

# Acid News

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SHIP EMISSIONS

# Causing 64,000 deaths a year

**Smokestack emissions** from international shipping kill up to 64,000 people a year, including 27,000 in Europe, at a cost to society of more than US\$ 330 billion per year.

The number of people who died from heart and lung disease as a result of under-regulated shipping emissions totalled 64,000 in 2002, and the death toll is estimated to grow by 40 per cent, to nearly 90,000, by 2012 due to the con-

tinued rapid growth in global shipping.

“Ship pollution affects the health of communities in coastal and inland regions around the world, yet pollution from ships remains one of the least regulated parts of our global transportation system,” said Dr. James Corbett, lead author of the report. “With more than half the world’s population living in coastal regions and freight growth outpacing other sectors,

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# Acid News

A newsletter from the Swedish NGO Secretariat on Acid Rain, the primary aim of which is to provide information on air pollution and its effects on health and the environment.

Anyone interested in these matters 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 available free of charge.

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

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## The Swedish NGO Secretariat on Acid Rain

The Secretariat has a board consisting of 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:

- ✕ Keeps up observation of political trends and scientific developments.
- ✕ Acts as an information centre, primarily for European environmentalist organizations, but also for the media, authorities, and researchers.
- ✕ Produces information material.
- ✕ Supports environmentalist bodies in other countries in their work towards common ends.
- ✕ Participates in the lobbying and campaigning activities of European environmentalist organizations concerning European policy relating to air quality and climate change, as well as in meetings of the Convention on Long-range Transboundary Air Pollution and the UN Framework Convention on Climate Change.

# Editorial

**According to reports** discussed by an expert group commissioned by the International Maritime Organisation (IMO), some new figures for global fuel consumption by international shipping are about 50 per cent higher than earlier estimates.

More fuel use means higher emissions of air pollutants. A figure of 350 million tonnes (Mt) would mean global annual emissions from shipping of about 1.1 billion tonnes of carbon dioxide (CO<sub>2</sub>) and 19 Mt of sulphur dioxide (SO<sub>2</sub>).

**One of** the main arguments – usually put forward by oil industry representatives, but sometimes also by other interest groups – against mandating ships to use cleaner fuels with significantly lower sulphur content, is that the production of such fuels would increase CO<sub>2</sub> emissions from refineries.

A recent study commissioned by the American Petroleum Institute has estimated the additional CO<sub>2</sub> emissions from converting all globally used marine bunker fuel into cleaner distillate fuels with a sulphur content of 1.0 per cent by 2012 and 0.5 per cent by 2015, i.e. in line with last year's proposal by the shipping group Intertanko (see AN 4/06).

**According to the study**, such a move would cause an extra 68 Mt of CO<sub>2</sub> emissions per year from the global refining industry by 2012, increasing to 109 Mt by 2020. But switching to cleaner distillate fuels also results in less fuel consumption by ships, which reduces CO<sub>2</sub> emissions. All in all, the study calculates a global net increase in CO<sub>2</sub> emissions of 26 Mt CO<sub>2</sub> in 2012 and 44 Mt CO<sub>2</sub> in 2020, which is an approximate increase of 1.2 per cent and 1.7 per cent respectively in global CO<sub>2</sub> emissions from shipping fuels and refineries, as compared to baseline levels.

**But do we really** have to make a choice between these two evils – either damage

to the environment and our health from dirty shipping fuels, or greenhouse gas emissions from refineries?

**Probably not**, it turns out. Other submissions to the IMO's expert group include recent calculations indicating that when sulphur emissions released from ships are deposited into the oceans, they react with bicarbonate in seawater to create CO<sub>2</sub>. For each sulphur molecule (in the form of gaseous sulphur dioxide, sulphate particles or sulphuric acid) deposited in the sea, two molecules of CO<sub>2</sub> are formed.

Exactly what the balance will look like once these calculations are performed on a global basis and generally agreed upon, still remains to be seen. For example, lowering the sulphur content of 350 Mt fuels from the current average of 2.7 per cent to 0.5 per cent, would cut global SO<sub>2</sub> emissions from ships by more than 15 million tonnes.

**Ocean-going ships** burn extremely dirty fuels that contain on average almost 3,000 times the sulphur content of road diesel fuel in Europe. Regulation of polluting emissions from international shipping lags far behind land-based sources, despite widely available cleaner fuels and exhaust after-treatment technologies that are already in use by some ships.

Drastic cuts in air pollutant emissions from shipping are essential and urgent, as illustrated by a recent study on mortality associated with ship emissions, which estimates that these are responsible for some 64,000 premature deaths a year.

Moving to cleaner marine fuels is inevitable to quickly reduce emissions from new as well as existing ships and consequently to achieve necessary air quality improvements.

Christer Ågren

*Drastic cuts are essential and urgent*

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## Causing 64,000 deaths ...

*Continued from front page*

shipping emissions will need to meet stricter control targets.”

**The researchers used** the most recent global inventories of ships’ emissions of fine particulate matter (PM), sulphur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>). Through chemical reactions in the air, SO<sub>2</sub> and NO<sub>x</sub> is being converted into fine particles, sulphate and nitrate aerosols.

Tiny airborne particles are linked to premature deaths. The particles get into the lungs and are small enough to pass through tissues and enter the blood. They can then trigger inflammations which eventually cause heart and lung failures. Ship emissions may also contain carcinogenic particles.

The study notes that nearly 70 per cent of ship emissions occur within 400 kilometres of land. Using global atmospheric models, they mapped out how the pollutants spread over land. By adding demographic data, they then overlaid the location and concentration of the shipping emissions and population density. Health impact factors were used to arrive at an estimate of the total number of deaths that can be attributed to shipping emissions.

**It was found** that health impacts were concentrated in coastal regions along major trade routes. East Asia and South Asia were the most heavily impacted, each representing about one-quarter of the global impact. One-third of all shipping deaths occurred in Europe, and about one-tenth in North America.

