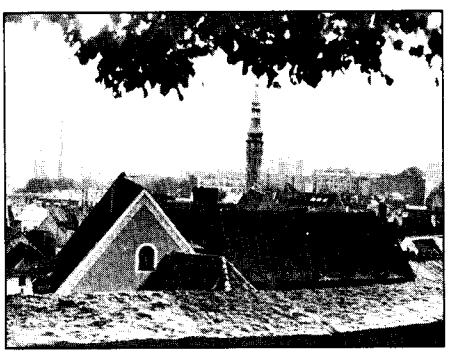
Many Polish power stations are so run down as to require extensive modernization – especially in view of the new, more stringent environmental regulations that will be coming into force in 1998. The estimated cost in each case will lie between US$300 and 500 million.

Svenska Dagbladet, February 23, 1994.

Coal firing opposed

The environmentalist organization Greenpeace has gone to court in Australia to test the sustainability of the UN Climate Convention. Last April it challenged a decision to build a 100 MW coal-fired power plant in Hunter Valley, 150 kilometres north of Sydney. Under the Climate Convention the signatory states, among which is Australia, have committed themselves to freezing and eventually reducing their emissions of greenhouse gases.

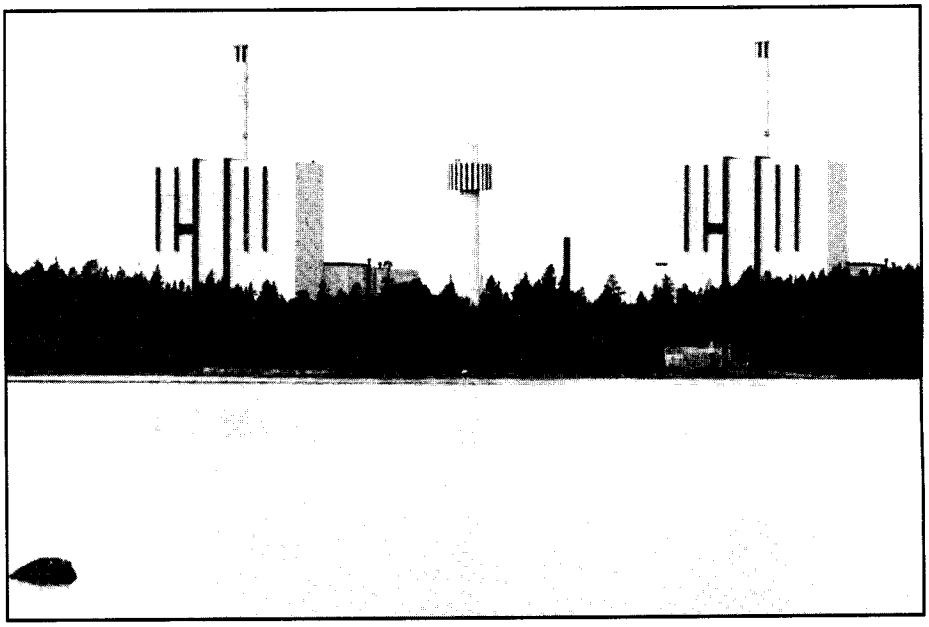
Dagens Nyheter, Stockholm, April 16, 1994.



Better heating

By installing more effective plant for the production and distribution of heat, the Estonian capital of Tallinn could save 30-50 per cent in energy, instead of losing 15-25 per cent as it does today by way of leaks in the pipelines of the present district-heating system. Now however the city has signed a contract with the Finnish Nesté company for modernizing the system and training personnel, all in the course of this year. The municipal heating company expects to recoup its outlay within 3-4 years.

Miljöaktuellt, January 27, 1994.



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NUCLEAR POWER

Hanging in the balance

ALTHOUGH MANY ORDERS for reactors have been cancelled in the last four years, and still more nuclear plants closed down, the total number in operation is still growing. At the end of 1993 there were altogether 419 in operation, as against 416 at the beginning of 1990. Moreover, since the new plants are larger than those that have been decommissioned, the total installed nuclear capacity has risen during this time by 1.7 per cent per annum, from 331 GW_e to 332 GW.

Since cancellations have lately been exceeding new orders by far, there is little likelihood at present of any further increase. After 1990 only twelve new orders have come to the reactor manufacturers. Five of these are from South Korea, two each from China, Russia, and France, and one from Pakistan – the last having had to be placed in China, since Pakistan is in bad books with the rest of the world on account of its nuclear weapon program. On the other hand Combustion Engineering, an American company in the Swedish-Swiss ABB group, is involved in four of the five Korean projects.

