

# Acid News

NO. 1, FEBRUARY 2003

## In this issue:

### Less sulphur at sea 4

As part of its shipping strategy, the Commission has published a proposal for reducing the sulphur content of marine fuels used in EU territory.

### Falling too slow 6

The emissions of carbon dioxide from new cars are becoming less in the EU, the question is whether they are doing so fast enough.

### Non-road engines 8

Without stricter standards, by 2020 the emissions of nitrogen oxides from non-road mobile machinery could exceed those from road traffic.

### CO<sub>2</sub> emissions trading 10

Trading in emissions permits will start in the EU in 2005. A proposal to the same end has appeared in the US too.

### Carbon intensity 15

While producing 50 per cent more power than its European counterpart, the US industry emits three times more carbon dioxide.

### On their way 16

The transportation system in the countries that are now on their way into the EU are becoming ever more like those of the latter.

### EU traffic taxation 18

The Commission wants to harmonize the taxes on fuel and to pave the way for a kilometre tax on heavy vehicles.

### Kola peninsula 22

Measures are finally being taken to cut down the enormous emissions of SO<sub>2</sub>.

## Factsheet

The Kyoto protocol is presented on pp. 11-14.



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AIR POLLUTION FROM SHIPS

## EU-wide strategy now published

A GENERAL STRATEGY for the EU to reduce the emissions of air pollutants from sea-going ships,<sup>1</sup> adopted by the Commission on November 20, contains a broad series of objectives, proposed actions and recommendations for bringing about such reductions over the next ten years. A proposal to extend the directive of 1999, on the sulphur content of certain fuels, to cover marine heavy fuel oil, was published on the same day as part of this strategy. Heavy fuel oil is the most widely used type of marine fuel (see separate article, p.4).

The atmospheric emissions from seagoing ships include, besides the traditional pollutants such as SO<sub>2</sub>, NO<sub>x</sub>, VOCs and particles, also greenhouse gases and ozone-depleting substances. Emissions from ships disperse to land, with effects both on human health and the natural and built environment.

The environmental effect as regards acidification and eutrophication is defined as the extent to which critical loads are exceeded, and maps are appended to show how much this is taking place in various parts of Europe. It is pointed out that in northern Europe there are large numbers of grid cells (areas of 50x50 kilometres) where ships' emissions are responsible for more than 90 per cent of the exceeding of the critical loads for acidity and eutrophication. In the south, it is the emissions of NO<sub>x</sub> from ships that are causing the concentrations of ground-level ozone to increase in the Mediterranean region.

Not only are some environmental problems such as ground-level ozone, eutrophication, and climate change becoming more serious, but a new awareness is developing as to the

*Continued on page 3*

## Acid News

is a newsletter from the Swedish NGO Secretariat on Acid Rain, whose primary 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 fulfill the purpose of Acid News, we need information from everywhere – so if you have read or heard about something that might be of general interest, please write or send a copy to:

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Published by: The Swedish Society for Nature Conservation

Printed by Williamssons Offset, Solna, on paper not bleached with chlorine.

ISSN 0281-5087

### THE SECRETARIAT

The Secretariat has a board 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 needed reductions in the emissions of air pollutants. The aim is to have those emissions eventually 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 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 information material.
- Supporting environmentalist bodies in other countries 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 Convention on Long Range Transboundary Air Pollution and policy initiatives in the European Union.
- Acting as an observer at the proceedings involving international agreements for reducing the emissions of greenhouse gases.

EDITORIAL

# Cost-effective to do it at sea

IT IS EVIDENTLY no easy matter to calculate the costs of measures for protection of the environment. And it seems to be especially difficult when it concerns lowering of the sulphur content in heavy bunker oils for ships. As reported in Acid News 3/02, Beicip-Franlab consultants have reported to the European Commission that the price difference between high-sulphur and low-sulphur bunker oil (with 3 per cent and 1 per cent sulphur) is on an average US\$19 per ton of fuel, which would mean a cost of about 400 euros per ton for reduced emission of sulphur dioxide.

The consultants note however that a marked increase in the demand for low-sulphur oil – as a result of various measures to protect health and the environment – would call for new investment at the refineries. Leaning on information from the oil industry, Beicip-Franlab concludes that the cost per ton of fuel would increase by 50 to 90 euros. At present a ton of heavy bunker oil costs around 100-120 euros.

Referring to Beicip-Franlab's estimates, the Commission has chosen in its Explanatory Memorandum (see p. 4-5) to take 50 euros per ton as the additional cost for lowering the sulphur content of European bunker oil from the present 2.9 to 1.5 per cent. That would correspond to 1800 euros per ton of eliminated SO<sub>2</sub> emissions, or more than four times the present market price difference.

What then does the oil industry say? As producer of the fuel it ought to know about the costs involved. A report of 1993 from its European environmental organization Concawe gives \$46-69 per ton as the extra cost of producing oil with a sulphur content of 1.5 per cent – largely the same as Beicip-Franlab's figures. It should be noted that Concawe's estimate is mainly based on data from the mid-eighties referring to a desulphurizing plant in Rotterdam, although with some updating to

1991. Concawe has moreover added a "capital charge" of 25 per cent, which has meant that capital costs have come to dominate in its estimates.

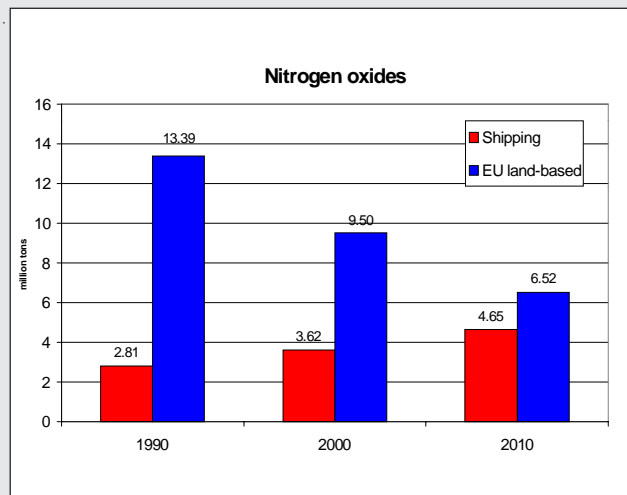
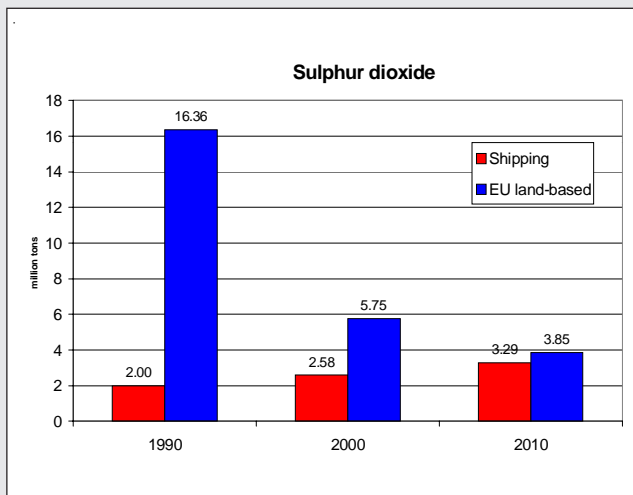
For the purposes of the Convention on Long-range Transboundary Air Pollution, as well as the EU's NEC directive, the RAINS computer model developed by IIASA has been used for analyzing the cost-effectiveness of various measures for reducing emissions. Those analyses took no account of the write-off periods desired by the oil industry, substituting instead an interest rate of 4 per cent on the capital costs.

Given these conditions, the cost of lowering ships' emissions of sulphur by reducing the sulphur content of bunker oils turns out to be about 500 euros per ton of SO<sub>2</sub>, which consequently is the figure used in the RAINS model. Thus the cost data used in cost-effectiveness modelling also emanates from the oil industry, and in for the analysis of the NEC directive, Concawe accepted that figure. It is moreover generally conceded that the same cost – 500 euros per ton of SO<sub>2</sub> – would be applicable for reductions down to about 0.6 per cent sulphur.

If the environmental targets agreed within the EU are to be attained, the emissions of sulphur dioxide from European shipping will have to be brought down by at least 80 per cent. It should therefore no longer be permitted to use marine bunker oils with a sulphur content of more than 0.5 per cent in European waters.

The Commission's analyses for the purposes of the acidification strategy and the NEC directive, have clearly demonstrated that to stop it would be cost-effective in itself as well as economically profitable for society.

CHRISTER ÅGREN



Emissions of sulphur dioxide (left) and nitrogen oxides (right) in 1990, 2000 and 2010. Those from land-based sources refer to the present EU and assume that all 15 member countries will fulfill their commitments under the national emission ceilings directive. Emissions from shipping are those from traffic in European sea areas (see AN 3/02). The projections for 2010 assume an increase in traffic by 3 per cent a year. Unit: million tons.

## Shipping strategy

Continued from front page

health effects of air pollutants, especially as regards fine particles. And with the abatement of the emissions of sulphur and nitrogen oxides from land-based sources, the volume from ships is becoming increasingly conspicuous. Such emissions in European waters are projected to be equivalent, by 2010, to more than three-quarters of the EU total for SO<sub>2</sub> from land-based sources, and to about two-thirds of that total for NO<sub>x</sub> (see charts above).

Since ships have so far been exempted in most EU legislation on emissions, they now offer a great scope for reductions. According to the Commission, the cost of reducing emissions from ships will now be considerably lower than that for further abatement on land. The strategy document includes a long list of actions that the Commission itself intends to take, as well as those it recommends to other parties. Here are some examples:

**INTERNATIONAL ACTION.** Within the International Maritime Organization the Commission will continue to press for tougher measures to reduce ships' emissions. It recommends member states to ratify MARPOL Annex VI as soon as possible, and to support a coordinated EU position

pressing for tighter international standards in regard to the global sulphur cap and NO<sub>x</sub> emissions.

**EU REGULATION ON EMISSION STANDARDS.** The Commission has published a proposal to amend directive 1999/32/EC so as to limit the sulphur content of marine fuels marketed and used in the EU (article p. 4). It has recently also put forward a proposal to amend directive 1997/

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*So far exempted from  
most EU legislation  
on emissions*

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68/EC on NO<sub>x</sub>, PM and CO emission standards for non-road engines marketed in the EU (article p.8), the aim being among others to extend its scope so as to make it include engines for use aboard vessels operating on inland waterways. Here it is a matter of the types and sizes of the engines to which the new standards are to apply, and whether they should also apply to smaller, mostly auxiliary engines intended for use in sea-going vessels.

As concerns global emission standards for ships' engines, if the IMO has not proposed tighter international standards for NO<sub>x</sub> by the end

of 2006, the Commission will consider bringing forward a proposal for reducing such emissions from sea-going vessels, in line with the proposed Tier 2 standards put forward by the US Environment Protection Agency.

**EU REGULATION ON ECONOMIC INSTRUMENTS.** Early this year the Commission will be proposing, in the context of an EU framework for infrastructure charging, the development of an EU system of differentiated charges for all modes of transportation, which will take into account the marginal social costs, including the external costs of air pollution and climate change. A charging scheme for maritime transportation will be part of that framework, and be developed on the basis of ships' environmental performance, including atmospheric emissions of SO<sub>2</sub>, NO<sub>x</sub>, PM, and CO<sub>2</sub>. Later, the Commission will be considering the possibility of developing an emissions trading regime (or regimes) to achieve incremental reductions in ships' emissions in EU sea areas, particularly for NO<sub>x</sub>. The feasibility of trading in ships' emissions will however first have to be demonstrated.

