NO. 1, APRIL 1997

Acid News

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SHIP'S EMISSIONS

Worth controlling

THERE ARE NOW two more reports showing it to be economically advantageous, and uncomplicated technically, to reduce the emissions of air pollutants from shipping. How the problem can be solved politically is another matter.

Until quite recently it has been given little attention, and there is still no detailed information as to the extent of the emissions. For several sea areas, such as the Mediterranean and the Black Sea, there are not even any responsible estimates. It turned out, too, from a recent study of the northeastern Atlantic, made by Lloyd's Register, that the emissions there were three times bigger than had previously been supposed, and that they were now 1.37 million tons of sulphur dioxide a year and 1.94 million tons of nitrogen oxides (se AN 4/95, p. 5). The former figures, which are still used by the European Monitoring and Evaluation Program in its modelling of acid deposition over Europe, were 0.49 and 0.54 million tons a year.

To the extent that the emissions from land, especially of sulphur dioxide, diminish, the proportion of those from shipping will correspondingly increase, if nothing is done. Calculations made by Det Norske Veritas show an evident risk of shipping becoming the chief contributor to the depositions of sulphur in some areas.

According to several studies, however, measures to control emissions from shipping can be relatively cheap per kilogram of pollutant "saved." The effect of limiting the sulphur content of bunker oil to 1.5 per cent for ships plying in the North Sea and the Baltic has been shown in a report[1] from the International Institute for Applied Systems Analysis (IIASA) which provides the underlying information for the EU Commission in working out a strategy for dealing with acidification within the Union. While the cost for shipping would be 87 million ecus a year, as result of this measure the requirements for emissions from land could be lightened without any scaling down of the desired effect, namely, the 50-per-cent gap closure (see p. 6). Less stringent requirements on land would chop off 1150 million ecus from the sum that would otherwise

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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: Friends of the Earth Sweden, 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 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

It needn't stop there

A RESPONSE to the EU commission's proposal for a strategy on acidification can be expected from the union environment ministers when they meet towards the end of June. The proposal, which was approved by the Commission on March 12, would result in a great improvement in the situation as regards acidification. It would reduce the ecosystem area in the EU countries where acid deposition is exceeding the critical load from the 32.5 million hectares recorded in 1990 to 4.5 million by 2010. See pages 6-7 in this issue.

Remarkable though such a reduction might be, 4.5 million hectares is still a very large area (it would be half as much again as the whole of Belgium). It might moreover include the whole area of those ecosystems that are exceptionally sensitive to depositions of acid – in itself a potent reason for setting the sights higher than envisaged in the commission's proposal. It is explicitly stated in the EU's Fifth Environmental Action Programme that the target for environmental quality is to be a state where critical loads for acidification will not be exceeded anywhere in the union. This target was confirmed, too, in the Council Conclusions on Acidification of December 1995, when the Council invited the Commission to develop a strategy for combating acidification.

But there are also other reasons why the Council of Ministers should call for more far-reaching measures.

More can be achieved than the commission has calculated. In the first draft for a strategy it appeared impossible for the target of the Fifth Environmental Action Programme to be met by 2010. This estimate was based solely however on technical measures. Others, such as more efficient use of energy and fuel switching, had simply not been considered.

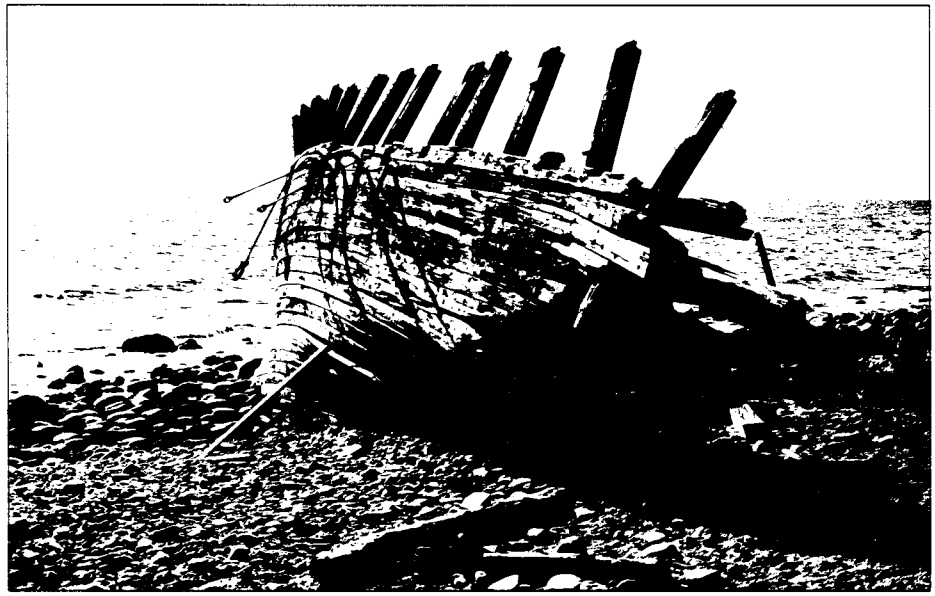
The cost of the reductions has been grossly overestimated. According to the commission's calculations, the emission reductions needed to attain the interim target of a 50-per-cent gap closure by 2010 would cost the EU countries 7 billion ecus a year. But again, only technical measures have been taken into account, because the non-technical options could not be accommodated in the computer model. Clearly however there are many ways of reducing emissions that would cost less than the most expensive technical methods, and many of these less costly measures will in any case be carried out first.

The cost will be greatly affected by the decision to reduce greenhouse gases. In March the Council of Ministers decided that the EU emissions of greenhouse gases, including carbon dioxide, should be reduced by 15 per cent between 1990 and 2010. The cost estimates of the acidification strategy are based however on an energy scenario that supposes a 10-per-cent increase in carbon dioxide during the period. Even a 10-per-cent reduction in CO_2 emissions would result in a considerable reduction of the amount needed to bring about an abatement of the emissions of the acidifying pollutants SO_2 and NO_x – up to 60 per cent in the estimate of the commission's consultant, IIASA.

It would be worthwhile to go further. The ecosystem areas where the critical loads are being exceeded will obviously shrink when the emissions of acidifying pollutants are reduced. But there will also be a great many secondary benefits. It has been shown in an independent study made for the commission that even if only a few of these benefits are counted – the effects on health, structural materials, and agricultural crops – the gain would surpass the cost of the measures for reduction by a wide margin. See AN 5/96, page 5. To these must be added all the other gains, which so far have not been defined in terms of money, such as retained biological diversity, reduced forest damage, and less erosion of cultural objects and buildings.

The aim should therefore be set considerably higher than the 50-per-cent gap closure of the commission's proposal. Taken together with the measures against climate change, much more could be achieved through the acidification strategy for the same cost, or less, as that envisaged for a mere 50-per-cent gap closure.

PER ELVINGSON



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have been needed for attaining that objective.

Reducing the emissions of nitrogen oxides as well as sulphur from shipping in the Baltic, the North Sea, and parts of the Atlantic would, according to IIASA, be a cost-effective way of reaching a 50-per-cent gap closure. Measures applied to shipping would provide the same environmental gain as any on land, but at a lower cost. The total cost of the 50-per-cent gap closure would be 25 per cent less if controls were also imposed on shipping, compared to that in a scenario where only land-based sources were controlled.

As has just been brought out in a report[2] from T&E, the European Federation for Transport and Environment, greatly reducing the emissions of acidifying pollutants from ships would not present any technical problems. Sulphur would be simplest to deal with, only requiring a switch to the low-sulphur oil which is already available on the market. Engines would only have to be rebuilt if oils with a very low sulphur content, down to 0.1 per cent, had to be used.

There are a number of technical solutions, of varying cost and efficiency, for controlling nitrogen oxides. Here it is a matter on the one hand of engine adjustment, to avoid the high temperatures at which a great deal of NO_x is formed, and on the other of after-treatment of the exhaust gases. The most effective of the latter methods is selective catalytic reduction (SCR), with which the

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For environmental effect

SWEDEN intends to lower shipping dues for ships running on low-sulphur fuels which are also equipped for advanced control of nitrogen-oxide emissions. Harbour dues will also be lower than for other vessels. The National Maritime Administration had been ordered by the government to work out a detailed proposal for presentation on April.

The move came as a result of an agreement to reduce the emissions of sulphur and nitrogen oxides from shipping by 75 per cent soon after 2000. This was an agreement made last year between the administration, the Swedish Shipowners' Association and the port authorities.

The idea is of course to make it profitable to be environmentally clean. The income of the shipping and harbour administrations will hardly be affected, since the polluting vessels will be paying more and thus make up for the loss of income from the clean kind. All ships entering Swedish ports or passing through the Swedish economic zone (extending 200 nautical miles out from land) will be affected by the scheme.

