

Acid News

NO. 1, MARCH 2009

Enforcement is the key

Considering the damage to health and the environment caused by air pollution, compliance with air quality directives is essential. Strict enforcement action by the Commission must be a priority.

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Strong – and weak

The EU climate package – finally approved last December – is a strong policy framework. The problems are in the numbers.

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One per cent will do

Global warming can be kept below the critical 2°C rise at a cost of well below one per cent of global GDP.

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Ecosystems under threat

Excess nitrogen deposition in the EU is threatening the sustainability of natural ecosystems over an area of more than one million square kilometres.

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The top-ten list of European polluters

The top ten large coal-fired combustion plants are responsible for 30 per cent of EU's total sulphur emissions.

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The other CO₂ problem

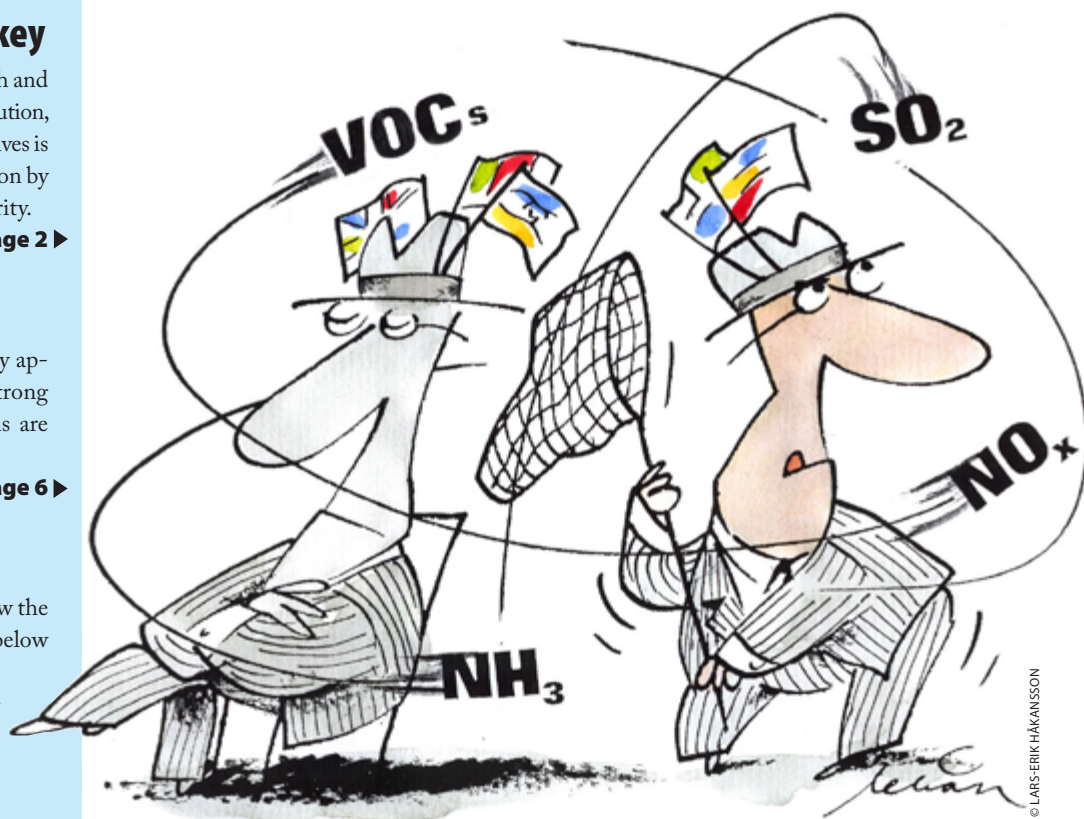
Within decades increasing atmospheric carbon dioxide levels in the atmosphere could severely damage marine ecosystems, scientists warn.

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Stricter standards

Stricter EU standards for emissions from heavy vehicles will apply as from 2012.

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16 states exceed emission limits

Only eleven member states expect to comply with their emission limits for all four air pollutants set by the EU national emission ceilings directive.

Sixteen EU countries are likely to exceed national limits on emissions of at least one of four key air pollutants set for 2010, according to an analysis carried out by the European Environment Agency (EEA).

The national emission ceilings directive (NEC) sets pollutant-specific and legally binding emission ceilings for each member state to meet by 2010. It requires the countries to submit annual reports on emissions and projections for four air pollutants: sulphur dioxide (SO₂), nitrogen oxides (NOx), volatile organic compounds (VOCs) and ammonia (NH₃).