Diesel-powered ocean-going ships burn

some of the dirtiest fuel available – on average, ship diesel fuel has 2,000–3,000 times the sulphur content of highway diesel fuel in the US and Europe. While air pollution from diesel trucks and buses on land has been reduced by over 90 per cent over the last few decades, emissions from international ships – using similar diesel engine technology – have risen virtually unchecked.

**“Right now,** we’re missing an opportunity to improve the health of millions living in port and coastal cities all over the world,” said David Marshall, senior counsel at the Boston-based Clean Air Task Force (CATF). “The regulation of polluting emissions from ocean ships lags far behind land-based sources, despite widely available, cleaner technologies already in use.”

“Our premature mortality estimates justify emission control investments on the order of many billions of dollars annually if you accept the US Environment Protection Agency’s regulatory guidelines on the value of life,” said co-lead author Dr. James Winebrake. “In addition, there are other health impacts besides mortality that are exacerbated by these pollutants, such as respiratory illnesses like asthma, pneumonia, and bronchitis.”

**The Clean Air Task Force** has estimated a first-order social cost of shipping’s premature death toll as found in the Corbett and Winebrake study. Using the cost methodology employed by US EPA to value benefits of PM emission reductions, CATF estimates that the calculated death toll from ocean-going ships currently costs more than US\$330 billion per year. With premature deaths increasing with projected freight growth, this

figure will grow to more than US\$460 billion annually by 2012. Clean-up costs pale in comparison.

Since the late 1980s, the need for air pollution standards for ocean-going ships has been on the agenda of the International Maritime Organisation (IMO), a United Nations body charged with regulating international marine environmental issues. To date, its only action on ship air emissions – the so-called MARPOL Annex VI, adopted in 1997 and in force since 2005 – has not resulted in any real improvements in global ship emissions.

**The current study** is the first to estimate global premature deaths linked to harmful emissions from ocean-going vessels. The article publication comes at a critical stage in the international negotiations on new air pollution standards for ocean-going ships (see AN 3/07, p.3).

An IMO expert group is to report in December 2007 on costs and benefits of emission-cutting strategies, and international negotiations under IMO will continue throughout the first six months of 2008.

**The study was** commissioned in part by the Clean Air Task Force and Friends of the Earth International, which are pushing the IMO to adopt new regulations to reduce shipping emissions.

They believe the IMO should require reductions in NO<sub>x</sub> emissions of around 90 per cent, and reductions in SO<sub>2</sub> emissions in the 70–90 per cent range, for both new and existing ships as soon as possible, but no later than 2015. Significant particulate matter reductions are also needed.

According to these organizations, such emission reductions can be accomplished through the use of cleaner low-sulphur fuels as well as a substantial variety of engine modifications and after-treatment devices.

Christer Ågren

**Source: Mortality from ship emissions: A global assessment.** By J. Corbett, J. Winebrake, et al. Published online in the American Chemical Society journal *Environmental Science & Technology* on 7 November 2007. The article, background information, and a press release are available at [www.catf.us/projects/international\\_air\\_quality/shipping/](http://www.catf.us/projects/international_air_quality/shipping/)

# Improve air quality by cutting ship emissions

Emissions from international shipping in European waters contribute increasingly to air pollution damage in the Netherlands – and not only in the coastal region.

**The cargo and passenger** ships plying the North Sea lanes are increasingly fouling the air above land with air pollutants that are damaging to health and the environment. A new study by the Dutch National Environmental Assessment Agency shows that pollutants emitted from international shipping reach far inland, dirtying the air not just over coastal areas but over the entire country.

It is estimated that by 2020, North Sea shipping will contribute about 21 per cent to acid deposition, 17 per cent to nitrogen oxide concentrations, and about 5 per cent to total particulate matter (PM) concentrations in the Netherlands (see Chart).

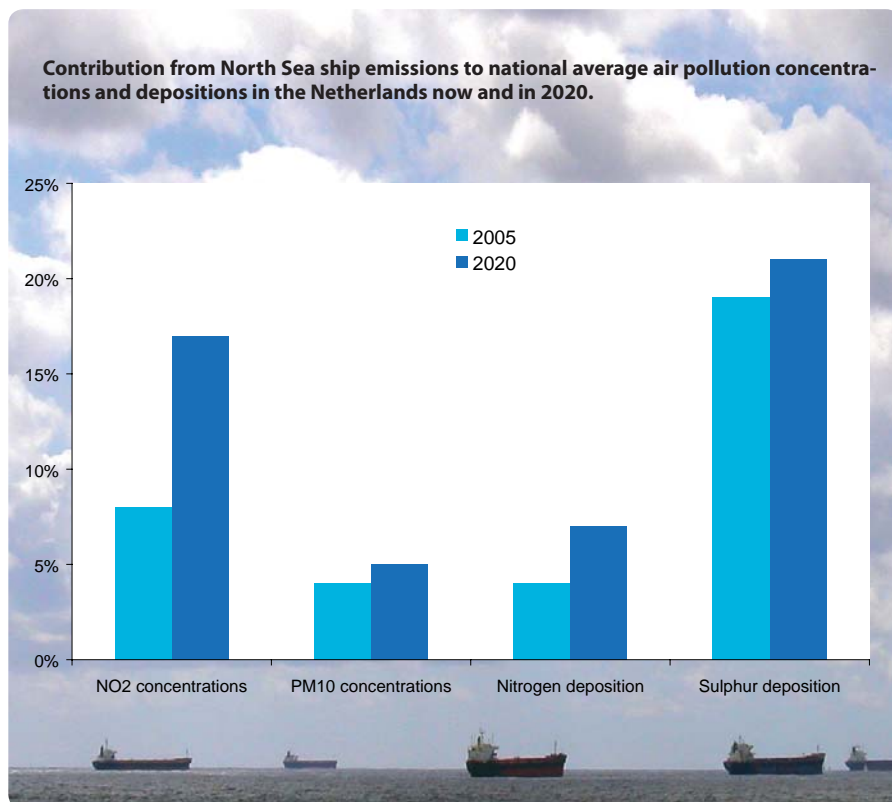
By comparison, the combined contribution to PM levels from domestic Dutch agriculture, industry, energy and refineries in the same year will be about seven per cent.