**VOLUNTARY MEASURES.** The Commission will launch a new Clean Marine Award Scheme to give publicity to EU companies and authori-

*Continued overleaf*



## Shipping strategy

Continued from previous page

ties that demonstrate best practice in low-emission shipping. It urges the international bunker industry to make available significant quantities of marine heavy fuel oil with a maximum sulphur content of 1.5 per cent in states bordering on SO<sub>x</sub> Emission Control Areas, and also to make available at least some marine fuel of any grade with a sulphur content of 1.5 per cent in all world bunkering ports, so as to be able to supply ships destined for an SO<sub>x</sub> Emission Control Area. The Commission urges port authorities to consider introducing voluntary speed reductions, and to require, facilitate, or provide incentives for ships to use land-based electricity or clean onboard power while in port.

**RESEARCH.** Under the proposed 6th Framework Programme, the Commission will continue to fund research into low-emission technologies for ships, such as selective catalytic reduction, humid-air motors, flue-gas desulphurization, and alternative fuels. It also hopes to fund a pilot project, under the LIFE environment program, to examine the practicalities of trading in ships' emissions. It will in any case hold an annual workshop on best practice in low-emission technologies for ships, in order to bring together researchers and disseminate the latest research findings.

The above strategy has been published in the form of a so-called communication, which means it will be subject to debate both in the European Parliament and the Council, giving room for an expression of views in both cases. That will likely occur during the first half of the present year. The accompanying proposal for a change in directive 1999/32/EC on the sulphur content of marine fuels will have to go through the usual EU procedure for this kind of legislation – in other words, codecision, which usually takes about two years.

CHRISTER ÅGREN

<sup>1</sup> Communication from the Commission to the European Parliament and the Council: A European Union strategy to reduce atmospheric emissions from seagoing ships. COM(2002) 595 final, volume I. Can be downloaded from: [www.europa.eu.int/comm/environment/air/transport.htm#3](http://www.europa.eu.int/comm/environment/air/transport.htm#3)



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SHIPPING

# Tighter limits for sulphur in fuels

AS PART OF ITS STRATEGY to reduce the atmospheric emissions from seagoing ships, the Commission has published a proposal<sup>1</sup> for reducing the sulphur content of marine fuels used in European Union territory. Its main aim is to lower the extent to which ships contribute to acidification and local problems of air quality.

In most of the coastal areas along the English Channel and the North Sea, in the Baltic along the coasts of Germany and Poland, as well as in large parts of Sweden and Finland, more than 50 per cent of the exceeding of critical loads for acidity is attributable, according to the Commission, to ships. Moreover, in most of the European coastal waters ships' emissions account for 20-30 per cent of the concentrations of secondary inorganic particles (PM). Secondary and primary PM, together with SO<sub>2</sub> and NO<sub>x</sub>, have adverse effects on human health throughout the EU.

Among the fuels used in the territory for which directive 1999/32/EC sets sulphur limits are marine gas oils and diesel oils used in inland waterways and territorial waters up to 12 nautical miles from shore. That directive also sets limits on sulphur

for inland heavy fuel oils and gas oils, but none on the sulphur content of marine heavy fuel oils.<sup>2</sup> The sulphur contents of liquid fuels used in road and non-road vehicles are prescribed in other directives.

The lack of limits on sulphur in marine heavy fuel oils means that relative to other types they now contain large amounts, their average content worldwide now being about 2.7 per cent, or 27,000 parts per million (ppm). The figure for heating oil in the EU is at the most 2000 ppm, and 350 ppm for diesel oil used in road transport. By 2005 the allowable maximum sulphur content of automotive petrol and diesel fuel will be 50 ppm, and 10 ppm by 2009.

Ships are now one of the largest sources of emissions of SO<sub>2</sub> in the EU. According to research recently made for the Commission, by 2010 emissions from ships are likely to reach something equivalent to 74 to 86 per cent of those from land, with all from mobile and stationary sources included (see AN 3/02, pp. 8-10).

The aim of the Commission's proposal is to reduce the emissions of sulphur dioxide and particulates by modifying the provisions of directive 1999/32/EC concerning the sulphur

content of marine fuels. Its main items are to:

- ◆ Introduce a 1.5-per-cent sulphur limit on marine fuels used by all sea-going vessels in the Baltic, the North Sea and the English Channel, in line with the sulphur limits of MARPOL Annex VI, in order to reduce the effect of ships' emissions on acidification in northern Europe and on air quality generally. This internationally agreed limit is intended to be implemented 12 months after the entry into force of the revised directive, or one year after that of Annex VI, whichever should be the earlier.
- ◆ Introduce a 1.5-per-cent sulphur limit on marine fuels used by passenger vessels in regular service to or from any Community port, in order to improve the quality of the air particularly around ports and coasts in the more populated urban areas of southern Europe, and create a sufficient demand to ensure an EU-wide supply of fuel with 1.5 per cent sulphur. To ease the effect on operators, it is proposed to allow a transition period ending July 2007.
- ◆ Amend the existing provisions for marine distillates used by sea-going and inland vessels by introducing an 0.2-per-cent sulphur limit on fuel used by ships at berth in ports within the EU, in order to reduce local emissions of SO<sub>2</sub> and PM and improve lo-

cal air quality. To this end, it is suggested firstly to ban the sale of marine gas oils (DMA and DMX grades) with more than 0.2 per cent sulphur, secondly to remove the 0.2-per-cent sulphur limit on DMB and DMC grades of marine diesel oil, and then ban the sale of such fuels with more than 1.5 per cent sulphur.

It is estimated that the combined costs, when all these measures have to be implemented (around 2006-08), will amount to about 1.1 billion

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*Additional cuts needed  
to protect health  
and the environment*

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euro a year. Taken together, the proposed measures are expected to have reduced the annual emissions of sulphur dioxide by more than 500,000 tons in 2006. In the absence of any abatement measures, by 2006 the emissions of SO<sub>2</sub> from international shipping in European waters have been projected to total between 2.7 and 3 million tons a year. The improvement in fuel quality will also result in lowered emissions of particulates and nitrogen oxides.

According to the analysts, only

some of the benefits of reduced emissions can be expressed in terms of money. Methodologies are as yet unavailable for monetizing for instance the effects on ecosystems of exceeding the critical loads for acidification, but where the benefits have been estimated, the Commission has taken into account the effects on human health as well as on crops and modern building materials. When all are added up, they are estimated to amount to 2.7 billion euros a year. It is in any case clear from the analyses that the benefits will significantly outweigh the costs in all aspects.

"Whilst the EEB welcomes the Commission proposal on limiting sulphur in ship fuels, we feel that it clearly does not go far enough," says Melissa Shinn, air pollution officer at the European Environmental Bureau. "Altogether, the measures proposed only result in total SO<sub>2</sub>-emissions reductions from ships of less than 10 per cent in comparison to year 2000 emission levels."

"In order to protect human health and the environment it is clear that significant additional cuts in European SO<sub>2</sub>-emissions are necessary. For shipping this means setting the maximum limit for the sulphur content of marine heavy fuel oil to 0.5 per cent, to be applied to all ships in all Community sea areas. This would reduce annual SO<sub>2</sub>-emissions from ships by about 80 per cent as compared to year 2000."

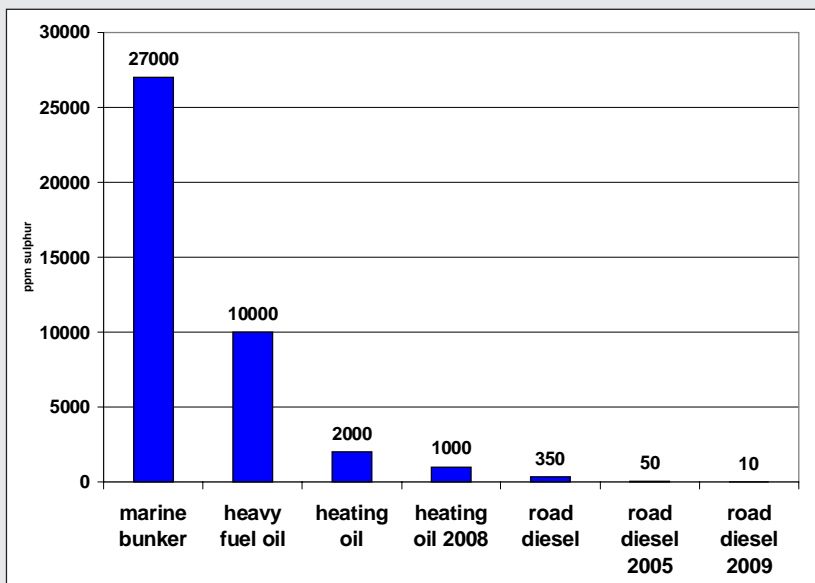
The proposal will follow the co-decision procedure of the EU legislative process, which involves both the Parliament and the Council and usually takes about two years to finalize.

CHRISTER ÅGREN

<sup>1</sup> Proposal for a directive of the European Parliament and of the Council amending Directive 1999/32/EC as regards the sulphur content of marine fuels. COM(2002) 595 final, 2002/0259 (COD), Volume II.

<sup>2</sup> The marine fuels at present covered by directive 1999/32/EC are all marine distillate fuels, comprising both the DMX and DMA grades, called marine gas oils, and the DMB and DMC ones which are known as marine diesel oils. In its present form the directive does not apply to the third and most widely used type of marine fuel: heavy fuel oil. It does currently require member states to ensure that the sulphur content of marine distillate fuels used by ships in Community territorial waters (seas 12 nautical miles from shore and inland waterways) will be 0.2 per cent or less (to be lowered further to 0.1 per cent by January 1, 2008).

**Fuels' sulphur content.** No limit for heavy marine fuel oils, the average sulphur content for which worldwide lies now around 27,000 ppm. For heavy oils used on land in the EU the limit is 10,000 ppm. Heating oil may now contain 2000 ppm, but in 2008 the limit will be lowered to 1000 ppm. The limit for diesel fuel used in road vehicles in the EU is now 350 ppm, but that too will be lowered to 50 ppm in 2005 and 10 ppm in 2009.

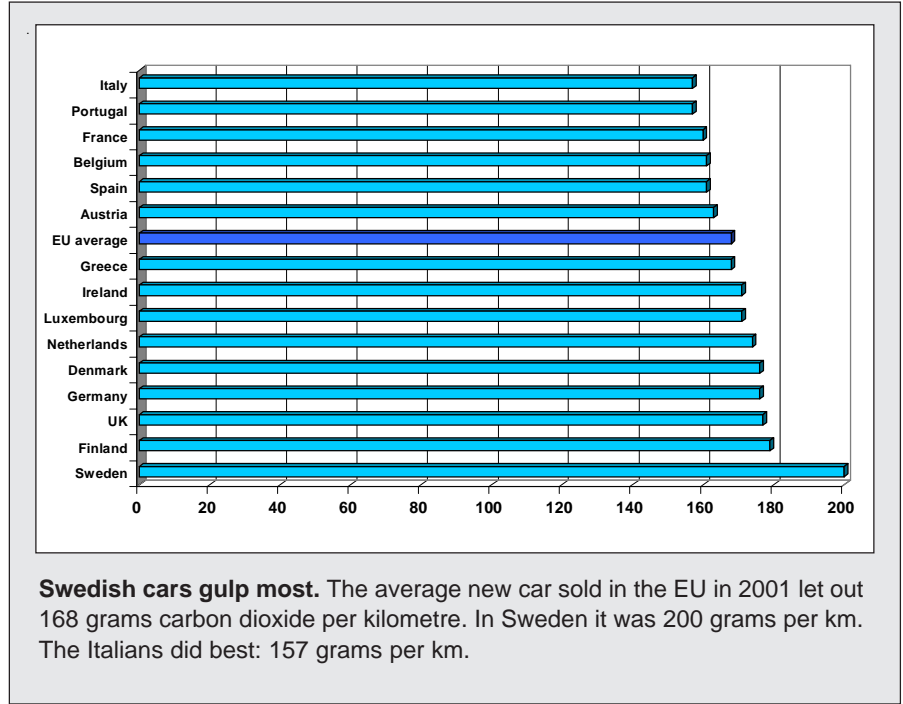


# Declining, but more effort will be needed to attain targets

THE EMISSIONS of carbon dioxide from new cars are becoming less in the EU. The question is however whether they are doing so fast enough. The carmakers had undertaken to reduce them by 25 per cent between 1995 and 2008-09, and according to the latest figures from the Commission, by 2001 they had fallen by 10 per cent. The Europeans and the Japanese appear to be on track to achieve the target, while the Koreans are lagging behind.