EEA's analysis is based on figures reported by member states, including final data for 2005, preliminary data for 2006 and projected emissions in 2010.

Only eleven member states anticipate they will meet all four emission ceilings, while fifteen states indicate they will miss at least one of their respective ceilings. One member state – Luxembourg – did not provide any emission projections.

Nitrogen oxides continue to pose the greatest challenge, with thirteen member states predicting they will miss their na-

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Acid News

A newsletter from the Air Pollution & Climate Secretariat, 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 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.

Language consultant: Malcolm Berry,
Seven G Translations, UK.

Printed by Trio Tryck AB, Örebro, Sweden.
ISSN 0281-5087.

The Air Pollution and Climate Secretariat

The Secretariat has a board consisting of one representative from each of the following organizations: Friends of the Earth Sweden, Nature and Youth Sweden, the Swedish Anglers' Association, the Swedish Society for Nature 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



On 29 January the European Commission issued a series of legal threats to Member States for alleged breaches of EU legislation on air quality and industrial pollution.

Eight countries – Belgium, Bulgaria, Greece, Italy, the Netherlands, Portugal, Slovenia and Spain – were given a second and final warning, the last legal step before being taken to the European Court of Justice, over their failure to issue permits to industrial installations under the 1996 integrated pollution prevention and control (IPPC) directive. First written warnings were given to Denmark and Ireland for the same reason.

At the same time, first warnings were sent to ten states – Cyprus, Estonia, Germany, Italy, Poland, Portugal, Slovenia, Spain, Sweden and the UK – for failing to comply with air quality standards for health-damaging particulate matter (PM₁₀) in force since 1 January 2005. They had so far not submitted requests for time extensions for meeting the limits, although some were in the process of doing so.

While the air quality directive contains some degree of flexibility and allows time extensions if certain conditions are met, these derogations must not delay measures to reduce emissions. And in areas where time extensions are not applicable the standards must be fully respected.

As described in articles in this issue of Acid News, many Member States also appear to have great difficulty complying with other air quality related legislation.

In 2006 almost 30 per cent of the large combustion plants in the EU – according to Member States' own reports – operated above the binding emission limit values for SO₂ and NO_x set by the large combustion plants (LCP) directive.

According to an analysis carried out by the European Environment Agency,

sixteen Member States are likely to exceed their national limits on emissions of at least one of four key air pollutants set for 2010 in the national emissions ceilings (NEC) directive.

Since the NECs are set for 2010, a final judgement on whether or not countries have eventually complied with their ceilings or not, cannot be made until about two years later, when all the necessary emission data is final.

This is however a clear warning signal that several countries that expect to exceed their NECs have not reported on plans to implement additional measures that may allow them to comply with their ceilings. According to the directive, any country that is not on track should already have developed and presented such plans by 2006.

The fact that the air quality directive was recently revised, that the IPPC and LCP directives are currently under revision, and that the NEC directive is scheduled for revision does not relieve Member States of the existing legal obligations of those directives.

In contrast to most international environmental treaties, the EU does actually have the tools needed for strict enforcement. Financial penalties can be imposed either as a periodic (e.g. daily) penalty payment that aims to put an end as soon as possible to a breach of obligations, or as a lump sum, in particular where the breach has persisted for a long period, or both types of penalties can be combined and imposed simultaneously.

Considering the serious and widespread damage to health and the environment caused by excessive air pollution, compliance with all these directives is essential, and strict enforcement action by the Commission must be a top priority.

Christer Ågren

**To
comply
or not to
comply**

Petrol vapour recovery to become mandatory

Draft new EU legislation that would limit harmful vapour emissions from petrol pumps was proposed on 4 December by the European Commission.

Petrol vapour contains

benzene, which is known to cause cancer, and contributes to the formation of ground-level ozone, one of the air pollutants that is most damaging to human health and the environment and which also contributes to global climate change.

Under the proposal, petrol pumps will have to be fitted with stage II petrol vapour recovery (PVR) technology, which can recover more than 85 per cent of the vapour.

New or substantially refurbished petrol stations that sell more than 500 cubic metres of petrol a year would have to fit the technology as from 1 July 2012. So would all new service stations underneath residential accommodation, irrespective of their size.

The largest existing stations, with a throughput greater than 3,000 cubic metres would also have to install stage II PVR by 31 December 2020 at the latest.