**As a result** of EU legislation and international regulation under the International Maritime Organisation (IMO), as from this autumn the sulphur content in fuel used by ships in the North Sea must not exceed 1.5 per cent.

As sea traffic grows, however, this is expected to reduce sulphur emissions by only eight per cent by 2020. Moreover, without further action, emissions of nitrogen oxides will increase by 45 per cent, and PM will go up by 35 per cent.

Cleaner fuels and engines, exhaust gas cleaning and quayside electricity points for berthed ships could significantly reduce ship emissions and related damage, the study found.

**The study compared** the impacts on Dutch air quality in 2020 from addi-



tional abatement measures on international shipping in the North Sea with those that are expected to result from implementing the ambition level of the Commission's proposed thematic strategy on air pollution. The strategy was presented in September 2005, and focuses on additional EU-wide emission reductions from land-based sources only.

**It was shown** that applying best available techniques to reduce ship emissions, would lead to substantial health and environmental improvements – for example, premature deaths from PM exposure could be reduced by eight per cent.

Shipping measures would also contribute to significant improvements in urban air quality, and thus help to achieve com-

pliance with the binding air quality standards for PM and nitrogen dioxide (NO<sub>2</sub>).

**The report concludes** that enforcing controls on shipping is a very cost-effective way to cut air pollution, and a cost-optimal strategy for air pollution abatement in Europe therefore needs to include measures for both sea and land-based sources of emissions.

Christer Ågren

*Source: Effectiveness of international emission control measures for North Sea shipping on Dutch air quality.* September 2007. By P. Hammingh, et al. Published by the Netherlands Environmental Assessment Agency. MNP Report 500092004/2007. Available at [www.mnp.nl/en/dossiers/Transboundaryairpollution/Publications](http://www.mnp.nl/en/dossiers/Transboundaryairpollution/Publications)

# Open emissions trading systems for ships criticized

It is neither desirable nor realistic to change important legislation to enable questionable emissions trading.

**Last year** a Swedish governmental committee of inquiry set up jointly by four state institutions was tasked to investigate schemes for trading shipping emissions of sulphur dioxide and nitrogen oxides (NO<sub>x</sub>), and to compare such schemes with other types of instruments.

After analyzing several possible trading schemes, the inquiry eventually agreed not to take a position on whether a system for trading in emissions rights should be introduced or how such a system should be formulated. It was agreed instead that the main focus in the short term as well as the long term should be on regulating vessels and fuels, but that economic instruments are a valuable supplementary tool for promoting the development of new technology, encouraging the use of existing technology, and hence creating opportunities for a more proactive regulation policy.

The inquiry reported that in its analysis of five different (in theory) possible open trading systems, it appeared that the majority ran counter to fundamental environmental principles, such as the Polluter Pays Principle (PPP) and the use of Best Available Techniques (BAT).

Enabling trade between shipping and land-based emission sources would also require major changes in basic environmental legislation in Sweden and the EU, including EU directives on large combustion plants (LCP) and integrated pollution prevention and control (IPPC).

**Commenting on** the inquiry report, the Swedish Society for Nature Conservation (SSNC) concluded that it is neither environmentally desirable nor politically realistic to revise four of the EU's most important pieces of air pollutant control legislation to enable questionable emissions trading systems.

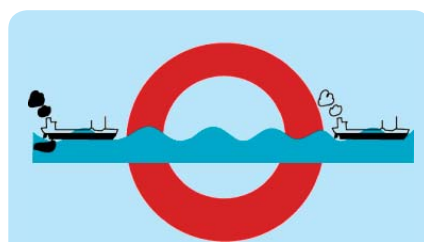
According to the inquiry, introducing

open trading systems would also jeopardise the future existence of two proven and effective Swedish economic instruments, namely the NO<sub>x</sub> charge and the sulphur tax. SSNC says it is unacceptable to sacrifice two instruments that are so important to Swedish health and the environment.

**Instead of open** trading systems, the SSNC proposes to introduce emission charges for ships. At least initially, schemes could be set up where the revenues are recycled to the shipping sector based on the environmental performance of individual ships.

Christer Ågren

**Handel med utsläppsrätter för svavel- och kväveoxider inkluderande sjöfart.** May 2007. 99 pp. In Swedish. Joint report by the Swedish Maritime Administration, the Swedish EPA, the Swedish Energy Agency, and the Swedish Institute for Transport and Communications Analysis. Available from [www.sjofartsverket.se/upload/Listade-dokument/\\_Rapporter/0602-06-02200.pdf](http://www.sjofartsverket.se/upload/Listade-dokument/_Rapporter/0602-06-02200.pdf)



## Large companies raise demands on shipping

Large Swedish import and export companies are now imposing stricter environmental demands on their shipping suppliers using a new criteria document developed by the Clean Shipping Project. One of the objectives is to propagate the criteria not only to Swedish companies but also to companies within and outside the EU.

Information: [www.cleanshippingproject.se](http://www.cleanshippingproject.se)

## Marginal ticket price increases from ferry cleanup

What would be the impacts of introducing national regulation to further reduce emissions of NO<sub>x</sub> and SO<sub>2</sub> from passenger vessels that call on Swedish ports? A study for the Swedish EPA looked at limits of 0.5 per cent fuel sulphur content and 6 grams NO<sub>x</sub>/kWh.

The additional cost would mean a rise in the price of an average ticket by 1–3.5 per cent, or approximately 1–2 euros per passenger.

Emissions of NO<sub>x</sub> were estimated to come down by nearly 10,000 tonnes (42 per cent), and those of SO<sub>2</sub> by more than 1,000 tonnes (15 per cent).