The gain so far is considered to be due mainly to improvements in fuel efficiency, especially for diesel, as well as increasing numbers of diesel-driven vehicles on the roads (which are more energy-efficient than petrol-fuelled cars, but emit more of other kinds of pollutant, in particular fine particles and nitrogen oxides). But other factors over which the carmakers have no control, such as rises in fuel prices and tax changes in some countries, may also have played a part in the present trend.

The Commission insists that more effort will be needed if the final target of 140 g/km is to be realized. This applies particularly to members of the KAMA (Korean) trade association, although the annual rate of reduction will have to be increased within the other two associations as well. For all three the average rate ought to



be 2 per cent, or about 4 g/km per annum. During the reporting period from 1995 to 2001 the average rate achieved in the European association, ACEA, was about 1.9 per cent a year, as against 1.5 per cent for the Japanese JAMA and 0.9 per cent for KAMA – although it was always anticipated that the average reduction rate would be higher towards the end of the period.

There is a reminder in the Commission's report that it intends to resort to legislation if the carmakers fail to live up to their commitment. In the coming year the Commission will in any case be starting negotiations with the manufacturers to settle on the commitments that are to apply when the present period has come to an end.

PER ELVINGSON

## Background

By agreement with the carmakers' associations in 1998, the Commission undertook to desist from legislation, provided the manufacturers really did reduce emissions voluntarily. The figure set was 140 grams of carbon dioxide per kilometre, as an average for all new cars sold within the EU. The target was to be reached by the European manufacturers in 2008 and by the Japanese and Koreans a year later. The average in 1995 was 186 grams per kilometre.

That agreement with the manufacturers is the principal component in the EU strategy for bringing down the emissions of carbon dioxide from new cars. Legislation helping to attain the EU target of 120 g/km by 2010 also exists in the form of compulsory labelling of new cars for fuel economy and CO<sub>2</sub> emissions, to ensure that the information is available to customers. Last year the Commission also produced a number of proposals for further fiscal measures, and more are awaited (see pp. 18-19).

## Better cars, more emissions

Although the fuel consumption of new cars is going down, emissions from road traffic are still growing. Between 1990 and 2000 those of carbon dioxide increased by 19 per cent in the EU, at a time when emissions from other sources were declining. For more about this, see pp. 16-17.



# Much less intended from paints and varnishes

IN A NEW MOVE, the Commission is proposing limits to the amount of solvent in paints, varnishes, and vehicle coatings.<sup>1</sup>

The limits are to be applicable in two stages. First from 2007, when they are to range 50 to 750 grams of solvent per litre of product (depending on type). Then from 2010 the lowest limit will be 30 grams per litre.

The directive is based on Article 95 of the EU treaty aimed at a harmonized market, which requires member states wanting to apply tougher standards to provide scientific justification for it.

The Commission estimates that, as a result of the directive, the emissions of volatile organic compounds will have dropped within the EU by 280,000 tons in 2010 (in 1990 they totalled 14 million tons). The largest source is wall paints.

The benefits to health resulting from reduced pollution are estimated to be worth 580 million euros, as against 108-157 million per year by 2010 for the cost of bringing about the reduction. The gain would thus be 4-5 times greater than the cost, even without the inclusion of various favourable items, such as the effect on ecosystems.

The proposal will now be subject to co-decision procedure between Parliament and the Council.

<sup>1</sup> **Proposal for a Directive of the European Parliament and of the Council on the limitation of emissions of volatile organic compounds due to the use of organic solvents in decorative paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC. COM (2002)750 final.** Available on Internet: [http://europa.eu.int/eur-lex/en/com/pdf/2002/com2002\\_0750en01.pdf](http://europa.eu.int/eur-lex/en/com/pdf/2002/com2002_0750en01.pdf)

## Subsidies listed

The EU Commission has now made, for the first time, a list of all the forms of government support to the energy sector, saying that it may "provide the starting point for a reform of national and EU aid schemes." It intends in continuation to consider whether certain sources of energy are being given advantages that do not conform to EU objectives for energy and combating of climate change.

In 2001, member states (Spain and Germany especially) had been subsidizing coal production to the extent of 6.3 billion euros. Lignite and peat mining were not subsidized, and oil production gets little or nothing in the way of state aid. For renewables, on the other hand, the plethora of support schemes makes calculation difficult.

The Commission has a broad interpretation of what constitutes a subsidy. It includes for instance the hidden subsidies to the nuclear industry in the form of curtailed responsibility for accidents.

*Environment Daily*, January 8, 2003.

## Controversy over biofuels

As expected, the Commission's proposal to increase the bio element in EU fuels to 2 per cent in 2005 and 5.75 per cent in 2010 was rejected by the Council of Ministers when arriving at a common position last November.

At a first reading, Parliament had agreed with the Commission in that the measure should be binding, but the ministers only wanted the figures to be indicative.

The matter will now be coming before Parliament for a second reading, but there seems to be little possibility of winning over the ministers, who are threatening to block a parallel directive, giving tax advantages to bio fuels, if they don't get their way. The legislative procedure spelt out in that directive calls for unanimity among the member states, allowing Parliament only a consultative role and voiding its power to force conciliation talks.

*Environment Daily*, November 19, 2002.

## Greece must lower

Last December the Commission rejected a Greek request to use the escape clause in directive 99/32/EC regarding the sulphur content of certain liquid fuels. If it had been allowed to do so, Greece would have been able – in contradistinction to all other EU countries – to go on using heavy fuel oil with a sulphur content up to 3 per cent after the directive's deadline at January 1, 2003. From that date the maximum level will be 1 per cent.

In rejecting the request, the Commission referred to studies showing "beyond reasonable doubt" that emissions from Greece were contributing to the exceeding of critical loads in Italy.

*Europe Environment*, January 10, 2003.



## "Sulphur-free" fuels for all vehicles

Conciliation has now brought Parliament and Council of Ministers together on the matter of a directive on sulphur-free fuels. Such fuels are to be generally available from January 1, 2005, and exclusively so after January 1, 2009.

Getting non-road mobile machinery (such as bulldozers) as well as farm and forestry tractors included in the new directive can be seen as a victory for Parliament. Before any final decision can be made, however, a review has to be presented by the Commission in 2005, when it will also be submitting a proposal for the next stage of emission standards for compression-ignition (diesel) engines for use in non-road applications.

Sulphur-free is defined as having a sulphur content of less than 10 ppm (parts per million). The limits for petrol and diesel fuel within the EU are now 150 and 350 ppm, but will be lowered to 50 ppm for both in 2005.

The new directive will now have to undergo a third reading in Parliament and Council before it can be formally adopted. In Parliament's case that should be during the March session.

# To cut non-road engine emissions

Without stricter standards, by 2020 their emissions of NO<sub>x</sub> could exceed those from road traffic.

A PROPOSAL came from the Commission in December to set stricter limits to the emissions of nitrogen oxides (NO<sub>x</sub>) and particulates (PM) from diesel engines for non-road mobile machinery. It is meant to update the existing directive (see box) and cover the engines used in a wide range of machines, for example in the construction industry.

Starting in 2006, it would cut the maximum allowable emissions of nitrogen oxides by 30-40 per cent, from present levels. In a second step, subject to confirmation in 2006, particulate limits would be lowered by 80-90 per cent as from 2011. Meeting this limit will necessitate using fuel with a sulphur content of no more than 10-50 ppm. The late date for implementation is due to the fact that the necessary fuel quality will not be available in the US before 2011.

The Commission says that because engines for non-road machinery are largely made for a global market, global alignment was practically a necessity for the directive. This explains why it follows, to a great extent, existing rules in the United States.

The Commission sees moreover the need for a review of technical feasibility. Particle filters will for instance have to be fitted, at least on certain types of engine, if the proposed emission limits are to be attained. The possibility of applying particle-trap technology in these cases will have to be investigated, which is one reason why a review of progress in the development of suitable technology in general will have to be made in 2006. Even stricter limits for NO<sub>x</sub> might be possible, too, if suitable after-treatment equipment is then available.

The proposed directive would include, for the first time, engines aboard vessels in traffic on inland waterways. In this case the limit values would be the same as in the US. It is suggested that they should



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be phased in during 2007 and 2008.

Without stricter emission standards for these types of engine, by 2020, the Commission warns, non-road mobile machinery will be responsible for even greater emissions of nitrogen oxides than road trans-

port, and nearly as much particulate matter.

CHRISTER ÅGREN

The proposed draft directive is available at: [http://europa.eu.int/eur-lex/en/com/pdf/2002/com2002\\_0765en01.pdf](http://europa.eu.int/eur-lex/en/com/pdf/2002/com2002_0765en01.pdf).

## Non-road mobile machinery

Directive 97/68/EC contains requirements concerning emissions of air pollutants from compression-ignition engines (diesels), intended for use in non-road mobile machinery with an engine power of 18-560 kilowatts. It set emission standards for introduction in two stages. Those of Stage I are already in force, while Stage II standards were to be phased in between December 31, 2000 and December 31, 2003. A proposal to amend this directive so as to include small spark-ignition (petrol) engines of 19 kW or less, as presented in De-

cember 2000, has already passed the EU decision-making procedure and been approved by Parliament and Council.

Emissions of air pollutants from farm and forestry tractors are the matter of another directive (2000/25/EC), with requirements largely similar to those now in directive 97/68/EC. When the emission standards of the latter have been amended, the limit values and implementation dates of 2000/25/EC are to be aligned without delay.





DENMARK

## Special tax proposed for mopeds

THE DANISH environmental assessment institute, IMV, is proposing that mopeds should be subject to a special environmental tax. There are about 160,000 of them in Denmark with engine ratings up to 50cc. They are mostly two-stroke types that let out a lot of poisonous exhausts, especially hydrocarbons and particles. According to the IMV, the emissions of hydrocarbons from mopeds are about 15 times greater per rider-kilometre than those from cars. Mopeds also account for about 1 per cent of all the emissions of particulates from road traffic in Denmark.

Nor is their fuel efficiency especially remarkable. Considering that a car carries on an average 1.6 per-

sons and a moped only one, fuel consumption will be about the same, assuming that the car is a fairly new model and reasonably fuel efficient. Mopeds are moreover over-represented in accident statistics. The IMV has calculated that mopeds cost Danish society 1.3 billion kroner (170 million euros) a year – or about Dkr 8000, 1100 euros, per moped – from accidents, 1.0 billion, and air pollution, 0.3 billion kroner.

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*More in Knallerter. Samfunds- og miljøøkonomiske fordele og ulemper.* IMV December, 2002. In Danish, but with an English summary. Can be downloaded from [www.imv.dk](http://www.imv.dk)

### As it is now

The first EU directive for curbing the emissions of air pollutants from two-wheeled vehicles was agreed in 1997 and came into effect in 1999 (97/24/EC).