This is petrol vapour recovery

Inside a car's petrol tank, petrol vapour exists above the liquid petrol. When the car is refuelled this vapour is displaced and escapes to the atmosphere. Stage II PVR captures this escaping vapour. This is done by creating a vacuum to suck back the vapour through the dispensing hose and nozzle, either to the station's underground storage tank or directly back to the fuel pump. This latter technology is newer and does not require any modification of the underground pipe work at the petrol station.



- PVR stage II now, or else....

There are some 110,000 service stations in the EU. It is estimated that in many Member States over 85–90 per cent of the stations have an annual throughput of petrol greater than 500 cubic metres, whilst the average across the EU is about 75 per cent.

Already more than half of the EU Member States have national stage II PVR measures in place, and in some countries the technology has been mandatory since the 1990s. Moreover, in several countries – such as Austria, Czech Republic, Italy, Latvia, Luxembourg and Slovenia – the PVR emission controls apply to all stations, independent of size.

Member States that have not yet introduced legislation to implement these measures include: Cyprus, Estonia, Finland, Greece, Ireland, Malta, Portugal, Spain, the UK (will require PVR as from 2010), Bulgaria, Romania, and Croatia.

The Community has signed but not ratified the 1991 VOC Protocol of the Convention on Long-Range Transboundary Air Pollution (CLRTAP), but twenty EU Member States have signed and ratified the protocol, and another seven Member

States have signed but not yet ratified.

According to the protocol's basic obligations, parties are required to implement PVR stage II controls no later than five years after entry into force of the protocol, i.e. by 29 September 2002. Bulgaria, Estonia, Finland and Spain have ratified, but have no national implementation of stage II PVR controls.

On 26 January, the European Parliament's

rapporteur Dimitrios Papadimoulis presented his draft report, in which he wants to bring the deadline forward by five years (to 31 December 2015) and extend the requirement to all existing stations with a throughput greater than 2,000 cubic metres per year.

He also wants to increase the minimum capture efficiency from 85 per cent (as proposed by the Commission) to 95 per cent. This higher level of capture efficiency is already mandatory in Austria, California, Taiwan, China and China, for example.

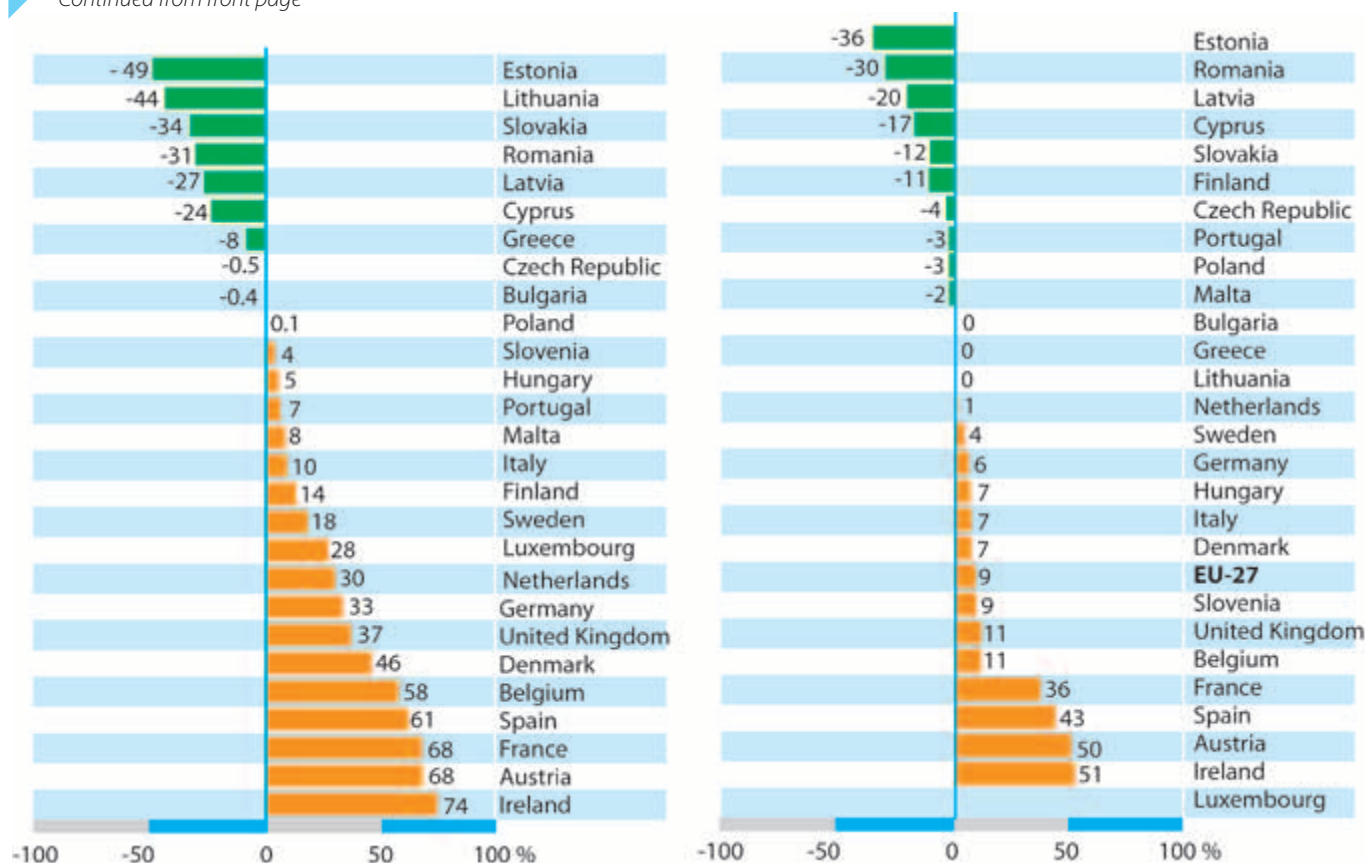
A vote by the parliament's environment committee is scheduled to take place on 31 March, and a vote in plenary is expected sometime in May.