**Konsekvensanalys av emissionskrav på passagerarfartyg.** June 2007. 50 pp. Rapport 5735. In Swedish with English summary. Published by the Swedish EPA, [www.naturvardsverket.se](http://www.naturvardsverket.se)

## Innovative economic instruments could cut ship emissions

Would environmental differentiation of the Swedish state support for the maritime sector be realistic and feasible as an economic control instrument to reduce emissions of NO<sub>x</sub> from maritime shipping?

According to a study for the Swedish EPA, such a system is practically feasible to implement and could reduce emissions of NO<sub>x</sub> in the Swedish economic zone by 10–15,000 tonnes per year, corresponding to 20–30 per cent of the total yearly NO<sub>x</sub> emissions from all ships calling at Swedish ports.

The study warns however that out-flagging could become a problem, especially if such a scheme is implemented in Sweden in isolation. On the other hand, the out-flagging effect would be much smaller and the NO<sub>x</sub> emission reductions larger if similar differentiation schemes were implemented throughout the EU.

**Miljödifferiering av det svenska sjöfartsstödet.** June 2007. 111 pp. Rapport 5706. In Swedish with English summary. Published by the Swedish EPA, [www.naturvardsverket.se](http://www.naturvardsverket.se)



GREENHOUSE GASES

# Massive emission reductions needed

To limit global warming to 2°C above pre-industrial levels, emissions from the industrialized countries would need to be reduced around 80 per cent or more by 2050 to provide emissions space for developing countries.

**How much must** global emissions be reduced to limit global warming to 2°C above pre-industrial levels? A 50-per-cent reduction by 2050 is probably not enough, according to modelling work carried out at the Potsdam Institute for Climate Impact Research.

Emission pathways for limiting warming to 2°C or less, need to meet several objectives simultaneously:

- ▶ Sufficient probability or confidence that warming can be limited to the required level. A lower probability pathway allows higher emissions, but there is a lower confidence of meeting the target.
- ▶ Technical and economic feasibility

of the pathway. IPCC's Working Group III established in their Fourth Assessment Report (2007) the technical and economic feasibility of pathways down to an 85-per-cent reduction from 2000 levels in 2050.

▶ The regional allocation of emissions provides sufficient emissions for developing countries. If emissions are not reduced rapidly enough by the present Annex I countries there will not be adequate emissions allowances for developing countries in the future.

**The IPCC Fourth** Assessment Report provides some limited guidance on

emission pathways consistent with limiting warming to 2°C.

For concentration stabilization scenarios, which limit greenhouse gas (GHG) levels in the range 445–490 ppm of CO<sub>2</sub> equivalent (CO<sub>2</sub>-eq), global emissions are found to peak before 2015 and to fall by 50 to 85 per cent from 2000 levels by 2050 (this could also be expressed as a 45–83 percent fall from 1990 levels).

IPCC's Working Group I has estimated the climate sensitivity at 2.0–4.5°C, but cannot exclude higher values. Using their "best estimate" of 3°C the resulting warming (at equilibrium) would

be in the range 2.0–2.4°C. The emission pathway followed between 2015 and 2050 and the absolute extent of the emission reductions achieved by that year would influence the probability of limiting warming to 2°C or below.

These results were picked up the Third Meeting of the Ad Hoc Working Group On Further Commitments For Annex I Parties Under The Kyoto Protocol (AWG).

The AWG decided, in consideration of the “level of ambition of further emission reductions by Annex I Parties” (all G8 members including the USA are Annex I member of the UN climate convention) that global emissions “have to be reduced to very low levels, well below half of levels in 2000 by the middle of the twenty-first century, in order to stabilize their concentrations in the atmosphere at the lowest levels assessed by the IPCC to date in its scenarios.”

**The table below** shows global and Annex I emission pathways that have about a 50-per-cent chance of limiting warming to 2°C above the pre-industrial level, together with those pathways that are likely to do so.

One of the reductions aims being discussed globally is a reduction of 50 per cent by 2050, with the base year unclear. A 50-per-cent global reduction from 1990 is not likely to limit warming to 2°C: roughly speaking emissions at this level would make it as likely as not that warming would exceed 2°C.

**Emission pathways for limiting global warming to 2°C above the pre-industrial level.**

|                      | 50% chance   | Likely  |
|----------------------|--|---|
| Global               | Peak before 2020<br><br>Reduce from this peak to about 15% above 1990 levels in 2020<br><br>Be about 50% below 1990 emission levels in 2050. | Peak before 2020<br><br>Reduce from this peak to about 10% above 1990 levels in 2020<br><br>Be lower than 50% below 1990 emission levels in 2050. |
| Annex I <sup>1</sup> | Peak before 2020<br><br>Reduce from this peak to 15% below 1990 levels in 2020<br><br>Be about 70% below 1990 levels in 2050.                | Peak before 2020<br><br>Reduce from this peak to 30% below 1990 levels in 2020<br><br>Be more than 80% below 1990 levels in 2050.                 |

<sup>1</sup> The Annex I emission pathway is determined by the assumptions as to plausible and fair emission allocation systems, that provide for emissions space from developing countries.

**A 50-per-cent reduction** from 2000 or 2007 equates approximately to 45 and 40-per-cent reductions from 1990 levels, respectively. Such reductions would make it even less likely that warming could be limited to 2°C.

The EU has proposed that emissions by developed countries be reduced to “60 to 80 per cent by 2050”. With global emissions needing to fall more than 50 per cent below 1990 levels by 2050 to limit likely warming to 2°C, the reductions by the Annex I countries would need to be around 80 per cent or more to provide emissions space for developing countries.

Canada has proposed 60–70-per-cent reductions compared to 2006, which has been estimated as about 50–60 per cent below 1990 levels. If this were applied to all Annex I countries it would be substantially weaker than the EU proposal for 2050 and would not provide for developing country emissions within a global emissions path likely to keep warming below 2°C.