The size of the dues, discounts, etc. is now a matter of negotiation between the parties. The intention is to have the system in operation by January 1, 1998. □

ON THE FOLLOWING PAGES

TWO PROTOCOLS

Held up for lack of ratifications

ALMOST THREE YEARS after signing, the sulphur protocol adopted under the Convention on Long Range Transboundary Air Pollution has still not been ratified by a sufficient number of countries. Nor has that on volatile organic compounds, which was signed as far back as 1991. So neither has been able to take effect.

Ratifying an international agreement means that the text of the agreement has received the assent of the legislatures in the signatory countries. In both of the above cases the protocol will come into force only after ratification by sixteen of the contracting parties.

So far the VOC protocol has been ratified by fourteen countries. Among the signatories that have not done so are Belgium, Bulgaria, Canada, France, Greece, Portugal, Ukraine, the United States and the European Union.

As regards the sulphur protocol the situation is as follows:

HAVE RATIFIED: Norway, Sweden, the Netherlands, Luxembourg, United Kingdom.

ANNOUNCING THAT THEY HAD OR WERE ABOUT TO RATIFY*: Czech Republic, Austria, Belgium, Canada, Denmark, Greece, Slovenia, Switzerland.

NOT ANNOUNCING THAT THEY ARE ON THE WAY TO RATIFYING: Bulgaria, Croatia, Finland, France, Germany, Hungary, Ireland, Italy, Liechtenstein, Poland, Russian Federation, Slovakia, Spain, Ukraine, and the European Union.

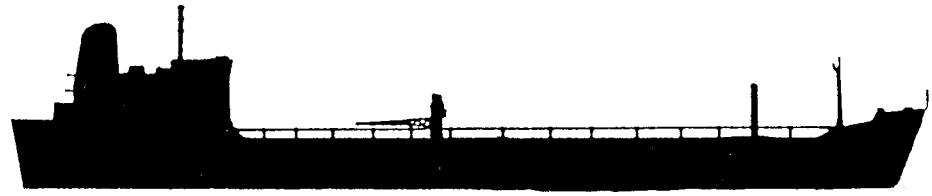
There are a number of countries that have not yet signed the sulphur protocol, among them being Belarus, Latvia, Lithuania, Romania, Portugal, and Turkey.

Estonia is not even a member of the Convention.

MIKAEL JOHANNESSON

* Announcements made at a meeting with the Executive Body of the Convention last November.

More information can be had on the internet site www.unicc.org/unece/env/conv/conv_h.htm. See also Recent Publications on page 13 of this issue.



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emissions can be reduced by something like 95 per cent. Ammonia or urea is sprayed into the gases before they pass a catalytic converter, where the nitrogen oxides are reduced to nitrogen gas, leaving water as a by-product.

Because shipping is largely an international business, a logical step is to try and bring about global agreements to limit the emissions from it. The body dealing with the matter is the International Maritime Organization (IMO), a UN organ. It was agreed within the IMO in 1991 that the targets for reductions of sulphur dioxide and nitrogen oxides should be 50 and 30 per cent by 2000. A start had also been made the year before on an air-pollution annex to the MARPOL 73/78 Convention.

The procedure has however been long drawn out, and it is widely feared that the annex, which probably will be adopted next September, will be a greatly watered-down document. The draft only contains weak requirements for NO_x emissions from new vessels – and none for existing ones – and sets the maximum sulphur content for bunker oil at a level far above the present world average (proposing 4.5-5 per cent, as against 2.8-3.0 per cent).

One possibility would be to have the Baltic and the North Sea defined in the annex as special areas with their own requirements for the sulphur content of bunker oils. The level at present considered is 1.5 per cent. There is already a draft for the Baltic, and several North Sea countries, led by Norway, are pressing for the inclusion of that sea too.

It is still uncertain however what will come out of the negotiations within the IMO. It will in any case take time before an annex can take effect. Better results could probably be obtained, and more quickly, if several countries were to follow Sweden's lead by imposing harbour and shipping dues that are differentiated according to environmental effect (see previous page).

A strong incitement to action may also come from public opinion. Last year the giant forest-products company, AssiDomän, started using bunker oils with a maximum sulphur content of 1 per cent for its seaborne transports – as a means of furthering its environmental image. Another company, Stora, requires ships carrying its products between the Swedish port of loading in Karlstad and Spain/Portugal to use fuel with a sulphur content of no more than 0.2 per cent.

Since regard for the environment has become a competitive argument for ferry companies, too, operating in inter-Scandinavian trade, they have now been using oil with a sulphur content of less than 0.5 per cent for several years on many of their ships. This was also the reason given by the managing director of the Stena Line for fitting its new ferry *Stena Jutlandica* for selective catalytic reduction.

PER ELVINGSON

[1] **Cost-effective Control of Acidification and Ground-Level Ozone**. Second Interim Report. Amann et al. IIASA, December 1996.

[2] **Air Pollution from Sea Vessels. The need and potential for reductions**. Oftedal et al. 1996. T&E Report 96/9. Available from T&E, Rue de la Victoire 26, 1060 Brussels, Belgium. Fax. +32-2-537 7394.

With wind in its sails

Equipping a freighter with 10,000 sq metres of sail on six masts will cut its fuel consumption by two-thirds, according to a Danish project named Modern Windship that is being sponsored jointly by government and shipping interests. The model is a mixed-cargo vessel that will be able to negotiate both the Panama and Suez canals. The combination of sail and diesel-electric engines is calculated to give an average speed of 11 knots, as against 13-14 knots for a conventional vessel of the same size. With present oil prices, freight charges will be ten per cent higher than those for a purely diesel-driven vessel.

Ny Teknik No. 49, 1996.

Going still further

THE SECTOR where Sweden's emissions of sulphur could be most reduced and at the lowest cost is, according to the country's Environmental Protection Agency, shipping.

Since 1980, Sweden has reduced its emissions of sulphur by 81 per cent. This development is well in line with the country's commitment through the second sulphur protocol under the Convention on Long Range Transboundary Air Pollution and also with its national aims – in both cases calling for a reduction of 80 per cent in the interval between 1980 and the year 2000.

Nevertheless acidification is still going on – largely because of the imports of air pollutants from other countries. About 90 per cent of the sulphur falling on Sweden comes in from outside, and the proportion of oxidized nitrogen is about the same. Sweden must therefore set its hope on more stringent international requirements – such as can in fact be expected as a result of the EU strategy for dealing with acidification that is now in course of being thrashed out (see pp. 6-7). This will however bring pressure on Sweden to reduce emissions still further, and so the EPA has been instructed to see how it can be done.

Swedish emissions now split as follows: transportation 25 per cent, the burning of oil, coal, and other solid fuels 36 per cent, industrial processes 39 per cent. Since 1980 there have been big reductions in all sectors, due mainly to a switch from oil to other kinds of fuel (and nuclear power), improved efficiency in the use of energy, more stringent requirements for emissions and structural changes in industry, harder restrictions on the sulphur content of oils, and a tax on emissions of sulphur.

None of these measures have however applied to shipping, which at present accounts for 22 per cent of Sweden's emissions. But of the reductions now proposed by the EPA, amounting altogether to 25,000 tons of sulphur dioxide a year, 15,000 tons would come from shipping – and it is estimated that such a reduction could be achieved if all vessels were to use oil with a maximum sulphur content of 0.5 per cent. The cost is put at 11 kronor for every kilogram of sulphur that would not be emitted. The economic (dis)incentives would be differentiated lighthouse and harbour dues (see p. 3).

Among the other proposals that the EPA is making is a lowering of the sulphur content of gas oil from the present 0.1 to 0.05 per cent. That would cut down the emissions of sulphur dioxide by 2000 tons a year, at a maximum cost of 50 kronor per kilogram of sulphur so eliminated. Extending the tax on sulphur to oils with an 0.05 content is suggested as a financial incentive (at present there is no tax on oils with a sulphur content of less than 0.1 per cent). It is further suggested that the tax should be indexed, since it has remained at the same nominal level – 30 kronor per kilogram of sulphur emitted – as it had when it was introduced in 1991. In today's money it would be about 35 kronor.

Measures already voted within industry will, according to EPA estimates, have cut emissions of sulphur dioxide by 9000 tons per annum by the year 2000. Further measures proposed by the agency would increase that figure by 5000 tons.

An uncertainty after 2000 will be the effects on the energy system of phasing out nuclear power. It is estimated however that this will not bring about an increase of more than 5000 tons of sulphur dioxide a year. The consequence would be that Sweden's total emissions would still have dropped by around 25,000 tons sometime between 2005 and 2010 – a reduction of 86 per cent since 1980.

It emerges from the environment agency's research that it would be possible to reduce the emissions still more, but at a greatly increased cost. Also pointed out in the report, however, is the fact that measures to reduce emissions of carbon dioxide would automatically bring down those of sulphur as well – at little or no cost.

PER ELVINGSON

Reduktion av svavelutsläppen efter år 2000. Report 4645. In Swedish only. Available from the Swedish EPA, 106 48 Stockholm, Sweden.