There was one limit level for motorcycles and two for mopeds, with stage 2 for mopeds starting in 2002. Since a second stage was already decided for mopeds, they were not included in the revised directive that was agreed in 2002, involving a

tightening of the emission limits for motorcycles in two stages, 2003 and 2006.

Under present rules, as from 2002 emissions of hydrocarbons from mopeds may not exceed 1 gram per kilometre – a good deal less than the amount older models let out (up to 5 grams), but a lot more than 0.2 gram which is now the limit for petrol-driven cars (and will moreover be lowered to 0.1 gram in 2005).

CONTROVERSIAL BOOK

## Errant author repudiated

AN OFFICIAL scientific ethics panel in Denmark has ruled that Bjørn Lomborg “perverted the scientific message” in his book *The Sceptical Environmentalist*, which disputes the seriousness of many key environmental problems.

Lomborg’s book came out in several languages and was published in English by the Cambridge University Press in 2001. Its thesis is essentially that world environment has not got worse but has actually improved in later years, and that environmentalist organizations are making “selective and misleading use of scientific data to influence decisions about the allocation of limited resources.”

Lomborg’s ideas received a lot of attention, even in *The Economist*. But they have also come in for some heavy criticism, for instance in the *Scientific American*, which gave space for critical reviews by four leading scientists.

And now the Committee on Scientific Dishonesty at the Danish Research Agency has also entered on the scene, averring that Bjørn Lomborg, associate professor of statistics at the University of Aarhus, and also head of the Environmental Assessment Institute (IMV), has acted “clearly contrary to the standards of good scientific practice.”

For further information see the

**DCSD ruling** (in English): [www.forsk.dk/uvvu/nyt/udtaldebat/bl\\_decision.htm](http://www.forsk.dk/uvvu/nyt/udtaldebat/bl_decision.htm)

**Scientific American:** [www.sciam.com/article.cfm?articleID=00000B96-9517-1CDA-B4A8809EC588EEDF](http://www.sciam.com/article.cfm?articleID=00000B96-9517-1CDA-B4A8809EC588EEDF)

# Generally agreed for carbon dioxide

THE COUNCIL OF MINISTERS has in principle approved the Commission's proposal for rules concerning trading in emission permits for carbon dioxide, but many important details remain to be sorted out with the EU Parliament.

Both are agreed that an EU trading system should be started in 2005 and continue as a trial until 2008, when an international system will be due under the Kyoto protocol. They differ however in certain essentials.

In the first place both Council and Commission only want trading in carbon dioxide, although they might agree to member countries seeking permission from the Commission to include other gases. But at its first reading Parliament proposed that all six gases of the Kyoto protocol should be included.

Parliament would also like 15 per cent of the permits to be auctioned off instead of being distributed free, while the ministers would prefer to let all permits be free of charge during the first part of the EU trial period up to 2007, and 10 per cent auctioned off thereafter.

It will be of great importance to decide how permits are to be allotted. If they are handed out free on the basis of companies' present or historic emissions, those that have taken steps to reduce emissions would be disfavoured, while the profligates would gain. Most environmentalists think that if trading should be used, all the permits should be sold, since that would make for more just allotments and enable new enterprises to compete on an equal footing with already existing ones. The ministers have asked the Commission to work out criteria for allocations as a guide to member states and have them ready next December.

Opinion also differs as to the possibility of exempting individual plants or whole industrial sectors from the trading rules during the proposed trial period. The ministers have taken a common position to the effect that exempted plants must commit to equivalent emission cuts

and be subject to the same reporting and verification requirements, with equivalent penalties for non-compliance, as those within the trading scheme. For its part the Commission would retain the right to veto opt-outs.

The ministers would accept pooling, allowing several companies in the same business to obtain a common allocation instead of being given individual ceilings.

They also say that linking EU emis-

sions trading to the joint implementation scheme and the clean development mechanism of the Kyoto protocol, by allowing firms to buy credits from those last, would be "desirable." The Commission is to work out a separate draft directive for this purpose.

The directive will now be going to parliament for a second reading.

*Source: Environment Daily, December 9, 2002.*

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UNITED STATES

## May extend it to carbon dioxide?

TRADING in emission allowances for sulphur dioxide having worked well, in the view of many in the United States, since it started in 1995. It is now thought that a similar system could be used for carbon dioxide, and a bill to that effect has just been presented before Congress by two senators, the Democrat Joe Lieberman and the Republican John McCain.

The bill aims at bringing back US emissions in 2010 to their level in 2000, and by 2016 through further reductions to the level obtaining in 1990. It would apply to emissions from the electricity generating, petroleum refining, and industrial and commercial business sectors, which together account for 85 per cent of all US greenhouse-gas emissions. It would apply to all entities that emit more than 10,000 metric tons of greenhouse gases per year, and therefore would not apply to individual car owners, homeowners, or the agricultural sector.

The idea is that the Secretary of Commerce shall determine the number of emission allowances each company is to receive free of charge, and how many are to be auctioned off.

The bill mentions several ways by which an individual company could keep under its emission ceiling. It could cut emissions so as to reduce the allowances it would otherwise require, or purchase other companies allowances to offset a continued excess of emissions. It would also be allowable to satisfy up to 15 per cent of the needed emission reductions by submitting tradeable allowances from another nation's market in greenhouse gases, or by contributing to projects that sequester carbon-dioxide emissions.

It remains to be seen what sort of reception the bill will get in the Republican-dominated Senate, although the fact of its being sponsored by a respected Republican gives reason for hope as to the outcome.

Environmentalist organizations are widely supportive, many of them maintaining that measures to reduce emissions will benefit the American economy, since they will act as a stimulant to fresh thinking and inventiveness.

*Source: Environment News Service (ens-news.com), January 8, 2003.*



Environmental  
Factsheet No. 12  
February 2003

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## CLIMATE CHANGE



# The Kyoto Protocol

– *What just is in it* –

The basis of international policy for cutting down emissions of greenhouse gases is the UN Framework Convention on Climate Change, which was signed by some 150 nations in the course of the United Nations conference at Rio de Janeiro in 1992. Coming into effect in 1994, by January 2003 this convention had been ratified by 187 parties.

It has as an “ultimate objective” the stabilizing of greenhouse-gas concentrations in the atmosphere “at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system.”

What that level should be is not indicated. The text merely says that it “should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic

development to proceed in a sustainable manner.”

It is a stated principle of the convention that the industrialized nations, being responsible for by far the greatest part of the emissions, both now and in the past, should take the lead in combating climate change and its damaging effects. It also lays down that any measures that may be taken should be cost-effective, thus allowing room for joint implementation and emissions trading.

### **Non-binding commitments**

This framework convention calls for no legally binding commitments on the part of the signers. The so-called Annex I countries do however have a non-binding aim to have returned their emissions of greenhouse gases to 1990 levels by the year 2000. These countries, now numbering 41, include members of the former eastern block besides the or-



dinarily recognized industrialized ones. Far from all succeeded in that aim. It could however be said that it was attained if the group's emissions are reckoned as a whole – largely because emissions dropped by almost 40 per cent in the countries with economies in transition.

**Binding commitments came at Kyoto**

A first step towards quantified commitments as a means of attaining the aim of

the climate convention was taken when the Kyoto protocol was signed in 1997.

Under this protocol the industrialized nations have made legally binding undertakings in regard to their emissions of greenhouse gases for the period 1990 to 2008-12. Some countries will be allowed to increase their emissions, or freeze them at current levels, but most will have to make reductions (see Table 1). The overall reduction for the Annex I countries is

expected to be 5 per cent. The way the EU countries have agreed to share out their common undertaking appears from Table 2.

Emissions from aviation and marine bunker fuels used in international transport do not enter into any national undertakings.

The protocol embraces six greenhouse gases which are combined in a “basket” where individual gases are translated into



Net take-up of carbon by trees and soil can be used as a set-off against emissions of carbon dioxide from the burning of fossil fuels or used in emissions trading – although only up to a limit set for each country in the Kyoto protocol.

**Table 1. Commitments under the Kyoto protocol. Required changes from 1990 to 2008-12.**

**Increases:**

- +10% Iceland
- +8% Australia
- +1% Norway

**Freezing:**

New Zealand, Russia, Ukraine

**Reductions:**

- 5 % Croatia
- 6 % Canada, Hungary, Japan, Poland
- 7 % USA
- 8 % EU (collectively), Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Liechtenstein, Monaco, Romania, Switzerland, Slovakia, and Slovenia.

**Table 2. EU internal burden sharing under the Kyoto protocol.**

|                 |            |
|-----------------|------------|
| Austria         | -13%       |
| Belgium         | -7.5%      |
| Denmark         | -21%       |
| Finland         | 0%         |
| France          | 0%         |
| Germany         | -21%       |
| Greece          | +25%       |
| Ireland         | +13%       |
| Italy           | -6.5%      |
| Luxembourg      | -28%       |
| Netherlands     | -6%        |
| Portugal        | +27%       |
| Spain           | +15%       |
| United Kingdom  | -12.5%     |
| Sweden          | +4%        |
| <b>EU total</b> | <b>-8%</b> |

CO<sub>2</sub> equivalents which are then added up to produce a single figure.

The base year against which the reductions of the main greenhouse gases – carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) – will be measured is 1990, except for some countries with economies in transition, and reductions in the emissions of three long-lived industrial gases – hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF<sub>6</sub>) – against either 1990 or 1995. (A major group of powerful greenhouse gases, chlorofluorocarbons or CFCs, is regulated under the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer.)

The protocol emphasizes that “demonstrable progress” towards meeting its aim must have been made by 2005, and reports with evidence of it submitted by January 1, 2006. Talks on targets for the

second commitment period must start by 2005.

#### **Details fixed at Bonn and Marrakech**

The negotiations at Kyoto were so long-drawn-out that when the meeting ended and the protocol had been signed, some unresolved matters still remained. There had been especial difficulty in arriving at rules for the use of flexible mechanisms and carbon sinks, and further meetings had to be held to determine how the protocol was to be interpreted and how it was to function in practice. Much of this was decided at Bonn and Marrakech during the summer and autumn of 2001.

**FLEXIBLE MECHANISMS.** These include permit trading and the possibilities for any country to pay for reducing emissions in another and count the result to its own score (see factfile below). As several of the parties, including the EU, wanted

to limit the possibilities of using flexible mechanisms, it was finally decided that if used they should be “supplemental to domestic action,” and that such action must constitute “a significant element” of the effort to meet commitments. No limit was however set for the extent to which these mechanisms could be employed.

**CARBON SINKS** concern measures such as afforestation and reforestation aimed at increasing nature’s ability to bind carbon. Many countries wanted to have it made possible to account any increased take-up of carbon in trees and soil as a reduction of their emissions. A telling objection to this is the difficulty of measuring the net effects of any such project. It was however decided that sinks could be used up to the limit set for each country in a separate table, although concessions that had to be made to Russia,

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#### FACTFILE

## *Flexible mechanisms*

The flexible mechanisms are intended to make it easier for countries to fulfill their commitments to reduce emissions. While the climate effect will be the same no matter where emissions take place, the cost of reduction will vary considerably from one locality to another. The three kinds of mechanism are described further on.

Flexible mechanisms are among those parts of the protocol which, besides carbon sinks, have been most criticized by environmentalists – who consider there to be a risk of the necessary changes in the rich countries’ energy and transportation systems being delayed, since they will be able to buy emission permits from other countries.

A lot of the emission permits consist moreover of what is called “hot air.” Russia and eastern European countries now emit very much less than they did in 1990, the base year, because great parts of their energy-intensive industries were shut down after the fall of the iron curtain and the Soviet Union’s dissolution. If their surplus permits are bought up by other countries, the result could be an increase of emissions in some country for which there would be no corresponding reduction in another.