**These pathways** are computed with a range of carbon cycle model assumptions that however at present do not include an estimate of the effects of more positive carbon cycle feedbacks identified in the IPCC Fourth Assessment Report. Inclusion of such effects would increase the level of emission reductions needed in each time period.

Bill Hare

Bill Hare is a Visiting Scientist at the Potsdam Institute for Climate Impact Research and is supported in this role by Greenpeace International.

*Further reading:* Meinshausen, M., B. Hare, et al. (2006). **Multi-gas Emissions Pathways to Meet Climate Targets.** Climatic Change: 1-44.

**Transport Action Europe - make your voice heard!**

Friends of the Earth England, Wales and Northern Ireland, with the help of environmental groups across Europe, has launched a new web site (in several languages) that gives members of the public across Europe the opportunity to lobby their MEPs on the key transport/climate votes.

*Web link:* [www.transportactioneurope.org](http://www.transportactioneurope.org)



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# Shipping could be a part of ETS

**Emissions of carbon dioxide** from international shipping could be capped by linking them to the European Emission Trading Scheme (ETS), which today only includes large land-based point sources, according to a new study.

The idea is to tie the permission for a ship to call at a port of a participating country to the vessel’s participation in a scheme for emissions trading under a common cap. The ship would be liable for emissions from fuel bunkered during, say, a six-month period prior to a call at a participating port.

With this approach, emissions from the return voyages of ships involved in intercontinental traffic would automatically be covered, and shipowners and operators would gain nothing by calling at ports just outside the EU.

The report discusses various ways for initial allocation of allowances and concludes that the best method would be to sell them by auction and return the revenues to the shipping sector.

If the cap-and-trade system is initially limited to EU ports, at least 6,200 million tonnes less of CO<sub>2</sub> would be emitted over the 23-year period between 2012 and 2035 compared to a business-as-usual scenario. However, a large part of this would be due to reductions in land-based sources paid indirectly by the shipping sector.

*Source:* **Linking CO<sub>2</sub> Emissions from International Shipping to the EU ETS.** By Per Kågeson. Commissioned by the German Environment Protection Agency, July 2007.

# “The time for doubt has passed”

In the run-up to the Climate Conference in December the Intergovernmental Panel on Climate Change (IPCC) has issued its clearest message to date to decision-makers around the world.

“**Today**, the time for doubt has passed. The IPCC has unequivocally affirmed the warming of our climate system, and linked it directly to human activity.”

The words were spoken by UN Secretary-General Ban Ki-moon in November at the 27th session of the IPCC, when it adopted a synthesis report summing up the three sub-reports the climate panel had presented during the year (see AN 1/07 and 2/07).

The summary of the synthesis report for policymakers runs to just 23 pages, but restates the most important conclusions of the sub-reports.

▶ Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.

▶ Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases.

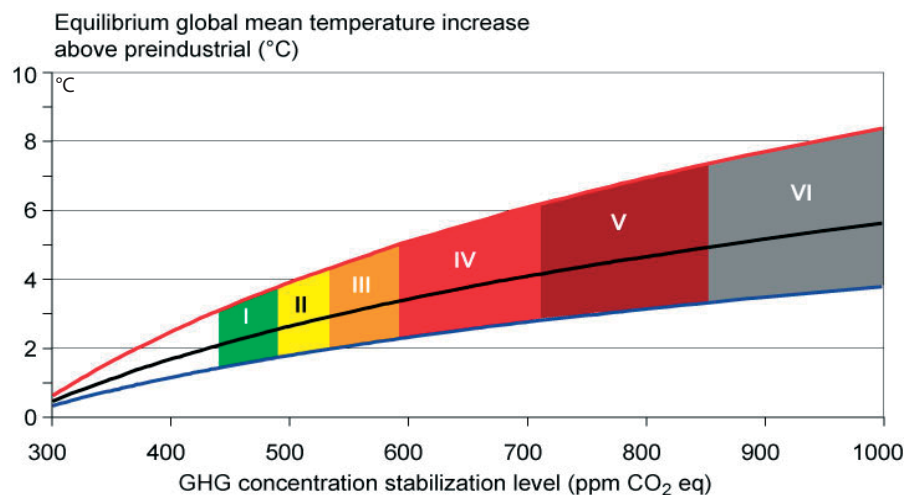
▶ Global atmospheric concentrations of greenhouse gases have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years.

▶ Temperatures are likely to rise by between 1.1 and 6.4°C and sea levels by between 18 and 59 centimetres this century.

▶ Warming and sea level rise would continue for centuries due to the time-scales associated with climate processes and feedbacks, even if concentrations of greenhouse gases were to be stabilised.

▶ Africa, the Arctic, small islands and Asian mega-deltas are likely to be especially affected by climate change.

▶ About 20–30 per cent of species will be at increasing risk of extinction if fu-



**The more greenhouse gases, the warmer it gets.** To limit warming to 2°C above the pre-industrial level the concentration must stabilize around 400 ppm CO<sub>2</sub>-eq. The level today is around 450 ppm CO<sub>2</sub>-eq, so large emission cuts are needed. *Figure: IPCC Fourth Assessment Report.*

ture temperature rises exceed 1.5–2.5°C.

▶ The warming could lead to some impacts that are abrupt or irreversible.

**The IPCC states however** that there are good opportunities to turn the trend and that many policy instruments are available. A strong focus must be placed on energy efficiency. An effective carbon-price signal could realise significant mitigation potential in all sectors.

The costs will not be insurmountable either, assuming that measures are put in place quickly – the longer we wait the more drastic the measures needed to achieve a given target. Analyses show that the costs by 2050 for the toughest scenario examined – stabilization at 445ppm CO<sub>2</sub> equivalents, would slow average annual global GDP growth by less than 0.12 percentage points.

**The IPCC does not recommend** any single scenario, simply pointing out what their consequences would be. For the lowest mitigation scenario category assessed (and the only one that comes

close to limiting warming to a maximum of two degrees), emissions would need to peak by 2015 and decline thereafter (see also article on pp. 6-7).