BRIEFS

More power to windpower

Windpower is now the world's most rapidly expanding source of energy. The capacity of all the 25,000 wind turbines in operation in 1995 amounted to 4900 megawatt – representing an increase of 1200 MW in a single year. Since 1990 global windpower capacity has been increasing at a rate of 20 per cent a year, whereas nuclear and coal power have hardly increased at all.

In 1992 the total installed windpower capacity in Europe was only 860 MW. By the end of 1995 it was 2500 MW – a threefold increase in three years. Germany now heads the trend, with Denmark second. The United Kingdom, which is thought to have the greatest potential, is planning to install hundreds of megawatts of windpower. Even in France, with the most strongly entrenched nuclear industry, schemes are afoot for something between 250 and 400 MW in the course of the next decade.

The general trend is now towards ever larger turbines, improvements in technology, and lower production costs.

Ny Teknik No. 42, 1996.

Now in jeopardy

Norwegian emissions of volatile organic compounds have been found to be 24 per cent greater than previously assumed. It is mainly the evaporation during transfer of crude oil to tankers that has been underestimated. This may hinder the fulfillment of the country's undertaking, by signing the protocol under the Convention on Long Range Transboundary Air Pollution, to reduce its emissions by 30 per cent between 1988 and 1999. So far they have increased by 35 per cent instead of the calculated 13 per cent.

Natur&Miljö Bulletin No. 2, 1997.

The cost of convenience

The electronics in a luxury car consume almost as much fuel as the engine in a small car, or 3-4 litres per 100 kilometres in urban driving. Every added kilowatt increases fuel consumption by 1.7 litres per 100 kilometres. But there is no indication of this in the manufacturers' figures for fuel consumption; for a fuel-efficient car the divergence may be considerable. The German carmakers who, headed by Volkswagen, are now planning a three-litre vehicle for sale at the end of the century, have recently joined forces for development of a more efficient electric system for cars, for instance through raising the voltage.

Ny Teknik. December 19, 1996.

Advancing plans for a strategy

THE LAST ISSUE of Acid News contained a report on the work that was going on within the European Union to develop a strategy for dealing with acidification. The proposal for a strategy document that was put forward in October has since been further revised, and after adoption by the commission on March 12 presented in the form of a Communication to the Council and Parliament. The commission has also accepted its own environment directorate's proposal for a directive to limit the sulphur content of fuel oil, and one that the EU should ratify the 1994 sulphur protocol.

The commission has followed the environment directorate's line in recommending a 50-per-cent gap closure as an interim target for the new strategy. This means that the ecosystem area where the critical load for acid deposition was being exceeded within each 150x150-kilometre grid cell in 1990 should be *at least* 50 per cent less in 2010. For the European Union as a whole the result would be that the ecosystem area where the critical limit is being exceeded would be reduced from 32.5 to 4.5 million hectares.

The following are the measures proposed for attainment of the the interim target:

☐ National emission ceilings should be set (see table).

☐ Specific measures set forth in various EU directives should be adopted (see below).

☐ All member countries should ratify the second sulphur protocol under the Convention on Long Range Transboundary Air Pollution, thus enabling it to take effect. See page 4.

☐ Both the EU and individual member countries should strive to persuade countries outside the union to take further steps, within the Convention or otherwise, to reduce emissions of acidifying substances.

☐ The member countries should actively push for reduced emissions of sulphur from shipping (see again below).

As can be seen from the table, for some countries no measures will be required beyond those already adopted or planned in accordance with the reference scenario (REF). In general, all ceiling figures should be regarded as approximate. As a result of work just started on a strategy for ozone, adjustments will probably have to be made in the NO_x figures in order to arrive at a cost-effective way of attaining the aims both of the acidification and ozone strategies. This in turn will call for adjustments of the ceilings for sulphur dioxide and ammonia. The final draft of a directive on emissions ceilings can be expected early next year.

The Commission is recommending a 50-per-cent gap closure

A revision of the directive on large combustion plants (88/609/EEC) should be ready this autumn. According to the proposed acidification strategy, the revised directive should include national ceilings for emissions from existing as well as new LCPs, based on the country-by-country reductions needed for attainment of a 50-per-cent gap closure.

In March the commission decided, as a part of the strategy, to propose adoption of a directive concerning the sulphur content of certain liquid fuels. According to a draft for this, there would be a general limit of 1 per cent for sulphur in heavy fuel oils, taking effect in 2000. But in areas where there are no local problems of air pollution, and local sources do not contribute significantly to transboundary effects, member states could obtain a derogation allowing them to use heavy fuel oils with a maximum sulphur content of 2.5 per cent. Exemption from the 1-per-cent limit would be granted to combustion plants fulfilling certain requirements in regard to emissions. The limit proposed for sulphur in gas oil would be 0.2 per cent, as in the existing directive 93/12/EEC.

The new fuel-oil directive would be based on the article 130S of the EU treaty, instead of 100A, which was the legal basis for the directive 93/12/EEC. It would allow member countries so wishing to lower the sulphur limit still further, and those already having stricter requirements to retain them. As regards bunker fuels and emissions of sulphur from shipping, it is proposed that the member countries should, "in the context of the revised MARPOL Convention,"

Provisonal national emission ceilings proposed for 2010, to attain the interim target of a 50-per-cent gap closure (GAP), compared with emissions in 1990 and those projected for 2010 under the reference scenario (REF).

	Sulphur dioxide			Nitrogen oxides			Ammonia		
Country	1990	REF	GAP	1990	REF	GAP	1990	REF	GAP
Austria	90	57	57	222	116	116	91	95	93
Belgium	317	215	52	352	196	129	95	106	74
Denmark	180	71	31	269	119	88	140	103	82
Finland	260	116	116	300	163	163	41	30	30
France	1298	691	235	1585	895	766	700	669	630
Germany	5331	740	414	3071	1279	1079	759	539	318
Greece	510	361	361	306	282	282	78	76	76
Ireland	178	155	41	115	73	42	126	126	126
Italy	1678	847	204	2047	1165	1160	416	391	305
Luxembourg	14	4	4	23	10	10	7	6	6
Netherlands	205	56	38	575	140	139	236	82	81
Portugal	283	194	194	215	206	206	93	84	84
Spain	2266	1035	617	1178	851	826	353	373	373
Sweden	136	97	66	411	207	207	61	53	49
United Kingdom	3752	980	279	2702	1244	753	320	270	224
EU total	16498	5619	2709	13371	6926	5966	3516	3003	2551

Although distinct improvements in the environment can be expected as a result of the new strategy, by 2010 there will still be 4.5 million hectares where sensitive ecosystems will be getting greater depositions of acid than they can tolerate in the long run.

try to get the Baltic Sea and/or all parts of the North Sea and the English Channel designated as SO_x-sensitive zones. The idea is that it should only be permissible to use bunker fuels with a maximum sulphur content of 1.5 per cent in those areas.

No proposals have yet been put forward for ammonia.

The annual cost for a 50-per-cent gap closure, over and above that for the reference scenario, is put at 7 billion ecus. This estimate assumes however that only technical methods will be used to bring down emissions, that the energy use within the EU will increase by 20 per cent between 1990 and 2010, and that the emissions of carbon dioxide will increase by 10 per cent during the same period.

Prior to its previous meeting on January 16, the commission had ordered a study of an alternative "low CO_2 scenario" to see the effect of simultaneously reducing the emissions of carbon dioxide within the EU by 10 per cent. Assuming an increased efficiency in the use of energy, curbing of the expected demand for energy, and increased use of energy from renewable sources, this scenario would lead to smaller emissions of acidifying substances, which in turn would result in the costs of the measures required for attaining a 50-per-cent gap closure being lowered by about 60 per cent – from 7 to 2.9 billion ecus per annum.

This lower figure does not however include costs of bringing about the above-mentioned changes in the energy system. But other studies have revealed great possibilities for reducing the costs if other than technical measures are also applied. In its report to the commission, IIASA had stated that "earlier analysis has demonstrated that non-technical measures, modifications of the energy system (e.g. fuel substitution, energy conservation, etc.) and changes in the economic structures can reduce emission control costs substantially, in certain cases by more than 50 per cent."

The strategy proposal also includes estimates of how a 50-per-cent gap closure would affect concentrations of ground-level ozone. From preliminary analyses it appears there would be marked improvements in those areas where the formation of ozone is limited by the availability of nitrogen oxides – as is the case in most EU countries. But in some parts of northwestern Europe, where volatile organic compounds are the limiting factor for ozone forming, it is not likely that there would be any improvement, but rather some slight worsening of the situation.

MIKAEL JOHANNESSON

The intention is that the council of ministers will be deciding on the commission's proposals at its meeting late in June.