Another matter of criticism has been

the difficulty of accurately measuring the effects of various projects. Is an Annex I country for instance to be allowed credit for having helped a developing country to effectivize, when the latter might soon have done so in any case?

**Emissions trading.** In this way Annex I parties may acquire assigned amount units (AAUs) from other Annex I parties. Such parties may also acquire CERs (from CDM projects), ERUs (from joint implementation projects), or RMUs (removable units from sink activities) from other Annex I parties. International trading under the Kyoto protocol can start in 2008.

CERs: certified emission reductions.

CDM: clean development mechanism.

ERUs: emission reduction units.

**Joint implementation** allows Annex I parties to implement projects to reduce emissions, or increase removals by sinks, in the territories of other Annex I parties. Emission-reduction units generated by such projects can then be used by the investing Annex I parties to help meet their own emissions targets. To avoid a double reckoning, a corresponding subtraction is made from the emissions figure granted to the benefiting country. Joint implementation projects are most likely to take place in countries with economies in transition,

where there tends to be more scope for cutting emissions at low cost.

**Clean Development Mechanism** allows Annex I parties to implement projects that reduce emissions in the territories of non-Annex I parties. The CERs generated by such projects can be used by the Annex I parties to help meet their emission targets, while also helping non-Annex I parties to achieve sustainable development and thus contribute to the ultimate aim of the convention.

The mechanism is intended primarily for projects that will reduce emissions. Rules are however being developed to include afforestation and reforestation during the first commitment period. There is a limit as to how much Annex I parties may use sink projects for achieving their targets: 1 per cent of the party’s emissions in the base year for each of the five years of the commitment period.

A CDM project might for instance involve a rural electrification scheme using solar panels, or reforestation of degraded land. As in the case of joint implementation projects, CERs arising from the use of nuclear energy may not be used to meet emission targets.

Canada, and Japan have meant that these countries will now be able to use sinks to a greater extent than other countries.

**SANCTIONS.** A party failing to meet its commitments will have its emission quota reduced for the following period by the overrunning amount, plus an extra 30 per cent.

**AID TO DEVELOPING COUNTRIES.** Parties to Annex II (Annex I countries minus those of the former eastern block; in other words the OECD countries) are committed to providing financial resources, as special funds, to help non-Annex I countries to meet their commitments under the protocol.

**BANKED EMISSIONS.** A party achieving more substantial cuts in its emissions than required may, subject to certain limitations, carry over the difference to the next commitment period. Credits earned from the use of sinks cannot be so carried over, and credits obtained from joint implementation projects and through use of the clean development mechanism (see factfile) can only be carried over to the extent of 2.5 per cent of the initial assigned amount.

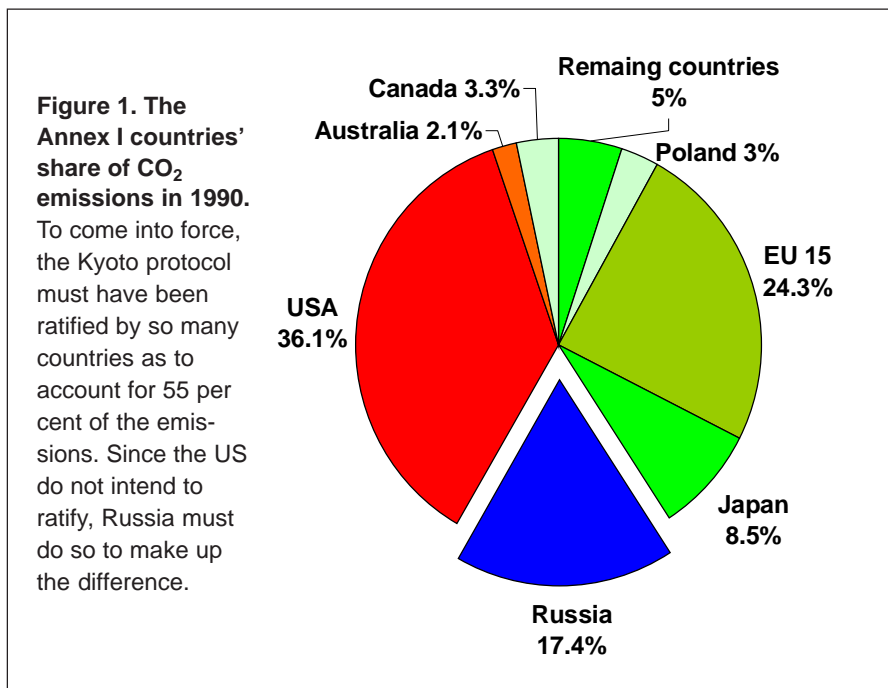
#### US opts out

The United States – which answered for a good third of the Annex I countries' emissions in 1990 (see Figure 1) and has the world's largest emissions per capita – abandoned the protocol in March 2001, with the excuse that it excluded 80 per cent of the world's population and would, moreover, be detrimental to the US economy. In February 2002 President Bush presented a national policy on climate change, with voluntary targets that are likely to lead to an increase in emissions of more than 30 per cent over 1990 levels by 2010.

The US withdrawal means that the Annex I countries' total emissions will not decline as envisaged, and that the protocol will have to be ratified by almost all the other Annex I countries if it is to be legally binding. It will come into effect after it has been ratified by at least 55 parties to the convention, including Annex I countries representing at least 55 per cent of the carbon dioxide emissions in 1990 from this group. It now only needs Russia to ratify – which it has repeatedly promised to do. Without Russia or the US, there can be no coming into force.

#### Watered-down commitments

If countries should choose to utilize carbon sinks to the extent permitted under



the protocol, the overall reduction of emissions during the 20-year period would not come to 5 per cent but only return to zero or even rise a few per cent. Use of the flexible mechanisms might also make it possible for individual countries to increase their emissions and yet meet their commitment.

#### Continuous negotiation

The parties to the convention meet regularly at the Conference of the Parties of the Convention (COP), which is also the venue of the Meeting of the Parties (MOP) to the protocol. Parties to the convention that are not parties to the protocol can participate in protocol-related meetings as observers.

It is said in the protocol that negotiations concerning the next period for commitments (after 2012) must start at the latest by 2005, but no directions are given for this. So far most of the developing countries have rejected all suggestions they should cut emissions, maintaining that it is the rich countries that have caused the problem and should therefore be the first to be required to deal with it.

But the developing countries' emissions are increasing, so that after no more than a few decades emissions from rich and poor will be about equal. The Annex I countries are most likely to demand some form of binding commitment from the developing ones for the period after 2012.

It will be important to decide how reductions are to be distributed. It might be better, instead of overall percentual fig-

ures, to take emissions per inhabitant as the measure. If all individuals were allotted an equal volume of emissions – as might seem reasonable – the industrialized countries would have to reduce their emissions a great deal, while many developing countries could be permitted a slight increase.

#### Sights need setting higher

No diminishing of greenhouse-gas emissions will result from the Kyoto protocol. Even if it should in the end lead to a reduction of 5 per cent from the industrialized countries, that would only mean that the speed at which concentrations in the air is increasing would be lessened by 4-14 per cent.

The commitments made at Kyoto, with subsequent waterings down, thus appear distinctly modest – although it must be added that in the past all international agreements concerning the environment have set off falteringly, but gradually taken firmer shape.

#### More information

More about the climate convention and the Kyoto protocol can be found on the convention's website [www.unfccc.int](http://www.unfccc.int). Besides general information this gives the complete texts, a list of the countries that have ratified, and a mass of data about the participating countries, which are obliged under the convention and the protocol to report on emissions to the convention's secretariat (yearly in the case of the Annex I countries).



# Europeans are more efficient

While producing 50 per cent more power than its European counterpart, the US industry emits three times more carbon dioxide.

THERE ARE GREAT differences in the amount of carbon dioxide emitted per unit of energy, not only between power generators in Europe but also between Europe and America.

Data on the 25 largest power producers in Europe (excluding Poland) collected by PricewaterhouseCoopers and the French daily newsletter *Enerpresse*, has been used to compare them with each other and with the results of a similar study made in the US.

It is hardly surprising to find that differences in fuel mix have much to do with the amount of carbon dioxide that is released per unit of energy produced (see chart below). Those companies that emit most use a large proportion of coal and lignite for their production of electricity. But in the EU only Hidrocantabrico in Spain, the Greek Board DEI, the Danish utility Elkraft, and German RWE show an emission factor exceeding 700kg CO<sub>2</sub>/MWh. And there are two companies depending only on hydro or nuclear generation, Statkraft (Norway) and British Energy, with zero emissions.

There are significant differences

in the way electricity is produced in the EU and the US. While producing 50 per cent more power than its European counterpart, the US industry emits three times more CO<sub>2</sub>. The ten largest European companies generate 35 per cent more power than the ten largest American ones, but emit 35 per cent less CO<sub>2</sub>. The aver-



age US carbon factor is as much as 720 kg/MWh, more than twice the European average of 353 kg.

The differences, according to PricewaterhouseCoopers and *Enerpresse*, are ascribable a couple of key factors:

**FUEL MIX.** More than 50 per cent of the electricity used in the US is

generated from coal, as against 35 per cent in the EU. The difference can mostly be ascribed to a greater use of nuclear power in Europe (33 per cent, 20 in the US).

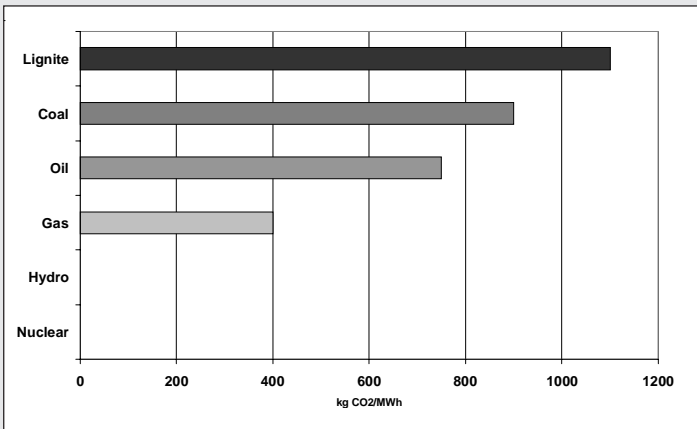
**EFFICIENCY.** The average efficiency of European plants is 10-25 per cent higher than that of their US counterparts.

Despite increased power consumption during the nineties, the use of coal declined in Europe as production from gas, hydro and nuclear sources increased. The rise in consumption in the US was met up to 40 per cent by the use of extra quantities of coal, 35 per cent more gas, and 25 per cent more nuclear generation.

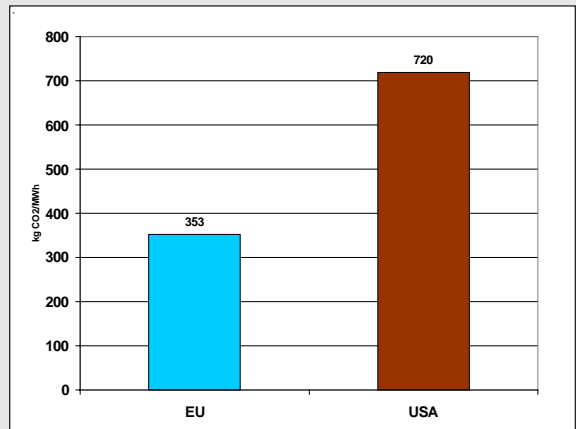
The report also reveals a great concentration of ownership in power production. In Europe seven large companies answer for as much as 70 per cent of the total.