In western Europe nuclear power has receded in the United Kingdom, Germany, the Czech Republic, Spain, and Italy – only France having added to capacity. Since 1990 all of Italy's nuclear capacity has been phased out, as it also has in what was East Germany, and there is now one plant less in the former West. Except for France and Sizewell B in England, which is now about completed, all the reactors in western European countries came on stream as long ago as the mid-eighties.

Capacity continues to be expanded on the other hand in eastern Europe and the former USSR – although Russia has only signed for two new re-

Developments since 1990

Bulgaria	2 projects cancelled
China	2 reactors ordered
Czech Republic	2 projects cancelled
France	2 reactors ordered, 4 shut down
Germany (eastern)	5 reactors shut down 6 cancellations
Germany (west)	1 project cancelled
India	4 projects cancelled
Italy	2 reactors shut down 1 projects cancelled
Japan	1 project cancelled
Pakistan	1 reactor ordered
Poland	4 projects cancelled
Russia	3 projects cancelled, 2 orders for new reactors, 7 shut down
South Korea	5 reactors ordered
Spain	1 reactor shut down 1 cancellation
Ukraine	2 reactors shut down
United Kingdom	4 reactors shut down
United States	3 reactors shut down

Cancellation means either construction was stopped or an order cancelled.

actors and cancelled orders for three. There have also been cancellations in Poland (for all four of its new orders), the Czech Republic (2), and Bulgaria (also 2). Seven Russian and one Ukrainian plant have moreover been shut down.

There is the same general situation in the Americas. Canada is building no new plants. Of the few that are being built – two in Brazil and Cuba, and one each in the Argentine, Mexico, and the United States – all are 5-15 years behind schedule. Orders were signed for the Cuban reactors early in the eighties, and for the others still earlier.

It is erroneous to suppose that while things are going badly for nuclear power in the United States, it is all plain sailing in the Far East. Japan has not placed any orders at all since 1990. On the contrary one project, for a boiling-water reactor, has been abandoned.

From the statistics in Nuclear News, from which the information in this article has been drawn, it seems that there are still 87 reactors under construction in various parts of the world. But six in Spain, six in the United States, and one in the Philippines are evidently doomed projects. Figures showing construction progress to date indicate that in fact nothing has happened. So that really only 74 plants are now being built.

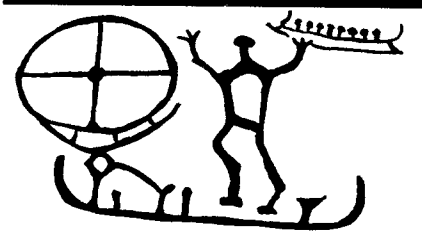
Altogether sixty-six of the existing reactors have been closed down, twenty-eight of them since 1990. Many were small and of an odd type, but in the United States even large water-cooled ones have had to be decommissioned, as being uneconomic.

Because of the generally uneven trend as regards new orders, sure forecasting is impossible. Unless there is a marked change in current plans for the development of nuclear power, its share in worldwide production of electricity will however have diminished by the year 2000, as will the number of plants in operation.

FREDRIK LUNDBERG

Fredrik Lundberg is a freelance writer spcializing on energy and environment.

BRIEFS



Saving the past

They have survived for 3000 years – the rock carvings telling of the lives of Swedish forebears, which now risk being eaten away, in many cases within a lifetime, by acidic fallout. The Board of National Antiquities has therefore announced an international competition, primarily for architects, to devise means of protecting the carvings, with buildings or other structures which will yet allow people to see them.

Further information can be obtained from Riksantikvarieämbetet, Box 5405, S-114 84 Stockholm, Sweden.

First ULEV-cars certified

Chrysler's Dodge Caravan and Plymouth Voyager will be the first cars to be certified in accordance with the requirements for Ultra Low Emission Vehicles set by the California Air Resources Board. The ULEV requirements will come into force in 1997, when 2 per cent of the cars and light-duty trucks sold by the big makers will have to be such as meet them.

The Chrysler minivans, which are driven by natural gas, have V6 engines with an advanced fuel injection system, exhaust sensors, and three-way catalytic converters. In certification tests the emission values came to 0.013 and 0.025 g/km for hydrocarbons and nitrogen oxides respectively – well under the ULEV requirements of 0.025 and 0.12 g/km.