OZONE

Strategy started for this too

PARALLEL to its strategy for handling acidification, the EU Commission's environment directorate of has now started work on another to combat the high concentrations of ground-level ozone that plague the EU countries every summer. Knowledge of the harmful effects of ozone on health has expanded of late, adding to the pressure on politicians to do something about this problem too.

Since ground-level ozone is formed from nitrogen oxides and volatile organic compounds, the ozone strategy will concentrate on measures aimed at cutting back the emissions of these two pollutants. There will thus be some overlapping with the strategy on acidification, which also deals with nitrogen oxides, as well as with a number of EU directives that are now being considered or revised, such as those on motor-vehicle standards, fuel quality, emissions from large combustion plants, and evaporation from solvents used in industry.

It appears from the modelling that has so far been done that very heavy reductions will be required both of NOx and VOCs – more than 75 per cent in each case – if ozone concentrations are to be brought down to levels that will be acceptable from the point of view of human health and not cause damage to vegetation. What the interim and/or final aim for the strategy will be has yet to be determined.

The development of an EU strategy for ozone will be coordinated with the work on ozone within the framework directive for air quality (see AN 5/96, p.9), and the commission is to have a proposal ready for presentation to the Council of Ministers early in 1998.

The problem of ground-level ozone is not only being attacked at EU level, but also within the Convention on Long Range Transboundary Air Pollution – where ozone figures prominently in a new "super-NOx protocol" that is now in course of development. This new protocol will embrace emissions of nitrogen oxides, volatile organic compounds, and ammonia. It should be ready for signing in 1998. □

BRIEFS

Moving forward

The EU Commission's proposal for new standards for cars and fuels – the auto-oil package – which were presented last summer (see AN 4/96) comprised two stages: the first with specific requirements for the year 2000 and the other adumbrating those for 2005.

Although Auto-oil I is still under discussion, work on II has already started, this time on a wider base, with seven working groups considering not only technical requirements but also non-technical measures such as economic instruments and other means of influencing traffic flows – all with the aim of improving air quality. Whereas the work on Auto-Oil I was conducted behind closed doors, in a collaboration between the Commission and the industries, this time both the member countries and environmentalist NGOs will have full access as observers and the possibility of representation in the working groups.

Dragging its feet

The EU Commission is threatening legal action against Belgium for failing to implement a directive for reduction of the sulphur content of fuels. The directive (93/12/EEC), aiming to improve air quality by reducing sulphur in fuels used in cars, aircraft, and ships, should have been incorporated in Belgian law by October 1994. If Belgium does not respond to the Commission's second request for action, it will be taken before the European Court of Justice.

T&E **Bulletin** No. 55. February 1997.

Scope for green taxes

The EU Commission has published a set of guidelines to help the member states impose "green taxes" without breaking the laws for the internal market. The environment commissioner Ritt Bjerregaard said that, far from constituting a straitjacket, the guidelines show there is considerable scope for member states to increase their use of green taxes.

T&E **Bulletin** No. 55. February 1997.

Airlines' fuel

During its six months of EU Council of Ministers' Presidency, the Netherlands is hoping for a review of the tax relief airlines enjoy for fuel. The Dutch, feeling the concession is incompatible with the environmental harm from air traffic, have instructed the Commission to consider, as a matter of urgency, the possibility of taxing services within the union and even all flights to and from the EU.

Europe Environment. February 11, 1997.

SOLVENTS

Directive proposed

LAST NOVEMBER, after five years of consultation with the member countries and the affected industries, the EU commission issued a proposal for a directive* for curbing the emissions of volatile organic compounds due to the use of solvents in industry.

It estimated that some 400,000 businesses in twenty different trades would be affected by such a directive. Their use of solvents is responsible, according to the commission, for about half of the industrial emissions of VOCs in the union. It is hoped that when the directive is fully applied in 2007, the emissions from these sources will have been reduced by two-thirds from their 1990 levels. By weight, that would amount to a cut from 2.2 million tons per year to 0.7 million.

The directive is regarded by the commission as important for lessening the formation of ground-level ozone, of which VOCs are one of the precursors. It is of course also aimed at reducing people's exposure to the noxious effects of solvents.

The commission's proposal does allow for some freedom for member states and/or the users of solvents. Any country could, instead of imposing general requirements for the use of solvents, set up a national plan allowing reduction trade-offs between different sectors, depending on the national situation.

Of the 4 billion ecus per year that the directive is thought to cost business firms, a relatively large part, 700 million ecus each, will fall on the surface-cleaning and car-coating sectors. It is estimated that the cost per ton of emission that is prevented will be 2000 ecus, as against 3000 ecus per ton for emissions of ozone precursors under the auto-oil program.

* COM(96)538 Proposal for a Council directive on the limitation of the emissions of organic compounds due to the use of organic solvents in certain processes and industrial installations.

RENEWABLES

A strategy for their greater use

THE EUROPEAN COMMISSION has outlined an EU strategy for renewable energy that seeks to double the contribution of that form to energy consumption to almost 12 per cent by 2010. A plan of action is expected later this year as a result of a green paper that was presented last November.

The energy commissioner, Christos Papoutsis, said the 12-per-cent target was realistic "given political will." If attained, it will mean a reduction of carbon-dioxide emissions by 400 million tons a year. A majority of the European energy ministers approved the proposal at its first reading in December. But Britain – which draws just 0.6 per cent of its energy needs from renewables – argued it was too ambitious, while France and Germany spoke out against expecting each country to reach the goal individually. Finland was the only country that wanted a bigger increase.

In its green paper the commission says the union should make renewables more cost-competitive by ensuring that the external costs of other forms of energy are factored into their prices. The member countries using proportionately the greatest amount of renewables are Austria and Sweden (both 24 per cent), Finland (19) and Portugal (17.5 per cent).

Source: **Europe Environment** No. 489. December 3, 1996.

* COM(96)576. Energy for the Future: Renewable Sources of Energy. Green Paper for a Community Strategy.

Correction

There were two errors in the statistics on page 15 of AN 5/96. In Table 2 the figure for the contribution from indeterminate sources (IND) to depositions over Germany should be 540 (not 5540) and in Table 3 the Polish contribution to depositions over Sweden 54 (not 554).

AIR QUALITY

Revised guidelines from health organization

THE World Health Organization will soon be issuing revised air-quality guidelines for Europe. Outstanding changes from the old version will be a halving of the figure for short-term exposure to nitrogen dioxide and the omission of a guide value for particulate matter. The list includes some thirty pollutants.

The organization's guidelines for air-quality for Europe were first published in 1987, with the aim of providing "a basis for protecting public health from adverse effects of environmental pollutants and eliminating or minimizing exposure to those pollutants that are known or likely to be hazardous to human health or well-being."

The figures that the WHO will now be presenting, which in some cases represent a sharpening compared with the old, reflect the greater knowledge of the noxious effects of air pollutants that has been acquired in recent years. There are however studies that suggest a further tightening would be in order, for instance for ozone. A couple of years ago the British government's Expert Panel on Air Quality Standards proposed 100 $\mu g/m^3$ as the maximum eight-hour average value for exposure to this pollutant (the WHO figure is 120 $\mu g/m^3$), and last year the Swedish Institute for Environmental Medicine wanted to make it still lower: 80 $\mu g/m^3$ as the maximum one-hour exposure.

The fact that WHO will no longer be giving a guide value for particulates does not mean it considers them unharmful, but rather that it sees no way of defining a harmless level. There is much to suggest from the intensive research that is going on that is the number of particles that is dangerous, rather than their chemical composition and total weight. For the time being, the WHO is giving information as to the dose-effect connection, leaving it to decision-makers to choose those effects they deem acceptable.

Although they are not legally binding, the WHO guidelines are nevertheless of great practical importance. This last revision has been made in close cooperation with the EU commission's environment directorate, and the new guidelines have been an important starting point for the commission's own revision of the EU limit values for nitrogen oxides, sulphur dioxide, and lead.

The commission's proposals for new limit values for these three pollutants, as well as particulates, were to have been presented around year-end 1996/97, but are now awaited for the summer. There appears every likelihood of their approximating the WHO values, which would mean a distinct tightening up on several counts.

PER ELVINGSON

Note. The full report on the revisions will be available later in the summer. For imformation, please contact: WHO, European Centre for Environment and Health, P.O. Box 10, NL-3730 AA De Bilt, Netherlands.

WHO's revised air quality guidelines for Europe, 1996. Unless otherwise stated, refer to effects on health.