PER ELVINGSON

*Source: European Carbon Factors: A Benchmarking of CO<sub>2</sub> Emissions by the Largest European Power Producers.* By PricewaterhouseCoopers and *Enerpresse*, 2002. Available at [www.pwcglobal.com/fr/pwc\\_pdf/pwc\\_europe\\_carbon\\_factor\\_2002-10\\_en.pdf](http://www.pwcglobal.com/fr/pwc_pdf/pwc_europe_carbon_factor_2002-10_en.pdf).



Amounts of carbon dioxide emitted per unit of energy produced (kg CO<sub>2</sub>/MWh). Average for the European plants in the study. In the production of electricity only, not all stages of lifecycle.



Average carbon intensities in the power sectors of the EU and the US. The difference can be explained in part by different fuel mixes, in part by greater efficiency in European power production.

# Changes in the accession countries

The transportation system in the countries that are now on their way into the EU are becoming ever more like those of the latter and ever less sustainable.

THE COUNTRIES seeking membership of the EU have now been included, for the first time, in the annual survey of the environmental aspects of transportation<sup>1</sup> made by the European Environment Agency, EEA.

It is hardly an encouraging document. Although the transportation system in the accession countries<sup>2</sup> is still in many ways more sustainable than that of the EU, "this favourable position is fast changing," says the EEA.

Statistics now show the transport volumes in these countries, which fell off significantly as a result of the economic recession of the early nineties, to be rising again as their economies recover. By 1999 they were almost back at their 1990 levels, and the trend is expected to continue.

The modal split – although still much better in the accession countries than in the EU – is pointing away, just as it is in the EU, from the

objectives of the EU sustainable development strategy to decouple transport growth from economic growth, and shift from road to rail, water, and public transportation.

Energy consumption – in particular the consumption of fossil fuels –



is a major policy concern, since it is closely linked to the emissions of greenhouse gases and the security of the energy supply. In the accession countries the share of energy consumed by transportation in total final energy consumption is 19

per cent. In the EU it is 34 per cent.

Transport energy consumption per capita – and associated emissions of greenhouse gases – in the EU is around three to four times higher than in the accession countries. In both regions the transport sector is the fastest-growing consumer of energy, having increased by about 22 per cent between 1992 and 1999 in the thirteen accession countries and 17 per cent in the EU. Road transport consumes most energy in both cases.

A positive trend – one of the few noted in the survey – is that the emissions of acidifying, ozone-forming and unhealthy substances receded in the course of the nineties, on an average by about a quarter both in the EU and the accession countries. Some countries have a reverse trend – in the EU they increased in Ireland, Greece and Portugal, among the accession countries in Turkey, Cyprus,

## A selection of key messages

### Is the environmental performance of the transport sector improving?

- ☹ Energy consumption in transportation is increasing rapidly, mainly as a result of growth in road transport.
- ☹ Transport emissions of CO<sub>2</sub> in the accession countries dropped in the early 1990s, but are now growing as traffic volumes increase.
- ☺ Accession countries' emissions of air pollutants from transportation dropped at the beginning of the 1990s, and have since stabilized.
- ☹ Urban air quality is improving but urban populations are still exposed to pollution levels that pose health risks.

### Are we getting better at managing transport demand and at improving the modal split?

- ☹ Freight intensity in the accession countries is falling, but is still on average five times higher than in the EU.
- ☹ Freight in the accession countries is shifting to road.
- ☹ Passenger transport is shifting to road and air.

### Are we moving towards a fairer and more efficient pricing system, which ensures that external costs are internalized?

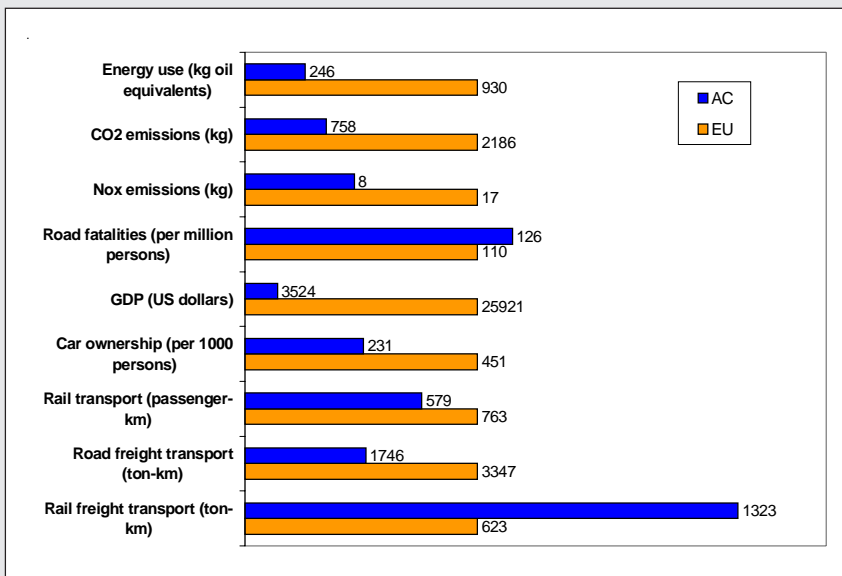
- ☹ Trends in fuel prices are not encouraging the use of more fuel-efficient transport modes.

### How rapidly are cleaner technologies being introduced and how efficiently are vehicles being used?

- ☹ Uptake of vehicle and fuel standards is improving, but the share of cars with catalytic converters is still low in accession countries.

### Are environmental-management and monitoring tools being used effectively to support policy-making?

- ☹ Integrated transport and environment strategies are lacking in accession countries.
- ☹ A few accession countries have legal requirements for strategic environmental assessment, but application in the transport sector is limited to pilot initiatives.



**The EU and the accession countries (AC) compared from various aspects. Counted per capita. For details, see the TERM report.**

and the Czech Republic (in the last by almost 40 per cent).

There is a notable difference between these two groups of countries. Whereas in the EU emissions continue to go down, they are levelling off in many in the accession group. The reason lies in an increase in traffic with older vehicles in the latter, annulling the gains from improvements in vehicles and fuel. The EEA foresees an increase in emissions as traffic increases in the accession countries during the next few years, followed by a marked reduction up to 2020, provided vehicles are renewed as expected. Car fleets are now on an average 4-5 years older in the accession countries than in the EU, with great variations from country to country.

As regards air quality, it is noted that urban populations all over Europe are exposed to pollution, from traffic as well as other sources, at levels posing a danger to health.

Freight carrying by road is increasing in the accession countries at the cost of the railways, just as it is in the EU. In terms of ton-kilometres, the share of the railways dropped in the accession countries from 51 per cent in 1993 to 43 per cent in 1999 – still a high figure however compared with the EU, where the railways' share in 1999 averaged only 15 per cent, ranging from 2 per

cent in Greece to 44 per cent in Austria. The sudden change in the accession countries is ascribed to new business patterns, with more small actors coming onto the scene during the nineties, and trade becoming directed more towards the EU.

While passenger traffic by rail increased slightly in the EU, it became

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*The transport trends are moving away from environmental objectives*

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just about halved in the accession countries during the nineties. At the same time air travel has increased in both groups of countries. Between 1991 and 1999 car ownership grew by almost 50 per cent in the accession group as a whole, and in some countries – Estonia, Lithuania, and Romania – by more than 100 per cent. In the EU the greatest increases were in Portugal and Greece, where they amounted to 50-60 per cent (albeit from low levels). Car ownership is highest in Italy, where there are 550 cars per 1000 of population. Flying is the mode of travel that has increased most in the EU, having grown by 60 per cent there between 1990 and 1999.

While rail networks as a whole became somewhat shortened both in the EU and the accession countries during the nineties, motorway mileage increased all the more. In the accession countries it doubled in length between 1990 and 1999, although from a relatively low figure. Taken all together, the EU countries have more than ten times the length of the accession group.

If the plan is carried out to extend the Trans-European Network (TEN) eastwards, the length of motorway in eastern Europe will jump, from the present 5000 kilometres to 20,000 in 2015. But no overall assessment of the economic, social, and environmental effects of this extension has yet been made – as none has been made either of the effects of ever more motorways in the EU, notes the EEA.

The report also contains information as to the area of land covered by roads in each country. The EU is well in the lead with an average of 1.3 per cent (4 per cent in Belgium), as against 0.9 per cent in the accession group, where Malta leads with 5 per cent.

This EEA report is the third made under the EU's transport and environment reporting mechanism, TERM. The aim is to keep track of the extent to which environmental considerations enter transportation policy, as the EU countries' heads of state decreed they should when meeting in Cardiff 1998.

Based on a set of key indicators of progress – or lack of it – the report finds that transport trends both in the EU and the accession countries are moving away from the main environmental objectives of EU policies on transport and sustainable development, instead of getting closer to them.

PER ELVINGSON

<sup>1</sup> Paving the way for EU enlargement. Indicators of transport and environment integration — TERM 2002. Environmental issue report No 32. European Environment Agency. 64 pp. 15 euro. ISBN 92-9167-517-2. Available in pdf format at [http://reports.eea.eu.int/environmental\\_issue\\_report\\_2002\\_24](http://reports.eea.eu.int/environmental_issue_report_2002_24).

<sup>2</sup> Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovenia and the Slovak Republic. For the purposes of this report, Turkey, which is also a candidate for EU membership, is also considered an accession country.



# Great changes are on the way for the taxation of road traffic

The Commission wants to harmonize the EU taxes on fuel for heavy vehicles, and to have diesel taxed at the same rate as petrol. It seems it would also like to pave the way for a kilometre tax on heavy vehicles. Even if it should not succeed in all respects, extensive changes are likely to come in the taxing of road traffic.

FOR THE LAST FIVE YEARS or so, the possibilities have been discussed within the EU Commission of forcing users to pay the social cost for wear on roads and rail tracks, and also for the exhaust emissions, carbon dioxide, noise and accidents due to traffic. In other words, to internalize the external costs. This should apply to all forms of transportation.

Five years ago the Commission published a white book entitled "Fair Payment for Infrastructure Use." This was followed by a report from a specially appointed High Level Group. The aim was to look for methods that would reflect the socio-economic costs better than taxes on petrol and diesel.

## Framework directive this year

It had been laid down, at the EU summit in Gothenburg in 2001, that the costs of all four modes of transportation should have become internalized by 2004, and the Commission is in progress of working out a communication to this end, which is likely to be of great importance for a framework directive that can be expected some time in 2003.

The framework directive will be followed by daughter directives for each mode. That for road transportation will probably replace the present road-tax directive, the Euro-vignette. It seems the intention is to pave the way for a general kilometre tax, in any case for heavy vehicles.

## Harmonized tax on diesel

Last year the Commission put forward a proposal for a directive on harmonization of the taxes on diesel for heavy trucks (COM (2002) 410 final). The tax was to be the same everywhere for trucks with a total weight of more than 16 tons, and for buses with more than nine seats, and



to start being applicable at latest by the end of 2010.

The tax on diesel now averages 343 euros per 1000 litres in the EU. It is proposed that the harmonized tax for the above types of commercial vehicle shall be fixed at 350 euros (in 2003 money value), with no allowance for any deviation.

The Commission further proposes that the tax on diesel for use in other types of vehicle should be raised from the present minimum of 245 euros to 360 per 1000 litres. The same minimum shall apply for petrol (now it is 287 euros). In practice however many countries will exact much higher taxes – which would mean there would have to be a partial rebate for heavy vehicles paying tax at the lower harmonized rate (350 euros).

## Making way for a kilometre tax

The Commission's proposal for a much lower tax for some kinds of

commercial vehicle may be regarded as simply conforming to current realities in Europe, since most of the EU member countries already impose a lower tax on diesel fuel out of consideration for business needs.