Chrysler's minivans will cost at least $4000 more than corresponding petrol-driven vehicles. The increase is mainly due to the special fuel tanks that are needed for natural gas. No petrol-driven models come up to the ULEV standards.

Ecomonthly, April 1994.

Batteries for hire

Letting car owners hire batteries is what the Renault and Peugeot companies are proposing as way of getting around their high cost. The two French car makers have been carrying out full-scale tests with 50 electric vehicles for several years at La Rochelle on the Atlantic coast, and at the beginning of next year they will start mass production of electric cars – the aim being to turn out 5000 in 1995 and increase output to 50,000 by the end of the century.

Tidningarnas Telegrambyrå, May 3, 1994.

Recent publications

The concept of sustainable transport
By Per Kågeson. Contribution from Transport and Environment (T&E) to the Second Pan-European Transport Conference held in March 1994. The aim of the report is to make a contribution towards an operational definition of "sustainable transport" or "sustainable mobility."

28 pp. Available from T&E, Rue de la Victoire 26, B-1060 Brussels, Belgium.

Critical loads of acidity in the UK (1994)
Summary report of the Critical Loads advisory group, set up by the Department of the Environment. Recounts current knowledge concerning the deposition of pollutants; critical loads of acidity for soils, freshwaters, and buildings; critical levels for vegetation, as well as describing the mapping of critical loads in United Kingdom.

60 pp. Published by Institute of Terrestrial Ecology, Bush Estate, Penicuik, Midlothian, EH26 0QB.

OECD environmental performance reviews: Norway, Portugal, Japan, Iceland
Part of a new OECD Environmental Performance Review Programme, conducting peer reviews of environmental conditions and progress in each member country. Scrutinizes efforts to meet domestic objectives as well as international commitments. The analyses are supported by a broad range of economic and environmental data.

Available from OECD, Rue André Pascal, F-75775 Paris Cedex 16, France.

Consumption versus population – which is the climate bomb? (1993)
By A. Rahman, N. Robins and A. Roncerel (Eds), published by Climate Action Network. An attempt to present the population problem in a way that also takes into account the differences in consumption between rich and poor – something that is often overlooked in the course of debate.

104 pp. Available from Climate Network Europe, 44 rue du Taciturne, B-1040 Brussels, Belgium.

Experimental manipulations of biota and biochemical cycling in ecosystems – approach, methodologies and findings
Ed. by L. Rasmussen, T. Brydges and P. Mathy. Proceedings of a symposium in Denmark in 1992. Several of the manipulations of natural ecosystems indicated in the title associate with the acidification problem.

342 pp. Publication No. EUR 14914 EN of the Commission of European Communities, C.E.C. – DG XII/D-1, 200 Rue de la Loi, B-1049 Brussels, Belgium.

PROGRESS REPORT

The Pan-European Process

AS A MEANS of more effectively monitoring and lobbying the European Environmental Process, a government initiative, environmentalists have set up an NGO Working Group on the Pan-European Environment.

The Pan-European Environmental Process first saw light at a meeting of eastern and western environmental ministers in Dublin in 1990. This meeting, the first after the change in the political scene in eastern Europe, was followed by others in Bergen, Norway, in 1990, in Dobris, Czechoslovakia in 1991, and Lucerne, Switzerland in 1993. The next one is scheduled to take place in Sofia, the Bulgarian capital, in 1995.

The main outcome of the meetings so far has been:

☐ An Environmental Action Programme for Central and Eastern Europe (adopted at Lucerne).

☐ An environmental status report entitled Europe's Environment 1993 (to be published shortly).

☐ A Nature Conservation Strategy for Europe (still under discussion).

☐ An Environmental Programme for Europe (not yet worked out).

Otherwise there have only emerged non-binding declarations, and the Process itself remains low on government priority lists.

Bodies preparing the ground for the ministers' meetings are:

☐ A UN ECE working group of senior government officials which is responsible for the whole Process and the Environmental Programme for Europe.

☐ A task force for the implementation of the Environmental Action Programme for Central and Eastern Europe, to cooperate with a Project Preparation Committee.

☐ A task force on environmental rights and obligations.

☐ The Council of Europe, responsible for the strategy for nature conservation in Europe.