	Guideline ($\mu g/m^3$)	Averaging time
Nitrogen dioxide	200	1 hour
	40	annual
	30	annual[1]
Sulphur dioxide	500	10 minutes
	125	24 hours
	50	annual
	10-30	annual[1]
Particulate matter	*effect/response*	
Ozone[2]	120	8 hour

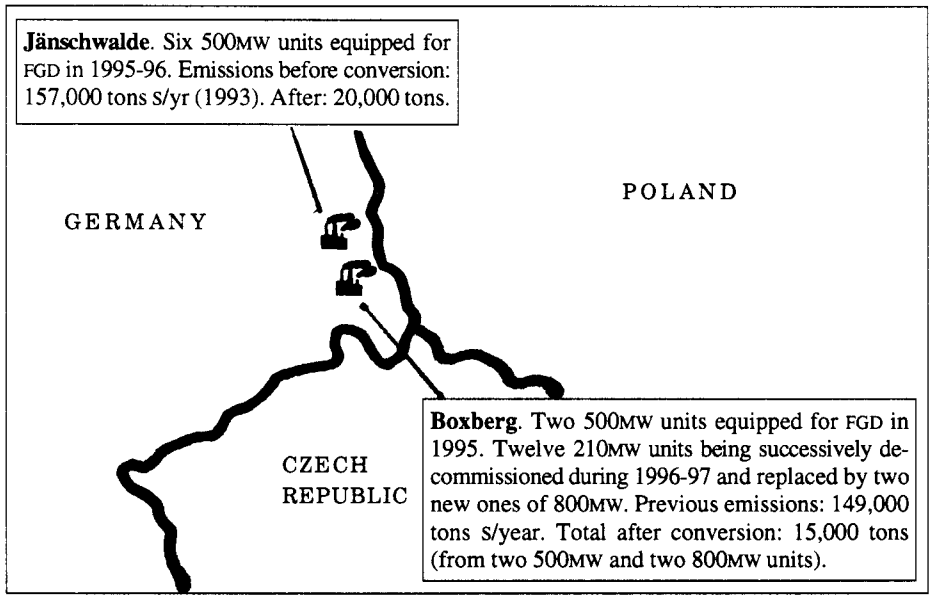
[1] For effects on vegetation (critical levels) as determined in the work under the Convention on Long Range Transboundary Air Pollution.

[2] Critical levels have also been formulated for the effects of ozone on vegetation, but have been expressed differently. See Acid News 4/96, p.10.

Alarm in Norway

Airborne particles are the cause of 400 cases a year of lung disease among the 450,000 inhabitants of Oslo, the Norwegian capital, according to the calculations of the Statistisk Sentralbyrå. Ninety of those already ill die earlier than they would otherwise. Short absenteeism causes a loss of altogether 330 working years besides generally reduced productivity. Particles in the air are responsible for 5000 24-hour lying-in cases at the hospitals, and almost half of them are thought to be due to acute exposure of these pollutants.

Natur&Miljö Bulletin No. 20, 1996.



GERMAN EAST

Startling reduction of emissions

AT THE TIME of German reunification in 1990 there was a sharp contrast, in environmental respects as well as others, between the eastern and western parts of the country. The East German emissions of sulphur in particular were enormous. They were in fact probably the highest in the world, per capita. This was largely due to the large-scale burning of lignite.

As from July 1, 1990, however, the West German environmental laws began to be applied in the East. Plants deemed to have only a limited remaining lifespan were allowed to continue as they were until 1999, while the rest had to meet western requirements at the latest by June 30, 1996. In December 1990 the whole of the coal-fired power sector in eastern Germany was brought under a single company, the newly started Vereinigte Energiewerke AG, VEAG.

The plants burning lignite, with a total capacity in 1990 of 12,750 megawatt (MW), were in a bad state generally. The only means employed for cleaning the flue gases were electrostatic precipitators, and even they were badly maintained and basically inefficient. It was decided that the worst plants should be successively closed down, and by June 1996 some 5500MW had been decommissioned, to be followed by at least 3000MW by 1999. But eight 500MW units were to be modernized: six at Jänschwalde and two at Boxberg.

All eight of these 500MW units have been equipped for FGD, flue-gas desulphurization. While the actual processes differ slightly, in every case the flue gases are sprayed with a limestone-water suspension, which captures 95 per cent of the sulphur dioxide. A good-quality gypsum is obtained as a byproduct.

The emissions of nitrogen oxides were lowered by making various modifications in the combustion process. This has enabled them to be reduced by about 60 per cent at a relatively low cost.

The upgrading was finished by June 1996. Although desulphurization is said to lower the plants efficiency somewhat, renovations and modifications in other respects have resulted in a net increase in efficiency of 10 per cent, from 32 to more than 35 per cent. The cost, in terms of energy output, has amounted to 1.6 pfennig per kilowatt-hour, as against an estimated 2.2 pfennigs before the change.

To compensate for the loss of output from the plants that have been closed down or are about to be closed, VEAG is planning to build six new 800MW units using lignite. Most of the power produced in eastern Germany will then continue to come from plants fired with lignite, since there are a political will for going on using this domestic energy resource.

PER ELVINGSON

Source: *Primary and secondary measures to reduce emissions from existing VEAG lignite-fired power plants.* By M. Recker and M. Kehr. Document presented at the 6th ECE Seminar on Control Technology for Emissions from Stationary Plants. Budapest, October 14-17, 1996.

Comment. In the Secretariat's survey revealing the 100 worst emitters of sulphur in Europe at the beginning of the nineties (APC series No. 3), Jänschwalde and Boxberg came eighth and ninth on the list. The amount by which their emissions were subsequently reduced (altogether 269,000 tons of sulphur a year) is more than five times that of all Sweden's present emissions.

Carburettor out

A petrol engine with direct injection developed by Mitsubishi uses 35 per cent less fuel than an ordinary one. The fuel is injected under high pressure directly into the cylinder, as in a diesel engine. This method, together with a specially shaped cylinder, makes it possible to use a very lean fuel mixture, with consequent low fuel consumption. At the same time the combustion temperature can be kept low, which restricts the formation of nitrogen oxides. Mitsubishi claims that in combination with a new catalyzer the emissions of NOx can be reduced by a good 95 per cent. As a result of efficient combustion, the emissions of volatile organic compounds will also be low.

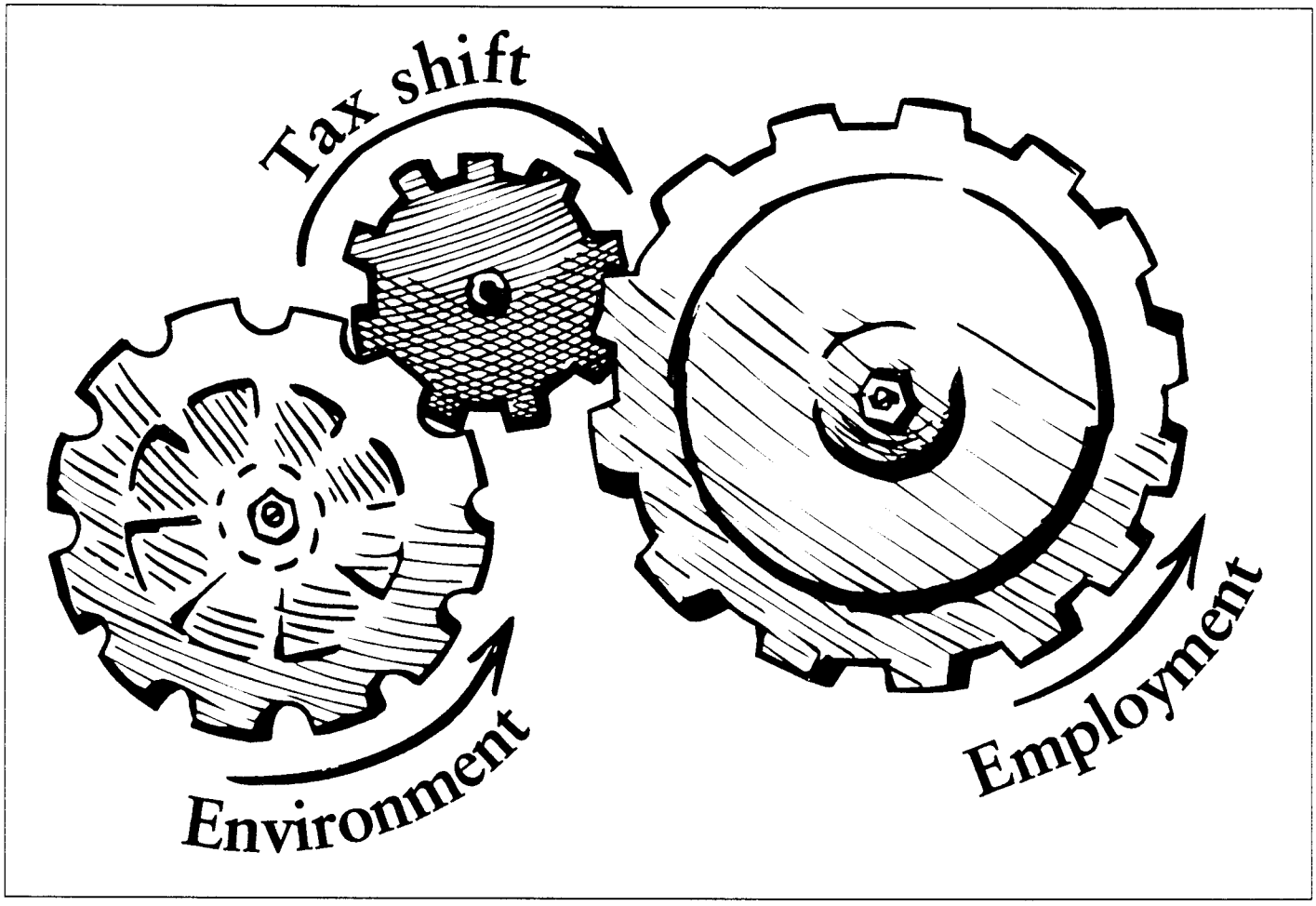
Direct injection has hitherto only been used for diesel engines – at a cost of relatively high emissions of nitrogen oxides. A modern diesel normally emits three times the amount of NOx as an equivalent petrol engine. Vehicles with the new GDI engines, which have been onsale in Japan for the last six months, will be available in Europe this coming autumn. Mitsubishi plans eventually to use no other type.