The IPCC report will provide an important foundation when the world's leaders meet on Bali in December to start negotiations on the successor to the Kyoto Protocol. Ban Ki-moon, UN secretary general, wants to see a forceful response:

“Today the world's scientists have spoken clearly and with one voice,” he said. “In Bali I expect the world's policymakers to do the same.”

Per Elvingson

Further information: IPCC, [www.ipcc.ch](http://www.ipcc.ch)

**The Intergovernmental Panel on Climate Change (IPCC)** was set up in 1988 by the UN Environment Programme and the World Meteorological Organization to give governments scientific advice about climate change.

Its fourth assessment report, totalling more than 3,000 pages, draws on work by some 2,500 climate scientists from more than 130 nations.



# Commission takes action on air quality

The European Commission has started infringement procedures against France, Italy, Spain, Slovenia and the UK for exceeding EU limits on ambient concentrations of sulphur dioxide.

The daily limit value was most commonly exceeded in Slovenia, while France, Italy and Spain also reported hourly concentrations above 1000 µg/m<sup>3</sup> – almost three times above the EU limit. These member states reported exceedances in several places, while the UK declared a single exceedance.

EU limit values for sulphur dioxide, PM10 and several other pollutants were agreed in a 1999 directive.

As discussions on a new air-quality directive are ongoing within the Council and European Parliament, the Commission believes it would be inappropriate to take infringement action over PM10 exceedances at this time.

It has therefore sent requests for information to the 23 member states that have reported exceedances of the PM10 values for 2005. The letters require member states to provide information on the measures they are taking to eliminate or reduce exceedances.

Some 70 per cent of European towns and cities with 250,000 inhabitants or more have reported exceeding the PM10 limits in at least part of their area.

Letters have not been sent to Ireland, which reported no exceedances; Luxembourg, which has failed to provide any report (an infringement case has been opened over this); and Bulgaria and Romania, which are required to report only from 2007 onwards.

Source: European Commission, press release 17 October 2007.

# High concentrations despite drop in emissions

Concentrations of ozone and particulate matter (PM) have not improved since 1997 despite substantial cuts in emissions of air pollutants from land-based emission sources across Europe, says a report from EEA, the European Environment Agency.

High levels of PM and ozone in the air, as observed in 2003, can partly be explained by weather conditions. Other causes could include additional pollution coming from natural sources and pollution transported from countries outside Europe, the report says.

Key points of the report:

► Estimates indicate that up to 43 per cent of the European urban population was exposed to PM10 concentrations in excess of the EU air quality limit value between 1990 and 2004. The worst-af-

ected areas were Belgium, the Netherlands, Luxembourg, Poland, the Czech Republic and Hungary, as well as the Po Valley in Italy and southern Spain.

► Up to 60 per cent of the European urban population was exposed to ozone concentrations in excess of the EU air quality limit values between 1990 and 2004. Exposure of crops and forests to ozone exceeded limit/critical values over very large areas of central and southern Europe.

► Human exposure to certain other potentially harmful air pollutants, sulphur dioxide (SO<sub>2</sub>), carbon monoxide (CO) and lead, has decreased markedly due to effective air quality policies.

Further reading: **Air pollution in Europe 1990–2004**. EEA report No 2/2007. Available at [www.eea.europa.eu](http://www.eea.europa.eu)

## EP gives air polluters breathing space

The European Parliament's Environment Committee on 9 October adopted a report on air quality which, if approved, would postpone the existing deadlines by which member states must meet the current air quality standards that are intended to protect our health.

The European Environmental Bureau, EEB, has expressed its concern at Parliament's latest move. "We're dismayed that some members of parliament want to give air polluters five more years (until 2013) to clean up their act," said Dragomira Raeva, EEB's Air Policy Officer. "Environment ministers have previously said they only need three more years to achieve the approved pollution cuts. The Environment Committee's decision sends the wrong signal to national authorities, which need urgently to improve air quality in our cities."

The Parliament has also endorsed changes that would in practice allow a wide range of places to be exempted from applying air quality standards.

Negotiations for a so-called "second reading agreement" are ongoing between the Parliament, Council and Commission. Should these fail, a Parliament plenary vote is scheduled for 12 December.

## Ozone set to harm crops and the world economy

Without curbs on emissions, growing fuel combustion worldwide will push global average ozone up 50 per cent by 2100, say scientists from Massachusetts Institute of Technology in a research report published in November's *Energy Policy* journal.

Due to the calculated increase in emissions, forest and pasture yields will decline slightly, or in some cases grow, because of the warmer climate and carbon dioxide effects, but crop yields would fall by nearly 40 per cent worldwide, the study said.

This does not translate directly into economic losses. The world would adapt by expanding the amount of land for crops. But the cost of doing so would reduce 10–12 per cent of the total value of crop production.

The damage varies by region. The United States, China and Europe would need to import more food, while supplying those imports would benefit tropical countries.

Source: **Planet Ark**, 31 October 2007. Further reading: **Energy Policy**, Volume 35, Issue 11 (November 2007): Global economic effects of changes in crops, pasture, and forests due to changing climate, carbon dioxide, and ozone. Pp. 5370–5383.

# Cooperation needed for a healthy environment

Resource use efficiency is up to 20 times higher in the old EU15 than in the rest of Europe.

**Environmental policy** across the pan-European region is hampered by gaps in information and implementation, according to a report by the European Environment Agency (EEA).

The report was presented at the sixth ministerial conference of the "Environment for Europe" process, held in Belgrade, Serbia, under the auspices of the UN Economic Commission for Europe (UNECE).

Improved implementation of existing policies and the setting of clear, realistic targets is a key recommendation of the report. Several key environmental conventions have still not been fully implemented across the region since a meeting in Kiev four years ago. A shared environmental information system is also urgently required to deal with a prevailing lack of reliable, accessible and comparable environmental information across the region.