These meetings have been relatively open to participation by non-governmental organizations. Both before and during those at Bergen, Dobris, and Lucerne, environmentalist NGOs were able to get together and decide on attitudes and addresses to the ministers. Only a few of the national groups were in a position however to apply themselves to any extent to the work on the agenda for the Pan-European Process, and only Friends of the Earth and the European Environmental Bureau have been regularly engaged in lobbying. After Lucerne it was felt that the only way to press governments to take the Pan-European Process more seriously, and to influence the environmental agenda for the meetings, was to organize well prepared campaigns.

Consequently on January 24-25, 1994, twenty-three national and international NGOs convened at a seminar in Brussels with these aims:

☐ To broaden the involvement of environmentalist groups in the Pan-European Process.

☐ To assess its political importance.

☐ To decide, well in advance of the Sofia conference, how much time and money the environmentalist organizations should spend in trying to influence it.

☐ To develop an NGO strategy for work in the period preceding the conference, as well as a general agenda for environmentalist work in Europe.

Four topics were singled out for the NGOs to work on prior to the Sofia conference. These were:

Sustainable Europe, including the jobs and environment issues, "green" taxes and the economy, patterns of production and consumption, transportation and energy systems, environmental space for Europe's population, and a change in human values and behaviour.

Environmental Action Programme for Central and Eastern Europe (EAP), with these issues: Evaluation and implementation of the Programme. Implementation of national EAPs. Assessing the involvement of western governments and financial institutions. Monitoring the Project Preparation Committee, and the Task Force for the EAP.

Biodiversity: landscape diversity, tourism, agriculture, and evaluation of the commitments made at the Lucerne conference.

Public Participation: rights of the public for access to information, participation in decision making.

To organize lobbying in advance of the Sofia conference, it was decided to set up an NGO Working Group on the Pan-European Environment and an NGO Steering Committee. The Working Group is divided into four Issue Groups to prepare and carry out the campaigning and lobbying, and to follow the governmental negotiating within the Task Forces. The Borrowed Nature association in Bulgaria has been assigned to act as the NGO Focal Point for NGO work with the process, the spreading of information, and especially for organizing activities in connection with the conference. It will also liaison with the Bulgarian government.

REINHOLD PAPE

Please address inquiries for further information to:

NGO Focal point for the Sofia Conference, Kliment Mindjov, Borrowed Nature, Mladnost 89/11, 1797 Sofia, Bulgaria

Issue-Group "Sustainable Europe", John Hontelez, Friends of the Earth, Min. Elandstraat 27, 6523 CS Nijmegen, The Netherlands

Issue-Group "EAP", Ewout van der Weij, Milieukontakt Oosteuropa, P.O.Box 18185, 1001 ZB Amsterdam, The Netherlands

Issue-Group "Biodiversity", John O'Sullivan, Birdlife International, RSPB, The Lodge, Sandy, England ST19 2DL.

Issue-Group "Public Participation", Raymond van Ermen, European Environmental Bureau, 26, rue de la Victorie, 1060 Brussels, Belgium

PHOTO: © DAN RAPP

POLAND

Debt swapping

SWITZERLAND will be the first country in Europe to allow Poland to set off part of its indebtedness against environmental measures. Under this arrangement Poland is to invest US$150 million, corresponding to 10 per cent of its debt to Switzerland, in environmental projects via a special fund, called the Ecofund.

The Ecofund, which was set up in 1992, spreads money for various projects over four areas: reduction of air pollutants, especially sulphur dioxide; reduction of carbon dioxide emissions; new sewage treatment plants; and preservation of biodiversity, especially in the Biebrza and Bialowieza national parks. Any Ecofund project must be international in scope. So far $20 million has been divided among twenty projects, the money coming mainly from Poland's official debt to the United States.

France is to follow suit by allowing one per cent of Poland's debt, or $40 million, to be invested in Ecofund, and Italy is contemplating a similar move.

Source: **Tomorrow Magazine**, No. 2, Volume IV, April-June 1994.

HEALTH

Allergies and air pollutants

DURING THE LAST FORTY YEARS in the industrialized parts of the world, allergies due to pollen, as well as other kinds, have shown a marked increase. While the time span is altogether too short for a genetic explanation, there is a steadily growing suspicion among scientists that air pollution may be among the causes of allergy in otherwise healthy persons, as well as adding to the suffering of those who already have asthma.