Source: **Trafik&Miljö** No 3-4/96.

One company to stop using orimulsion

Firing with orimulsion – "the world's dirtiest fuel," see AN 5/95 – is to cease at one place in Britain. The PowerGen electricity generator has announced its intention of closing down the only plant in the country now licensed to burn this bitumen-water emulsion with exceedingly high contents of sulphur and heavy metals. Denying any environmentalist influence, the company maintains that it is acting purely from economic reasons. But at the same time its rival, National Power, is seeking permission to use orimulsion at a plant in Milford Haven, West Wales, that is now oil-fired.

Environment Watch: Western Europe. November 15, 1996.



TAX SHIFT

Two birds with one stone

Present economic policies are, in the view of environmentalists as well as many economists, wrong on two counts. High taxes on labour suggest that it is in short supply, and practically none on the environment that we have endless resources to draw upon – whereas in fact the opposite is the case. Labour is overplentiful, with consequent unemployment, while the environment is becoming ever more eroded. Shifting the tax burden is the means proposed by the Swedish Society for Nature Conservation for relieving both unemployment and the pressure on the environment.

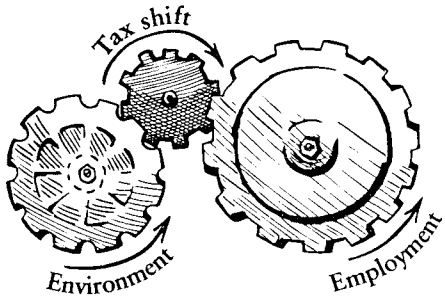
THE IDEA of lowering the taxes on labour and raising those for use of the environment has long been advocated by environmentalists and some political opinion. The idea gained momentum when Jaques Delors, as chairman of the EU commission, put it forward as a viable means of attacking unemployment and simultaneously saving the environment. Increased credibility followed as a result of its incorporation in an EU white paper on environment and employment, and the possibilities have been subject to official study in the Netherlands, Norway and Sweden.

It is becoming ever more evident that the environment is not being well managed by market forces – largely because the environment does not usually appear in economic assessments. As early as in 1920, however, the economist A. C. Pigou wrote that in order to conserve resources, a price would have to be put on it – arguing, in the language of economists, the need to "internalize external effects."

A negative external effect is something that affects a third party, for which that party receives no compensation – as when someone exploits a common resource to his own advantage. Pigou maintained that anyone destroying the environment should pay compensation, in the same way as one pays for labour. Not having to pay for using up some environmental resource is equivalent, he said, to making environmental destruction profitable.

Environmental resources are, or should be, common to us all, and one way of putting a price on their use would be to levy a tax on them. The aim should be to favour socially acceptable activities, involving the production of environmentally sound goods at affordable prices, instead of their being, as today, more expensive than others that are more harmful to the environment.

Although there are many ways of determining the proper tax levels, it is often necessary to start from po-



litically defined environmental objectives and then try to find the levels of environmental taxes that will be needed for the attainment of those objectives. In other words, an indirect pricing of the environment.

Even in Sweden – one of the OECD countries with most experience in this field – the history of environmental taxes only goes back as far as 1988, when the government appointed a commission on environmental charges. In 1990 the commission proposed the introduction of taxes on carbon dioxide and sulphur, and a charge on nitrogen oxides. A later tax reform, involving all told some 60 billion kronor, yielded 18 billion kronor in environment-related tax money which was used to lower the income tax. Half of the 18 billion kronor accrued from VAT being made payable on energy and environment taxes. By 1995 however environment taxes were contributing about 50 billion kronor to the exchequer, or, 6.1 per cent of total taxation and 3 per cent of the gross domestic product.

Today the taxes on energy and carbon dioxide account for 70 per cent of the environment-tax total. Industry has been granted certain exemptions: it does not have to pay any energy tax, and pays only 25 per cent of the general carbon-dioxide tax.

In 1996 the Swedish Society for Nature Conservation (hereafter SNF) produced its own proposal (see box)

SNF is suggesting transitional regulations for energy-intensive industries

for ecological tax reform. The new environmental taxes in its proposal are estimated to add some 44 billion kronor to net state revenue. The idea is that the change will have the result of:

☐ Creating opportunities for low-cost, cost-efficient environmental policy.
☐ Leading lifestyles into more environmentally acceptable ways.
☐ Repairing becoming cheaper, thus counteracting wasteful consumption.
☐ Making environmentally favourable actions and consumer habits worthwhile.
☐ Making the value of the environment economically visible by putting a price on it.
☐ Encouraging developments in new, green technology as well as investments in it.
☐ Making labour costs somewhat lower.
☐ Causing knowledge-intensive, environmentally matched production to become a growth sector in the economy.
☐ Making it rather more expensive for enterprises that pollute the environment and employ few people.

The new environment taxes are estimated to add 70 billion kronor to gross state income, from the present 50 to 120 billion kronor. They are expected to stimulate such new technical developments and changes in people's behaviour as will lessen the effects of human activity on the environment. But that will cause a relatively rapid decline in the revenue from environment taxes – more than 16 billion kronor – and with exemptions granted to energy-intensive in-

A Swedish tax shift: the SNF proposal

Carbon dioxide. Various exemptions mean that the present tax is not cost-efficient. Under the SNF proposal, all CO_2 emissions, except for especially energy-intensive industries, would be taxed equally. They will thus decline most where they are cheapest to control. The SNF proposal is to tax carbon dioxide at 50 öre per kilogram – later to be increased if long-term objectives are to be achieved. *Net revenue*: 14 billion kronor.

Nuclear power. Because of the dangers, parliament has decided a start should be made on decommissioning nuclear plants. Since it would seem reasonable in the circumstances to hasten the phase-out by increasing taxation, SNF is proposing a tax of 7 öre per kilowatt-hour of nuclear power, or about what the EU commission is proposing. *Net revenue*: 4.2 billion kronor.

General energy tax on electricity. At present several sectors are exempted from this tax. SNF is proposing increasing it overall by 10 öre per kWh, which in southern Sweden would mean a tax of 19 öre for all users except industry, which would pay 10 öre. Even so, Swedish electricity prices would still be among the lowest in Europe. *Net revenue*: 12.6 billion kronor.

Diesel fuel. The tax here is a combination of carbon-dioxide and energy tax. SNF's proposal is to raise the tax on carbon dioxide to 50 öre per kilogram of emission. It would also raise the energy tax by 2.04 kronor per litre. All told, this would mean increasing the tax on diesel fuel by 2.50 kronor per litre, with the carbon-dioxide tax included. *Net revenue*: 5.1 billion kronor.

Petrol. To make road traffic bear its costs, as aimed at in the parliament's 1988 traffic policy, SNF recommends raising the energy tax on petrol to 4.85 kronor/litre. Together with the proposed increase in the tax on carbon dioxide, this gives a total tax increase for petrol of 2 kronor per litre – to be imposed in annual increments of 40 öre. *Net revenue*: 6.4 billion kronor.

Nitrogen oxides. There is a charge, instead of a tax, on emissions of nitrogen oxides. At present it is 40 kronor per kilogram of nitrogen dioxide, levied only on emissions from large heating and power plants, manufacturing industries, as well as others having so far been entirely exempted. Under the SNF proposal, the charge would be changed to a tax, to be imposed on a greater number of emission sources, including industrial processes. During an introductory stage, the present charge/tax would remain at 40 kronor per kilogram of nitrogen dioxide. *Net revenue*: 1.8 billion kronor.

Sulphur. Coal, peat, and oil are now all taxed for sulphur – oil however only being taxed when the sulphur content exceeds 0.1 per cent by weight. SNF proposes extending the tax to other emission sources, and raising it from 30 kronor per kilogram of sulphur to 60 kronor. *Net revenue*: 1.2 billion kronor.

Among the Society's proposals are also landing fees for aircraft and taxes on waste, artificial manure, pesticides, and tapwater. And as a means of saving non-renewable resources for coming generations, there should be a "scarcity tax" on phosphorus and natural gravel.