The report points out that greenhouse gas emissions are rising fast, particularly in south-eastern Europe and central Asia.

**Despite some success** with air pollution, current levels are estimated to reduce life expectancy by as much as two years in the most affected areas of Belgium, the Netherlands, northern Italy and parts of Poland and Hungary, and to threaten the healthy development of children.

The estimated annual loss of life is significantly greater than that due to car accidents, according to the report.

In Eastern Europe, Caucasus and Central Asia, the situation is assumed to be similarly bleak: here most air polluting emissions have increased by 10 per cent since 2000 as a result of economic recovery, growth in transport and the poor effectiveness of pollution policies.



Most environmental pressures in the region come from agriculture, tourism, transport and energy production. Data collected by EEA shows a sharp contrast between EU member states and other countries in the region. For example, resource use efficiency is up to 20 times higher in the old EU15 than in the rest of Europe.

**"To respond to** these complex environmental issues, we need continued co-operation across the pan-European region as well as targeted financial and technical support," said Professor Jacqueline McGlade, Executive Director of the EEA.

Per Elvingson

**The report: Europe's environment – the fourth assessment**, is the latest in a series of assessments of the pan-European environment published by the EEA over the past 15 years. It assesses environmental progress in 53 countries, an area with a total population of more than 870 million people. The region includes: Eastern Europe, Caucasus and Central Asia, South East Europe, as well as Western and Central Europe. View the full report here: [www.eea.europa.eu/pan-european/fourth-assessment](http://www.eea.europa.eu/pan-european/fourth-assessment)

**The process:** The 6th "Environment for Europe" Ministerial Conference took place in Belgrade on 10–12 October 2007. It brought together some 2000 participants, including ministers and high-level delegates from 56 countries. The Conference reviewed progress in implementing agreed commitments since the previous Ministerial Conference in Kiev 2003. Further information, links to publications etc: [www.unece.org/env/efe](http://www.unece.org/env/efe).

# Car use fuels climate change – and obesity

The “twin crises” of global warming and obesity could be tackled effectively if walking was recognised more as a means of transport.

That is the message from a report by the Institute for European Environmental Policy (IEEP). It says if all drivers were to replace 6 kilometres per week of car journeys by walking – totalling about an hour a week – it would save more than 15 per cent of the total emissions from passenger cars.

The report is based on British figures, but the authors say the message is valid throughout Europe.

They argue that renewed efforts to promote walking as transport would be vastly cheaper than dealing with the consequences of widespread obesity and climate change.

Carolina Valsecchi of the IEEP said: “The twin crises of obesity and climate change are clearly interlinked through the switch from muscle power to engine power for transport. Concerted action is needed to reverse this trend.”

Source: **T&E Bulletin**. October 2007. Further reading: **Unfit for Purpose: How Car Use Fuels Climate Change and Obesity**. Available at [www.ieep.eu](http://www.ieep.eu) (Publications).

# Subsidiarity limits EU action on urban mobility

The Commission has unveiled a consultation paper on urban mobility, despite its influence being severely limited by the subsidiarity principle. Most urban transport issues are resolved at national and local level, but the Commission believes the scale of the problems faced by urban areas means that EU has a role to play.

The green paper provides a number of general aims, but the centrepiece of EU involvement is likely to be new rules on public procurement of clean public transport vehicles, one of the only areas in which Europe has direct influence. Transport Commissioner Jacques Barrot has promised revised proposals in this area by the end of this year.

Two years ago the Commission published draft legislation that would have forced public authorities to ensure at least 25 per cent of their new vehicles met an EU “enhanced environmentally friendly standard”, but the plans were heavily criticized for being too weak to make any difference, and they have not been taken further.

A public consultation on the green paper will run until 15 March 2008, with the results feeding into an EU action plan on urban mobility, which the Commission will adopt next autumn.

Source: **T&E Bulletin**. October 2007. Further reading: EU Commission, [http://ec.europa.eu/transport/clean/green\\_paper\\_urban\\_transport/index\\_en.htm](http://ec.europa.eu/transport/clean/green_paper_urban_transport/index_en.htm).

## Congestion charging introduced in Milan

City authorities in Milan have approved a city centre charge to start this autumn aimed at reducing congestion and tackling air pollution. The system will be in operation from 07.00 to 19.00 via a system of electronic monitoring devices at 42 entry points to the city centre, and the charge will range from 2 to 10 euro depending on the emissions of the car. Milan is one of Italy’s worst cities for air pollution.

Source: **T&E Bulletin** September 2007.

## Substantial drop in EU road fuel sulphur levels

All EU member states except Poland and Malta complied with the requirement of the 1998 EU fuel quality directive to phase out petrol and diesel with more than 50 parts per million (ppm) of sulphur by 2005.

The information comes in a report on compliance with the directive. No fuel with more than 10 ppm can be sold after 2009, and eight states have already achieved this, among them Denmark, Finland, Germany and Sweden.

Source: **T&E Bulletin**, November 2007.

## Support for de-carbonization of fuels

In January the European Commission proposed, as part of a revision of the EU fuel quality directive approved in 1998, to introduce mandatory reporting and monitoring of “life-cycle greenhouse gas emissions” from transport fuels (see AN 3/07, p.21).

At their meeting in October, EU environment ministers approved the principle, although they identified three major concerns over the plan that could yet be serious stumbling blocks:

- ▶ The need for clear and harmonized methods to calculate life-cycle emissions.
- ▶ The need to clarify the relationship of the fuel proposal to other legislation, in particular the proposed target for biofuels.
- ▶ The need to have sustainability criteria in biofuels production.

The European Parliament will vote on the draft legislation in January.