A study recently carried out at the allergy and lung department at Huddinge Hospital, Stockholm, has shown that nitrogen dioxide can intensify the reactions in individuals who are especially sensitive to birch pollen. "Although no definite conclusions can be drawn from a single study," says Dr Gunnar Bylin, department head, "it amounts to this: if you are in an urban area during the pollinating period for birch, and inhale an air pollutant such as nitrogen dioxide, you may experience stronger and lengthier asthmatic reactions than you would in a place with cleaner air. This is something new."

Preliminary results from a similar American study point in the same direction. It shows moreover that nitrogen dioxide in combination with ozone produces a distinct deterioration of the lung function. It seems that exposure to nitrogen dioxide in the morning, for instance during the rush hour, irritates the respiratory organs and starts inflammation. Then later in the day there will be an increase in ozone concentration, since ozone is formed under the influence of sunlight. Ozone has a still stronger effect on the mucous membranes of the respiratory system, and so acts to accelerate the inflammation.

It has been shown in experiments with animals that ozone damages the membrane, causing it to let through substances such as pollen allergens. As yet very little is known however of the effect that all the other air pollutants may have on sensitive individuals.

PER ELVINGSON

Source: **Dagens Nyheter**, April 12, 1994.

Renewables

Eurostat, the EU statistical office, has released its first figures on renewable energy production in the EU. Renewables represented 6.7 per cent of total primary energy or 43.6 million tons of oil equivalent. France is shown as the leader in hydro-electricity, and Denmark in wind power.

T&E Bulletin, No. 26, March 1994.

BRIEFS

End for diesel?

A debate on the toxicity of the exhaust gases from diesel engines has now started in California. The leading scientists studying the issue for the Air Resources Board have said diesel exhaust is about 100 times more potent than benzene and could be the cause of some 800 extra cases of cancer per year in California.

Benzene is already being phased out from petrol and it will be up to the ARB to decide what to do about diesel-exhaust regulation. This is worrying interested parties such as the California Trucking Association, which believes that diesel engines will be ruled out entirely. A proposal for regulation will probably not be presented to the ARB until some time in 1995.

Car Lines, M. P. Walsh, February 1994.

Anyway with less sulphur

Since October 1, 1993, in the USA heavy trucks and buses have been required under the 1990 Clean Air Act to use diesel fuel with no more than 0.05 per cent sulphur. The previous limit was 0.5 per cent. Off-road vehicles, as well as other forms of transport and heating oil, are not covered by the new rule.

Most of the larger refineries are said to have completed the modifications that will be necessary for producing low-sulphur fuel before the deadline. According to the American Petroleum Institute, just under half the diesel fuel produced in the USA at the end of September met the new regulations.

Sulphur, No. 229, November-December 1993.

Cutting emissions

Under a new regulation that will cut releases of volatile organic compounds by an amount equal to removing 38 million cars from the road, chemical plants in the US will have to control their emissions more sharply. The regulation also includes a new feature, called emissions averaging, which will allow a chemicals company to avoid cutting pollution at one location so long as it cuts it more deeply elsewhere.

"We shall save lives, prevent cancer and other serious illnesses, increase crop yields and protect forests and fish," says Carol Browner, head of the Environmental Protection Agency.

In another new rule, the EPA has set limits for emissions of nitrogen oxides from coal-fired power stations. The rule will reduce emissions by 1.8 million tons a year by 2000.

New Scientist, March 12, 1994.