☐

dustries the figure will come to some 25 billion kronor. So all in all the net extra revenue will, according to SNF estimates, amount to about 44 billion kronor.

There is an element of uncertainty in calculations of the effect of environment taxes on account of the rate at which emissions of pollutants can be forecast – in other words, how quickly the aims of the taxes will be attained and consequently how much the tax volume will be reduced within a given time. That volume will however settle relatively soon at some lower level – the level at which the marginal cost of reducing emissions still further exceeds the cost of continuing to pay the tax. In calculating the eventual total tax revenue, SNF has allowed for this so-called elasticity for various kinds of emission. The tax on carbon dioxide, for instance, is relatively unelastic compared with that on sulphur. This is because it is fairly simple to eliminate sulphur, whereas dealing with carbon dioxide calls for basic changes in the energy system.

The changes in people's behaviour, as well as technical progress, will be likely in time to cause emissions to drop still further. The figure for eventual tax income has therefore, for this and other reasons, to be a rough estimate.

Which taxes can be lowered, when environment taxes are raised, is an open question. In SNF's proposed tax shift the payroll levy could be reduced by 25 per cent, from the present 32.9 per cent to 24.9 per cent. The positive effect this would have on employment would not, however, be very great. It seems that for maximum effect, the reduction should be greatest for the lowest wage sectors – as has been confirmed in a recent study from the EU commission.

The chief beneficiaries of a tax shift would probably be labour-intensive activities that have little effect on the environment – such as engineering, welfare and other services, education, intellectual-property businesses, banking and postal services – which today employ about 80 per cent of country's working population.

A tax shift such as SNF is proposing could entail excessively high costs for some energy-intensive industries. These are relatively few in number, comprising for the most part metalliferous and non-metalliferous mining, iron and steel making, metal manufacturing, paper and pulp, and chemicals. Although they employ relatively few persons – only 230,000 or 5 per cent of the country's workforce – they account for a considerable share (25 per cent) of Sweden's export earnings, and are of great regional importance.

To prevent the whole business community and the taxation system from being dominated by the needs of a single sector, SNF is suggesting a variety of transitional regulations for energy-intensive industries. One way would be to combine existing concessions with the new environment taxes. Under such an arrangement an industry would be able to obtain a special concession applying to its energy consumption and emissions of carbon dioxide. To avoid the general tax on these, it would have to enter into an agreement setting the rate at which its energy use and emissions would have to be reduced.

This would enable the environmental effects of the relatively few energy-intensive industries to be controlled without impairing those industries' competitive capacity. This method SNF considers most deserving of further study if transitional arrangements turn out to be needed.

SVANTE AXELSSON

The author is an economist and director of the SNF program "Ett hållbart Sverige" (A sustainable Sweden). The society's proposals are set forth more fully in *Ecological Tax Reform. Tax Shift – a Tool to Reduce Unemployment and Improve the Environment*, which is obtainable from the Swedish Society for Nature Conservation, Box 4625, S-116 91 Stockholm, Sweden. Fax. +46-8-702 08 55.

Public transportation: City of the year

The 1996 European prize for excellence in public transport has been awarded to Strasbourg, France. The city, which is capital of the region of Alsace, has re-introduced trams, improved bus services, implemented new parking policies and reduced car traffic in the city centre by 17 per cent. The number of people using public transport has risen by 23 per cent. Second place went to Lindau in Germany and third to Innsbruck, Austria. Prize-givers were the Council of Municipalities and Regions of Europe and the European Association of Railway Journalists.

T&E **Bulletin** No. 55. February 1997.

Recent publications

Acid Rain and Environmental Degradation: The Economics of Emission Trading (1996)

By G. Klaasen. A state-of-the-art survey of the theory and practice of trading in emission permits. Examines Europe's acid-rain problem and discusses how tradeable emission permits can be used for dealing with it.

Published Edward Elgar Publishing Ltd, in cooperation with IIASA. ISBN 1 85898 489 0.

Lost in concrete: an activists guide to European transport policy (1996)

An exposé of European transportation policy and its consequences for health, environment, and the economy.

64 pp. Obtainable from A SEED Europe, P.O. Box 92066, 1090 AB Amsterdam, Netherlands. Fax +31-20-6650166.

Risk assessment – Health – Environment (1996)

Final report from a research project the aim of which was to develop models and methods for determining the risk to health from air pollutants.

52 pp. 88 kronor. Report No. 4595-4. Published by the Swedish Environmental Protection Agency, 106 48 Stockholm, Sweden. Fax +46-8 698 1515.

Swedish Environmental and Energy Cooperation with Estonia, Latvia, Lithuania, Poland and Russia (1996)

An account of the cooperation between various organizations in Sweden and the above countries concerning matters of the environment and energy.

38 pp. 90 kronor. Report No. 9773-3. Available from the Swedish EPA, address as above.

1979 Convention on Long Range Transboundary Air Pollution (1996)

Full texts of the Convention document and the associated protocols.

80 pp. Sales No. E.96.II.E.24. Can be ordered from the UN ECE, Sales Section, 1211 Geneva, Switzerland.

The State of Transboundary Air Pollution (1996)

Summarizes the national policy measures that have been taken to implement the protocols under the Convention on Long Range Transboundary Air Pollution. Also covers other multilateral and bilateral arrangements in the ECE region and related global concerns. Tables showing national emissions data and forecasts for SO_2, NOx, ammonia, VOCs and CO_2.

88 pp. Sales No. E.96.II.E.21. Available from UN ECE, address as above.

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ROAD PRICING

Profitable in many ways

IMPOSING CHARGES on inner-city traffic would be highly profitable for the community at large. In the absence of road pricing, Stockholm is now, according to SIKA, the Swedish Institute for Transport and Communications Analysis, losing between a half and a billion kronor a year in potential income.

The institute has studied the combined effect of three measures:

1. Charging for entry to each of five or ten zones into which the city would be divided (see AN 4/94). The income would be used to lower income taxes, either municipally or regionally.

2. Increasing the price of a season ticket for public transportation by 12 per cent (from 355 to 400 kronor per month).

3. Introducing more frequent services for public transportation to meet an increased demand following from road pricing.

By lessening inner-city traffic, these measures should produce tangible gains in the form of an improved environment (with reduced emissions, less noise, and so forth), and fewer accidents. With fewer traffic jams, more frequent services and a better average rate of travel for buses and trucks (leading in turn to a reduced need for vehicles and drivers), the economic effects would also be considerable. A general acceleration of economic growth is, according to SIKA, to be expected too – as a result of the lowered taxes and increased efficiency in the system.

It need not cost a lot to cleanse the air of Europe's cities. It may in fact turn out to be financially profitable. Well-designed measures aimed primarily at reducing traffic congestion – combined with modern vehicle and fuel standards – will, too, in many cases have the effect of bringing air pollution down to an acceptable level. Such is the writer's thesis, based on a Swedish investigation.

Even with no account taken of the external effects (better environment, fewer accidents, etc.), the result would, says SIKA, be a socio-economic surplus of more than 600 million kronor a year. If the external effects were also included, the sum would rise to 800 million kronor. "Whereas one has to talk of the cost to the community when considering the measures to attain a certain environmental improvement, road pricing would not only provide the desired improvement without cost, but actually ensure it at a profit," asserts the institute.

The SIKA study in fact brings out two fundamental problems involved in the effort to develop a more efficient and environmentally benign system for city traffic.

It is generally agreed that an ever-increasing volume of road traffic gives rise to adverse effects, especially in city centres, for which road users do not pay the price – with consequent economic loss to the community. In other words, road traffic does not get burdened with the external costs.

It should therefore cost more to drive vehicles in town than it does in the country. But instead of making driving dearer, the politicians have chosen to subsidize public transport heavily. Without those subsidies, there would be still more cars on city streets, with still more exhaust fumes, noise, traffic jams, and accidents.

Economically, this is of course a sheer catastrophe. Car use is being subsidized because it does not have to pay the external costs, and public

transportation has to be subsidized to enable it to compete with the under-paying car. With the cost for both modes thus kept unreasonably low, that for the community becomes unduly high. (It also discourages a more healthy way of getting about by bicycle or on foot.)

Inner-city charges are a means of making motorists more properly aware of what their journeys really cost. They will also encourage a greater use of public transportation, with the following consequences:

☐ Less reason to subsidize public transportation. Taxes can be made lower.

☐ More people using public transportation, making it possible and defensible to increase the frequency of the services and make life pleasanter for the users.

☐ Less traffic congestion when the average speed of passage for buses increases because other traffic has eased after the introducing of road pricing (in Stockholm bus speeds should increase by 17 per cent). Quicker travel for passengers, and shorter waits.

After considering various ways of disposing of the resulting income, the study proposes a tax switch, that is, transferring the money to the municipality or the county council, to enable them to lower other taxes.