But the proposal may also be regarded as preparation for a kilometre tax. In case of a general shift to such a tax for heavy vehicles – on all types of road, not only motorways – it would be a more suitable instrument for internalizing all the costs of road traffic not directly connected with fuel consumption, such as those arising from road wear, exhaust emissions and accidents.

Under such a system it would be more logical to confine the diesel tax to the effects of the fuel on the climate. In that case it could well be less than 350 euros per 1000 litres, to reflect the marginal tax needed for achieving the Kyoto target.

The Commission's proposal would certainly give member countries an

opportunity to reduce the diesel tax for vehicles where costs had been internalized through charges for road use. But then the reduction should also apply for vehicles under 16 tons if they should be charged for a kilometre tax.

#### Same tax for petrol and diesel

The Commission had also proposed, in COM(2002) 431 final, that each country should successively raise the tax on diesel for use in other than commercial vehicles to the level of that for petrol. At present only the UK has the same tax on both. When raising the tax on diesel fuel, those countries that are now imposing a higher vehicle tax on diesel-driven cars should, in the view of the Commission, lower this tax to the level of that for a corresponding petrol-driven vehicle.

It is proposed in the same communication that where there is a sales tax on new cars it should be successively cancelled. In the view of the Commission, too, the annual vehicle tax should be differentiated according to the emissions of carbon dioxide. Again, only the UK has such an arrangement. This should also apply for the taxation of company cars.

#### Emissions trading

Two years ago, in order to try and keep down the cost of meeting the EU commitment under the Kyoto protocol for greenhouse gases, the Commission put forward a proposal (COM(2001) 581 final) for intra-European trading in emission permits, hoping in this way to bring about reductions where it would be cheapest.

In its first phase such a system would however not include emissions from road traffic; trading should be confined to emissions from energy-intensive industries, and heat and power generation.

There was no indication of what might come for road traffic. That will depend mainly on the volume of permits allotted to power companies and industries. If they should get an over-large share, a great deal will have to be done in other sectors (especially transportation and space heating) if the member countries are to meet their commitments by 2010. In those that are still far from reaching their targets – such as Denmark, Spain, the Netherlands, and Belgium

– the pressure on the transport sector could be great, leading to a considerable rise in taxes on petrol and diesel (unless these states can reach their commitments by financing reductions abroad through flexible mechanisms).

#### Often requiring unanimity

It is difficult to foresee how many of the Commission's proposals will be realized. Directives on taxation require unanimity within the Union, which has so far been difficult to

attain where taxes on energy are concerned. And it will hardly be easier when there are 25 member countries. Directives on emissions trading will, on the other hand, only need a qualified majority – as will most likely be the case for a framework directive to internalize the external costs of the various forms of transportation. But daughter directives on the tax schedules will need unanimity.

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KILOMETRE TAX

## Germany and Austria are taking the lead

Neither Germany nor Austria is waiting for any general scheme for a kilometre tax on heavy vehicles within the EU.

Germany will be starting such a tax on August 1, 2003. It will apply to trucks of more than 12 tons total weight on all the country's motorways. Vehicles in frequent use in Germany will be fitted with electronic devices for controlling movements and invoicing payments. The system relies on a computer in each vehicle (OBU, on-board unit), GPS and a "smart card" for automatic payment. The kilometre charge will be differentiated according to the number of axles and environmental classification (see table).

The Austrian kilometre tax is

scheduled to start on January 1, 2004. It will vary from 0.13 to 0.27 euro per kilometre, depending on total weight and number of axles.

Charging in Germany and Austria is having to be confined to motorways while awaiting a change in the Eurovignette directive, unlike the Swiss system which is already in place and applies on all types of road.

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#### Km charge on German motorways from August 1, 2003. Euros per km.

| No. of axles | Environmental classification |             |           |
|--------------|------------------------------|-------------|-----------|
|              | Euro 0-I                     | Euro II-III | Euro IV-V |
| 2-3          | 0.15                         | 0.13        | 0.10      |
| 4 or more    | 0.17                         | 0.15        | 0.12      |

# Not going fast enough

Reduction of the emissions of greenhouse gases will have to accelerate, if the EU is to fulfill its commitment under the protocol. It could be done, with a wide margin, if there is the political will.

FRESH REPORTS REVEAL that under present policies, both national and EU, by 2010 the Union's emissions of greenhouse gases will only have dropped by 4.7 per cent from their 1990 level, far below the 8 per cent undertaken by the EU as a body for the Kyoto protocol. But given the political will to really implement the extra measures that are now under discussion, the reduction could be 12 per cent.<sup>1,2</sup>

According to these reports, the emissions of the fifteen EU members fell, all told, by 3.5 per cent between 1990 and 2000. Although still showing a need for more effort, these last estimates give a brighter picture than that presented by the Commission in 2001, when it was thought that stabilization at the 1990 level could be the only outcome for 2010.

Most of the projected decrease of 4.7 per cent from existing measures will be the result of Germany, Sweden, and the UK cutting their emissions more than what is required of them under the scheme for burden sharing within the EU (see p.12). If they merely met their targets, the decrease in EU emissions would be no more than 0.6 per cent by 2010.

If one considers the policies and measures so far decided, the emissions of all the other twelve members will remain above their sharing targets, being projected to range from 3.4 percentage points above the target in the case of Denmark to 33.3 percentage points for Spain. The Council's decision to ratify the Kyoto protocol relies on every country complying in this respect.

Actually, however, the EU as a body and most of the member states are planning additional policies and measures. Assuming that these will all be fully implemented and have the expected effects, the total cut is projected to be 12.4 per cent.

But even under this "additional measures" scenario, at least five of

the member states – Austria, Belgium, Denmark, the Netherlands and Spain – would be exceeding their burden-sharing figures. Greece, Luxembourg, Portugal and Sweden have yet to specify how great their reductions would be.

More could be achieved by coordinating EU policies than by leaving matters to national initiatives, and the progress on proposals to this end that have already been made or are pending is summarized in the Commission's report. These range from

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*Emissions of twelve  
members will remain  
above targets*

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trading in greenhouse-gas emissions, for which a directive has just been approved by the ministers (see p.10), to fresh initiatives on more energy-efficient public procurement, a proposal for improvements in infrastructure use and charging, and a draft directive due next year for controlling the emissions of fluorinated greenhouse gases (F-gases).

Neither report gives any details about the possibilities some countries may have of using the flexible mechanisms of the Kyoto protocol to ensure reaching their targets. The reason is that few countries have yet taken up a position on the matter, and consequently there is little to go on. They might choose emissions trading, joint implementation, or the clean development mechanism. A further option would be to take into account carbon sinks – the carbon bound up in forests and soils which is acceptable, within certain limits, under the Kyoto protocol.

Although the accession countries are not included in the burden-sharing scheme, data on them now ap-

pears for the first time in the reports. All except Hungary and Poland have been assigned 8-per-cent reduction targets, Hungary and Poland getting 6 per cent. And all except Slovenia are on track to meet their targets, in most cases with a good margin. In 1999 their combined emissions lay 34 per cent under their 1990 level.

PER ELVINGSON

<sup>1</sup> **Greenhouse gas emission trends and projections in Europe.** Environmental issue report No 33. European Environment Agency, 2002. Available in pdf format at [http://reports.eea.eu.int/report\\_2002\\_1205\\_091750/en/Issue\\_33.pdf](http://reports.eea.eu.int/report_2002_1205_091750/en/Issue_33.pdf).

<sup>2</sup> **Report under Council Decision 93/389/EEC as amended by Decision 99/296/EC for a monitoring mechanism of Community greenhouse gas emissions COM(2002) 702 final.** Available in pdf format at [http://europa.eu.int/comm/environment/docum/0702\\_en.htm](http://europa.eu.int/comm/environment/docum/0702_en.htm)

## Factfile

Under the Kyoto protocol, the EU is required to reduce its overall emissions of carbon dioxide and five other greenhouse gases, to an average level that will be 8 per cent below that of 1990 levels in the years 2008 to 2012 (average for the five years).

In 2000 these emissions had decreased by 3.5 per cent compared with 1990, or slightly less than in 1999, when they had gone down by 4 per cent. Emissions of CO<sub>2</sub> were 0.5 per cent below 1990 levels, and those of methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) 16 and 20 per cent below. Emissions of greenhouse gases per capita had decreased from 11.5 tons in 1990 to 10.8 tons in 2000.



# Relaxed requirements for old plants threaten to increase emissions

THE BUSH ADMINISTRATION has announced alterations in the Clean Air Act that will considerably ease the environmental requirements when changes are made in some existing industrial activity. The move was immediately challenged in court by nine states, all in the northeastern part of the country, which suffers from the great amount of pollutants blown in from other states.

The new rules, which were posted in the federal register by EPA on December 31, 2002, concern the New Source Review Provision of the Clean Air Act, which requires that a source of air pollution, such as a power plant or an industrial complex, install the best pollution control equipment available when it builds a new facility, or makes a major modification that will increase the emissions from an existing one. The aim was to prevent plants that had existed before the advent of the law in 1977 from avoiding environmental regulation for years to come.

The changes in the Provision will mean that the owners of these plants will be able to use new ways of calculating in order to avoid making improvements. The strict definition of what constitutes a modification also becomes undermined. In the words of the nine complainant states: "Facilities could replace major plant components and extend the life of the facility by decades, and not have to install air pollution controls, as long as the changes did not enable the facility to enlarge its current capacity."

For its part the Bush administration claims that the changes will "increase energy efficiency and encourage emission reductions," and so give "a net benefit to the environment." A view that is not shared by the critics, who insist that the only winner will be industry.

Among the critics is the American Lung Association, which calls the change "a major setback" to public

health. Says John Kirkwood, president and CEO of the association: "According to the EPA, 175 million Americans live in areas violating health standards for smog or soot. Relaxing air pollution control rules applicable to 18,000 industrial pollution sources defies basic principles of common sense and good government."

Harsh criticism has also come from Carol Brown, EPA chief under the Clinton administration:

"This rollback in the law will permit thousands of the oldest, dirtiest smokestacks to continue spewing out pollution rather than installing state of the art pollution controls. It's nothing but a special deal for the special interests. It comes at the expense of all who breathe and most particularly our children."

Sources: **Environment News Service** (en-news.com), November 22, 2002 and January 2, 2003.

## Bush again criticized



The attitude of the Bush administration in environmental matters has again come under fire, this time from the Natural Resources Defense Council and the budget watchdog group OMB Watch.

A report<sup>1</sup> from the former shows that the White House has enlisted every federal agency that oversees environmental programs in a coordinated effort to relax regulations for the oil, coal, logging, mining, chemical, auto manufacturing and other industries.

One example is the changes in the Clean Air Act that will provide the nation's oldest and dirtiest power plants and refineries with loopholes exempting them from installing modern pollution controls when they upgrade or expand their facilities in ways that increase emissions. Another is the administration's contempt for water protection and conservation practices in forestry.

The OMB report<sup>2</sup> lists the Bush

administration's regulatory output of "economically significant" rules during its first two years, focusing on a number of agencies responsible for health, safety, and environmental protection.

The group notes that under the Bush administration the Environment Protection Agency has completed just two major rules – both required by court order, and both weakened at the request of affected industry – as against 23 during the first two years of Clinton's tenure and 14 by the first Bush administration during its first two years.