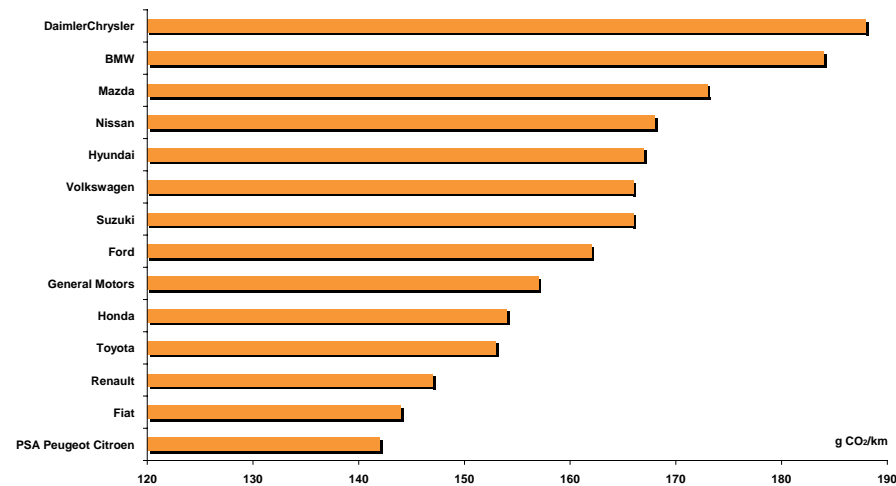
Source: **T&E Bulletin**, November 2007.

## Cap now fixed for the second trading period

The cap for the 2008–2012 trading period of the EU Emissions Trading Scheme (EU ETS) for carbon dioxide has now been fixed at 2.08 billion allowances per year, a reduction of 10 per cent in the number of allowances wanted by governments.

The Commission only accepted proposed emissions quotas for the next phase of the scheme for the United Kingdom, France, Slovenia and Denmark. Some countries, including the three Baltic states, were given only half their requested quotas.

Source: **European Commission**, press release 26 October 2007.



Fleet average emissions in 2006 (grams CO<sub>2</sub>/km). The graph starts at 120 g/km.

## Increasing climate divide between carmakers

**French, Italian and Japanese** carmakers extended their lead over German rivals last year in the race to deliver fuel-efficient, low emission vehicles, according to new figures published by the European Federation for Transport and Environment (T&E).

Of the major car-producing countries in Europe, Germany actually increased emissions of carbon dioxide (CO<sub>2</sub>) from new cars sold by an average of 0.6 per cent in 2006. By contrast, French and Italian manufacturers cut emissions by an average of 1.6 per cent.

Despite the overall increase in emissions from German producers, a split has emerged within the country's car industry. BMW AG reduced average emissions by 2.5 per cent but this improvement was more than offset by the two largest German groups, DaimlerChrysler (now called Daimler) and Volkswa-

gen AG, which showed increases of 2.8 and 0.9 per cent respectively.

**Japanese carmakers** made significant progress in 2006, achieving cuts of 2.8 per cent on average. According to the EU data, Toyota made the biggest improvement of any major car manufacturing group in 2006 with the average vehicle sold in 2006 emitting five per cent less CO<sub>2</sub> than in the previous year.

Only manufacturers that sold over 200,000 vehicles in Europe in 2006 were included in the study. The figures, based on sales in Europe in 2006, are derived from official EU monitoring data obtained by T&E under laws granting access to official documents.

*Further reading: **Reducing CO<sub>2</sub> Emissions from New Cars: A Study of Major Car Manufacturers' Progress in 2006.** Can be found at [www.transportenvironment.org](http://www.transportenvironment.org).*

## Parliament U-turn on cars and climate

**In a non-binding** vote on 24 October, the European Parliament said the average new car should emit no more than 125 grams of CO<sub>2</sub> per km by 2015.

In terms of emission reductions per year, this target is 40 per cent weaker than the existing EU target of 120 g/km by 2012 and 20 per cent weaker than the Commission proposal of 130 g/km by 2012 announced in February, according to T&E, the European Federation for Transport and Environment.

The move represents a U-turn by MEPs as Parliament has repeatedly pledged its support for the long-standing 120 g/km target by 2012. The latest pledge came in a resolution on climate change on 14 February that called for this target to be made legally binding.

The Commission is expected to draft formal legislation in the new year.

*Further information: **T&E**, [www.transportenvironment.org](http://www.transportenvironment.org).*

## Make manufacturers responsible for targets

What is the best legal framework for implementing the Commission's proposal to set a limit of 130 g/km on average CO<sub>2</sub> emissions from new passenger cars? Two different options have been analyzed in a new report:

- ▶ A directive establishing a legal framework and responsibility for member states to achieve the target level; and
- ▶ European regulation of the motor industry to enforce the target level.

The best option, according to the report, is a regulation that would allocate responsibility for achieving the target to car manufacturers at the European level and give manufacturers maximum flexibility by allowing them to balance emission credits between all their brands.

*Further reading: **A European Regulation on the Fuel Efficiency of New Cars.** By Per Kågeson, Nature Associates. Commissioned by the Low Carbon Vehicle Partnership, UK ([www.lowcvp.org.uk](http://www.lowcvp.org.uk)).*

### Coming events

*For the latest news and direct links, please visit [www.acidrain.org](http://www.acidrain.org)*

**UN Climate Convention COP13 and COP/MOP3.** Bali, Indonesia, 3-14 December 2007. *Information:* [www.unfccc.int](http://www.unfccc.int).

**Executive Body for the LRTAP Convention.** Geneva, Switzerland, 10-13 December. *Information:* LRTAP Convention, [www.unece.org/env/lrtap](http://www.unece.org/env/lrtap)

**EU Environment Council.** 17 December 2007.

**Central European Biomass Conference 2008.** Graz, Austria, 16-19 January 2008. *Information:* [www.biomasseverband.at](http://www.biomasseverband.at).

**3rd International Solar Cities Congress.** Adelaide, Australia, 17-21 February 2008. *Information:* International Solar Cities Initiative, [www.solarcitiescongress.com.au](http://www.solarcitiescongress.com.au)

**World Sustainable Energy Days 2008.** Wels, Austria, 5-7 March 2008. *Information:* [www.wsed.at](http://www.wsed.at).