The road charges could probably with advantage be set higher than the figures used in the SIKA analysis. To quote the report: "Higher charges, within certain limits, would be still more favourable to the users of public transportation, result in still greater gains in efficiency following tax reductions, and have a still greater environmental effect."

The conclusion must be that there is no contradiction between better air quality and improvements in local finance.

MAGNUS NILSSON

Editor of *Trafik & Miljö* magazine, and member of the board of T&E, the European Federation for Transport and Environment.

The SIKA report entitled *Samband mellan prissättning av bil- och kollektivtrafik* is in Swedish only, but has an English summary. It can be obtained from SIKA, Box 3118, 103 62 Stockholm, Sweden. Fax. +46-8-21 58 72. E-mail: sika@konj.se.

Get on your bike!

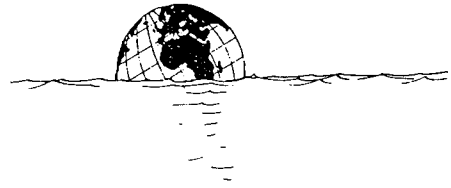
A bicycle uses no fuel, emits no exhaust fumes, is quiet, and takes up little road space. Not only does cycling provide useful exercise, but it will often shorten travel time as well.

In Germany and Denmark, bicycles are used for 11 and 18 per cent of all trips. The corresponding figure for Britain, according to a report from the Cyclists' Touring Club, is only 2 per cent, despite the favourable circumstances. Almost half of the trips people make in the UK are for less than 3 kilometres, and two-thirds for less than 8 kilometres. The makers of the report have attempted to figure out why the difference between the countries should be so great, and what steps will be needed to get people to bicycle more. They note some successful efforts that have been made in Europe to achieve this aim, and examine their worth.

More Bikes – Policy into Best Practice. By Don Matthew. 60 pp. £10.00. Avavilable from the Cyclists' Touring Club, 69 Meadrow, Godalming, Surrey, England GU7 3HS.

Great possibilities

According to the EU commission's business-as-usual scenario, emissions of carbon dioxide are likely to increase in the union by 7 per cent between 1990 and 2005, if no steps are taken to check them. It has however been shown in a study presented last December that they



could be reduced by 14 per cent in the same period if the EU as a whole were to put in force a number of measures that have already proved effective in one or more countries.

The study had been made in the science and technology department of Utrecht University in the Netherlands for the World Wide Fund for Nature (WWF). Its conclusion was that 653 million tons could be lopped off yearly from the emissions total by 2005, if the proposed measures were applied early in 1998 at the latest. Such a reduction would be equal to the present combined emissions of Spain, Italy, and Belgium.

The greater part of the reduction – or just over two-thirds – would be a result of improved efficiency in the production and use of energy, especially in power generation. Fourteen per cent would come from increased reliance on energy from renewable sources, and 7 per cent from an expansion of gas-fired cogeneration, although both WWF and the power industry would expect that last figure to be higher.

Further information: Andrew Kerr, WWF European Policy Office. Fax. +32-2-743 8819.

Further publications

IPCC Second Assessment Report

The second assessment report from the Intergovernmental Panel on Climate Change, presented in 1995, was published in 1996 in three parts.

Climate change 1995 - Science (Houghton et al. 584 pp. £23.95) is a comprehensive assessment of current scientific understanding of human influences on past, present, and future climate.

Climate change 1995 - Impacts, adaptations and Mitigation (Watson et al. 890 pp. £24.95) describes the consequences of climate change and reviews what is known, unknown, uncertain, and controversial, as well as the potential impacts and adaptation options in different ecosystems and socio-economic sectors.

Climate Change 1995 - Economic and Social Dimensions (Bruce et al. 464 pp. £20.95) addresses the costs, equity issues and policy instruments.

Published by Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge, England CB2 2RU. Fax +44-1223-315052.

Who is Who in the UNFCCC Process

Directory of delegates and observers at sessions of various bodies within the UN Framework Convention on Climate Change 1995-96. Also provides information on the status of ratification for each party, as well as information on national focal points.

Available from the UNFCCC Secretariat, P.O. Box 260124, D-53153 Bonn, Germany. Fax +49-228-815 1999.

Energy, Environment & Development (1996)

By J. Goldenberg. A study of the relationship between the consumption, development and environmental impact of energy, discussing general and specific policies to promote sustainable development.

£12.95. Available from Earthscan, 120 Pentonville Rd, London, England N1 9JN.

Memorandum on Transport and Environment to the Council of Ministers and the Dutch Presidency (1997)

A summary of the matters to which T&E, the European Federation for Transport and Environment, thinks the EU should give priority this half-year – such as the auto-oil program, CO_2 emissions from cars, and economic instruments.

14 pp. Can be obtained free of charge from T&E, Rue de la Victoire 26, B-1060 Brussels, Belgium. Fax. +32-2-537 7394.

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CLIMATE

Commitments agreed

ON MARCH 3 the EU environment ministers agreed that the aim in climate negotiations should be to strive for reductions of greenhouse gases in the industrialized countries by 15 per cent between 1990 and 2010. In aggregate however the commitments now made by the member countries amount to reductions of no more than 10 per cent. How to arrive at the remaining five per cent remains an open question.

The gases covered by the agreement are carbon dioxide, methane, and nitrous oxide – weighted to reflect their global-warming potential over a hundred-year period.

The Netherlands, which is the country now holding the chairmanship, had proposed previously to the meeting that reductions should be so spread among the members that by 2010 the total should amount to 15 per cent. But, as mentioned, with present commitments it would only be 10 per cent – since almost every country wanted a smaller share of the burden than the Dutch had expected of it.

Here follow the figures for each country, showing the reduction or increase in per cent, with the Dutch proposals in parenthesis.

Austria	-25	(-25)
Belgium	-10	(-15)
Denmark	-25	(-25)
Finland	0	(-10)
France	0	(-5)
Germany	-25	(-30)
Greece	+30	(+5)
Ireland	+15	(+5)
Italy	-7	(-10)
Luxembourg	-30	(-40)
Netherlands	-10	(-10)
Portugal	+40	(+25)
Spain	+17	(+15)
Sweden	+5	(+5)
United Kingdom	-10	(-20)

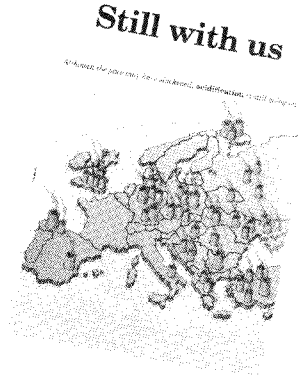
It is not certain whether the EU members will actually have to distribute the remaining five per cent among themselves, since the proposed 15 per cent reduction would only apply if all the industrialized countries were to adhere.

Both the overall EU target and burden sharing among member states will be reviewed after the Third Conference of the Parties to the Climate Convention in Japan next December.

Source: **Environment Watch: Western Europe.** March 7, 1997.

SPECIAL REPORT

Because sulphur is being emitted to the atmosphere at a somewhat slower rate than previously, people have tended to think that the danger from acidification is now over. But in fact the environment is still being affected, and the situation continues to get worse.



In the circumstances, where the dangers posed by acidification are seldom being brought to public attention, it has seemed opportune to the Secretariat to present an extensive résumé of the problem in all its aspects, in the form of this special report.

Single copies can be obtained free of charge from the Secretariat. Please call for quotation if more are required.

Coming events

North Sun '97. 7th International Conference on Solar Energy at High Latitudes. Helsinki, Finland, June 9-13, 1997.
Inquiries: Finnish Environment Institute. Fax +358-9-40300291.

EU Council of Environment Ministers. Luxembourg, June 19-20, 1997.

Third Pan-European Transport Conference. Helsinki, Finland, June 23-25, 1997.
Inquiries: Finnish Environment Institute. Fax. +358-9-40300291.

Ad Hoc Group on the Berlin Mandate. Bonn, Germany, July 28-August 7, 1997.

Meeting of the International Maritime Organization's Marine Environment Protection Committee. London, England, September 15-19, 1997.

International Conference on Air Pollution Prevention. London, England, September 22-26, 1997.
Inquiries: International Maritime Organization, 4 Albert Embankment, London, England SE1 7SR. Fax +44 171 587 3210.

Ad Hoc Group on the Berlin Mandate. Bonn, Germany, October 20-31, 1997.

International Symposium on Urban Air Pollution. Istanbul, Turkey, September 23-26, 1997.
Inquiries: World Meteorological Organization. Fax +41-22-7400984.

Regional Conference on Transport and Environment. Vienna, Austria, November 10-14, 1997.
Inquiries: UN ECE. Fax. +41-917 0123.

Third Conference of the Parties to the UN Framework Convention on Climate Change. Kyoto, Japan, December 2-13, 1997.

Executive Body for the Convention on Long Range Transboundary Air Pollution. Geneva, Switzerland, December 8-12, 1997.