<sup>1</sup> **Rewriting the Rules: The Bush Administration's Assault on the Environment – 2002.** Available on NRDC's Web site at: [www.nrdc.org/legislation/rollbacks/rollbacksinx.asp](http://www.nrdc.org/legislation/rollbacks/rollbacksinx.asp)

<sup>2</sup> **Administration Advances Few Health, Safety and Environmental Protections.** Available at The OMB Watch website [www.ombwatch.org/execreport/](http://www.ombwatch.org/execreport/)



THE NIKEL SMELTER, NORWAY IN THE BACKGROUND, DECEMBER 2002. PHOTO BY RAGNAR VÅGA PEDERSEN, SVANHOVD MILJØSENTER, WWW.SVANHOVD.NO

KOLA PENINSULA

# Steps are at last being taken to curb sulphur emissions

MEASURES are finally being taken to cut down the enormous emissions of sulphur dioxide from smelters on the western side of the Kola peninsula. Russia had been offered international aid for dealing with this problem more than ten years ago, but work to that end has only just started.

Nickel ore had been found by the Finns early in the 1930s at Petsjenga (formerly Petsamo), and a smelter that is still in operation was built at Nickel in 1933. After the last World War the Russians took over the operation and greatly expanded it. There are now several opencast mines in the area, plants for metal enrichment and production of sulphuric acid – and also, worst of all from the point view of the environment, three nickel smelters.

Two of these last (named Nikel and Zapoljarny) are situated at Petsjen-

ga, near the Norwegian border. The semi-product from them is sent for final processing at Severonikel in Monchegorsk, 200 km south of Murmansk.

The emissions of sulphur dioxide from the Petsjenga plants, employing 10,000 people, were estimated to have run to 250,000-300,000 tons in 1992, but according the Norwegian environment ministry, in 1999 they had dropped to about 150,000 tons – the reduction being said to be the result of plant improvements and less use of high-sulphur ore from Norilsk.

The environmental effects have been widespread, there now being vast “sulphur deserts” from which all vegetation has vanished. Damage was first discovered on the Norwegian side of the border in the mid-seventies. It turned out that the Russians had been supplementing local

ores with others imported from Norilsk in Siberia – with a sulphur content that was ten times higher than that of the local ores. Inevitably there followed a great increase in the emissions of sulphur dioxide.

Organized cross-border work to try and save the environment got going during glasnost towards the end of the 1980s, and a Norwegian-Russian commission, which still exists, was formed in 1988. Bilateral agreements with Norway and Finland were made by the Russians under Gorbachov to reduce emissions in the border region.

Measures that might be taken at the various plants were proposed in several studies made by consultants early in the nineties, and matters went so far as to the acceptance of a bid for desulphurization and redesign of the plants. Due to the uncer-

## Recent publications

### A Breath of Fresh Air (2002)

A four-page factsheet outlining the EU air-quality legislation and ways of using it to bring about improvements. Gives ten proposals for measures to deal with pollution from road traffic.

Published by the European Environmental Bureau, European Federation for Transport and Environment, and the Swedish NGO Secretariat on Acid Rain. Available in English, French, German, Spanish, and Italian. The printed version can be had from EEB member organizations, or downloaded at [www.eeb.org](http://www.eeb.org).

### Yearbook of International Co-operation on Environment and Development 2002/2003

By the Fridtjof Nansen Institute, published by Earthscan Publications. Provides key data concerning the most important international environmental agreements, a series of articles by independent experts, and presentations of major intergovernmental organizations as well as NGOs.

334 pp. £60.00. Can be ordered from Earthscan Publications, 120, Pentonville Road, London N1 9JN, UK. Further information: [www.greenyearbook.org](http://www.greenyearbook.org).

### Bus Systems for the Future, Achieving Sustainable Transport Worldwide (2002)

Describes successful new bus systems that are revolutionizing urban travel in Latin America. It compares the new systems – which are now in place in about a dozen cities – to other, usually more expensive transit options, such as light rail and metro.

188 pp. 110 euro. Can be ordered from IEA Books, 9, rue de la Fédération 75739 Paris Cedex 15, France. E-mail: [books@iea.org](mailto:books@iea.org), Internet: [www.iea.org/books](http://www.iea.org/books).

### Round Table 119: Transport and Economic Development (2002)

It is often claimed that additions to the infrastructure will boost economic growth, but there is no scientific proof. Research appears on the contrary to show that the effect of this type of investment on employment and economic development remains limited, at least in developed countries. This report from the European Conference of Ministers of Transport gives arguments for and against the idea, together with methods for analyzing its various aspects.

199 pp. 44 euros. Obtainable from OECD TURPIN, P.O. Box 22, Blackhorse Road, Letchworth SG6 1YT, UK. Internet: [www.oecd.org/bookshop](http://www.oecd.org/bookshop).



tain political situation on the Russian side after the dissolution of the Soviet Union, no agreement was arrived at for economic aid, and the whole idea was shelved. One reason was that Norway and Finland wanted the work to be done by Norwegian and Finnish firms, which did not appeal to the Russians.

Now however the situation appears to have become so stabilized that work can commence. In December 2001 an agreement was signed between the owners of the Petsjenga combine, the Kola Mining and Metallurgical Company (subsidiary of Norilsk Nickel), the Nordic Invest-

ment Bank and the Norwegian government. Investments to the amount of 93.5 million dollars are to be made, with a third each coming from Norway, the NIB, and self-financing. Sweden will throw in a further 3 million dollars.

The money is to be paid out successively as the work proceeds. To date Norway has paid out just under 20 million kroner of its 270 million kroner undertaking. Under a special agreement, Russia has promised Norway that the project will be entirely tax-free.

It is mainly three projects that are to be carried out, in the Petsjenga area. A new briquette-making facility is to be built at Zapoljarny and a new smelter and a new plant for sulphuric acid at Nikel, with Russian technique in all cases. Norilsk Nickel will further be making extensive investments in mining, ore-crushing and concentration plant at Zapoljarny.

Taken all together, these measures are calculated to have reduced the nickel combine's emissions of sulphur dioxide, dust, and heavy metals by a good 90 per cent in 2006. Sulphur dioxide emissions should be reduced from 150,000 to 12,000 tons, or almost 140,000 tons, which, according to the latest statistics, is about as much as the combined total from Norway, Finland, and Sweden.

PER ELVINGSON

## Top ten sulphur emitters

The largest emitters of sulphur dioxide in Europe (including Turkey, Russia and Ukraine) in the mid-90s. Unit: tons SO<sub>2</sub>/yr.

1. Afsin Elbistan ..... Turkey ..... 350 000 ..... power station
2. Maritsa II ..... Bulgaria ..... 291 000 ..... power station
3. Maritsa III ..... Bulgaria ..... 220 000 ..... power station
4. Puentes As Pontes ..... Spain ..... 216 000 ..... power station
5. Belchatow ..... Poland ..... 212 000 ..... power station
6. Krivorozhskaya ..... Ukraine ..... 205 000 ..... power station
7. Lodyzhinskaya ..... Ukraine ..... 193 000 ..... power station
8. **Nikel ..... Russia ..... 189 000 ..... smelter**
9. Zuevskaya ..... Ukraine ..... 164 000 ..... power station
10. Zmiyevskaya ..... Ukraine ..... 161 000 ..... power station

Source: **The Worst and the Best. Atmospheric Emissions from Large Point Sources in Europe.** By Mark Barrett. Air Pollution and Climate Series No. 15. Published by the Swedish NGO Secretariat on Acid Rain. Available in pdf format at [www.acidrain.org/publications.htm](http://www.acidrain.org/publications.htm) or in printed version from the secretariat.

## Huge increase in Portuguese emissions

According to the EU's burden-sharing agreement under the Kyoto protocol, Portugal would be allowed to increase its emissions of greenhouse gases by 27 per cent between 1990 and 2010. Calculations made by the government's environment institute point however to an increase of 61 per cent, more even than previously suspected. Increased emissions from road traffic and the energy sector are given as the main reason for the difference.

The Portuguese government is now considering a revision of the available fiscal instruments for reducing emissions from transportation. It has also promised to take other measures (as yet unspecified) before giving final approval to a national climate change plan, scheduled for April.

*Environment Daily*. January 20, 2003.



## Second warmest

According to the World Meteorological Organization, WMO, 2002 was the second warmest year since recordings started in 1860. The warmest of all, so far, was 1998. The ten warmest years have all been since 1987, and most of them since 1990. The WMO says the figures show an accelerating trend towards worldwide warming. Since 1976 it has been three times higher than that for the last 100 years as a whole.

*Environment Daily*. December 18, 2002.



## Environmental labelling of ships

The first vessels to be granted the Blue Angel label by the Umweltbundesamt, the German environment agency, are three belonging to Södra, a Swedish forest-products company.

The environmental criteria needed to qualify for the label include reduced emissions of sulphur dioxide, nitrogen oxides (NO<sub>x</sub>) and particulates, as well as better systems for waste management. The Södra ships run on low-sulphur fuel and are equipped for SCR (selective catalytic reduction), which cuts down NO<sub>x</sub> emissions by 95 per cent.

*Environment Daily*. November 26, 2002.

## 100 have ratified Kyoto protocol

After lengthy debate, Canada finally ratified the Kyoto protocol in mid-December. This means the protocol has now been ratified by exactly 100 countries, Poland having done so just before Canada. But it all amounts to little more than a gesture. Since the US has withdrawn from the proceedings, the Kyoto protocol cannot come into force unless Russia ratifies too. Russian sources now say that it intends to do so this spring. Among the other countries that have still not ratified is Australia.

*Further information*: UN climate change convention, [www.unfccc.int](http://www.unfccc.int)



## Coming events

For the latest news and direct links, please visit [www.acidrain.org](http://www.acidrain.org) (choose "Coming events" in the lefthand column).

**EU Environment Council**. March 4.

**World Sustainable Energy Day 2003**. Wels, Austria. March 5-7, 2003. *Information*: O.Ö. Energiesparverband, Landstrasse 45, 4020 Linz, Austria. E-mail: [office@esv.or.at](mailto:office@esv.or.at). Internet: [www.esv.or.at/](http://www.esv.or.at/)

**EU Transport and Energy Council**. March 27-28, 2003.

**Air Pollution Abatement Planning in Europe**. Berlin, Germany. April 1-3, 2003. International workshop on the implementation of EU air quality directives, organized by the German Federal Environment Ministry. *Information*: [www.ecologic.de/airpollution2003](http://www.ecologic.de/airpollution2003)

**7th European Conference on Mobility Management**. Karlstad, Sweden. May 21-23, 2003. *Information*: European Platform on Mobility Management, [www.epomm.org](http://www.epomm.org).

**Fifth Ministerial Conference "Environment for Europe"**. Kiev, Ukraine. May 21-23, 2003. *Information*: Environment for Europe, 4b Inzhenerny provulok, 2nd floor, 01010 Kyiv, Ukraine. E-mail: [secretariat@kyiv-2003.in.ua](mailto:secretariat@kyiv-2003.in.ua). Internet: [www.Kyiv-2003.info](http://www.Kyiv-2003.info)

**Clean Air For Europe (CAFE) Steering Group Meeting**. Brussels, Belgium. June 2-3, 2003.

**EU Environment Council**. June 13.

**Transport and Air Pollution. 12th International Scientific Symposium**. Avignon, France. June 16-18, 2003. *Information*: Sylvie Méraud, [mereaud@inrets.fr](mailto:mereaud@inrets.fr)

**ISES Solar World Congress 2003 – Solar Energy for a Sustainable Future**. Göteborg, Sweden. June 14-19, 2003. *Information*: [www.congex.com/ises2003](http://www.congex.com/ises2003).

**7th International Conference on Energy for a Clean Environment**. Lisbon, Portugal. July 7-10, 2003. *Information*: Maria Fernanda Afonso, Instituto Superior Técnico, Mechanical Engineering Department, Av. Rovisco Pais, 1049-001 Lisbon, Portugal. E-mail: [cleanair@esoterica.pt](mailto:cleanair@esoterica.pt).

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