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CITIES

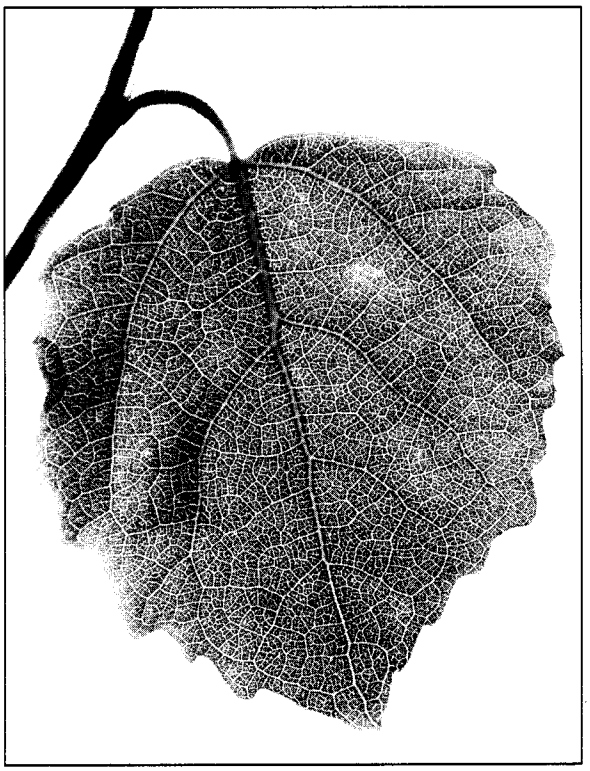
Freiburg shows the way

TWENTY YEARS AGO Freiburg, on the edge of the Black Forest in south-west Germany, was an ordinary city of 200,000 inhabitants and greatly congested traffic. Then a few streets were made car-free. Some of the shop-keepers complained, but most of them found that their trade increased, and soon people wanted to ban cars from still more streets. And so it started. Freiburg has since advanced step by step to becoming a model of environmental development, a city that is attracting study visits from practically all over the world.

German cities enjoy considerable autonomy. Freiburg has been able for instance to use its profits from the sale of energy and water to subsidize public transport by as much as 40 per cent. In 1985 it also allowed the municipal tram and railway company to reduce the price of season tickets by 30 per cent in order to provide an incentive for people to use such transport. A year later 23 per cent of the car users had gone over to travelling publicly and using an "environmental pass," valid for ninety tram, bus, and train lines run by fourteen authorities. There was no loss of revenue.

In 1991 the pass was made applicable for all public transportation companies in the region – which meant for 2,600 kilometres of track – as well as the German federal railway, and more people switched to public transport. Simultaneously with an extension of pedestrianization, 400 kilometres of cycle paths were being laid parallel to 65 per cent of the city's roads. Now 26 per cent of all journeys are made by public transport, and 27 per cent by bicycle. It is hoped, too, that private car travel will fall to 33 per cent.

Stiff parking charges, reduced parking spaces, a 30kph speed limit in the suburbs, and traffic calming on the edge of all residential areas, combined with further investment in the tramway system, have over the past fifteen years cut down car traffic within the city boundaries by almost 20 per cent, as well as reducing accidents by 25 per cent.



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Freiburg has done more than deal with traffic. Time-variable charges have helped reduce electricity consumption, and a new heat-and-power scheme, scheduled for completion in 1996, is expected to reduce emissions of carbon dioxide by 120,000 tons. Freiburg seems well on its way to fulfilling its aim of becoming the most attractive city in Europe. It has in fact become so popular that it is already having to build a suburb for 10,000 people – naturally an environmentally advanced one, too. □

□ On the left is a digest from an article by **John Vidal** in **The Guardian**, March 4, 1994, the opening paragraphs of which appear below.

Take two twinned European cities, Freiburg in Germany and Guildford in Surrey, England, both prosperous regional centres on the edge of fine countryside. Each has a medieval core, an expanding university, a cathedral, theatre, and castle. Heavy industry has hardly touched either city.

Guildford – how to put this kindly – throbs. Its city centre has been brutalized for twenty years by massive developments, and is a chaos of cars, one-way systems, and thunderous traffic. Pedestrians queue for minutes to be given nine seconds to cross the road. There are cyclists in Surrey but they have no human form in Guildford. The only "pedestrianized" street is open to rush-hour traffic. Car culture rules.

Where Guildford hurries and bustles in its chaotic way, Freiburg purrs like a smug BMW. The perfectly preserved medieval city centre is spooky. Where are the cars? One whole square kilometre of the city has been pedestrianized (this will be increased soon) and only orderly trams, bicyclists, and walkers glide over the cobbles. A vast open-air market offers a cornucopia of local produce. It is as packed as Guildford's many supermarkets.

To go from most British cities to Freiburg is to be shocked. You can walk all day around this city and talk and think quietly. You need never see or smell a car, or hear much more than cathedral bells. And Freiburg is twice Guildford's size.

Behind this superficial impression of the two cities lie two approaches to local government. As a local officer in Guildford points out, British cities are legally and financially constrained, confined to a narrow range of tasks allocated them by central government. Guildford cannot run its own buses or its own electricity company. It cannot ban heavy traffic, but it can commission traffic reports.

German cities can raise their own taxes, control their own utility companies, run their own transport networks. Ironically, it was the British occupation authorities after the war who allowed German cities these freedoms. □