Christer Ågren

The Commission's proposal and background documents are available at: <http://ec.europa.eu/environment/air/transport/petrol.htm>

16 states exceed pollution limits

Continued from front page



Distance to NOx emission ceilings for countries' emission levels in the year 2006 (left), and distance to NOx emission ceilings according to countries' reported projections of emission in 2010 under the "with measures" scenario (right).

tional ceilings for 2010. NOx emissions for the EU27 as a whole are still projected to be nine per cent above the aggregated member state limits (known as the An-

nex I ceiling) and 20 per cent above the stricter ceiling for the EU as a whole (the Annex II ceiling) set for 2010.

Over the period 1990–2006 emissions

rose in four countries: Cyprus, Greece, Portugal and Spain. The largest single polluter was the UK, which alone accounted for nearly 15 per cent of the total emissions. Germany, Spain and France each contributed about 12 per cent.

The shortfall in reaching the ceilings in absolute terms is largest for Spain (364 kilotonnes), France (295 kt) and the UK (127 kt), and in relative terms for Ireland (whose 2006 NOx emissions were 74% above the 2010 ceiling), Austria (68%), France (68%) and Spain (61%).

Even taking into account NOx control measures already in place within the member states, some states including the Netherlands, Sweden and Germany expect to emit only slightly more NOx than their ceilings. Others, such as Ireland, Austria and Spain, are projected to miss substantially their targets by as much as 50 per cent.

According to the EEA, higher than expected growth in road transport is partly to blame. Moreover, the effectiveness of certain vehicle emission controls measures, especially the Euro II and Euro

The NEC directive

The aim of the NEC directive is to limit emissions of acidifying and eutrophying pollutants and ozone precursors in order to improve the protection in the EU of the environment and human health against risks of adverse effects from acidification, soil eutrophication and ground-level ozone.

National emission ceilings for four pollutants – sulphur dioxide (SO₂), nitrogen oxides (NOx), volatile organic compounds (VOCs), and ammonia (NH₃) – are specified with the objective of achieving a range of interim environmental objectives by 2010 compared to a 1990 baseline.

Annex I of the NEC directive defines both country-based ceilings and aggregated emission ceilings for the EU27 (which are the sums of the individual Member State ceilings in that Annex).

Annex II also defines ceilings for the EU27 as a whole, but only for three of the four pollutants (SO₂, NOx and VOCs). These ceilings are stricter than those in Annex I and are designed with the aim of attaining by 2010 the interim environmental objectives set out in the directive.

The directive requires Member States to report information concerning emissions of the four pollutants. The states shall also report expected trends until 2010, the year in which they are to meet their undertakings.

More information on the directive:

European Commission (<http://ec.europa.eu/environment/air/pollutants/ceilings.htm>)

Factsheet from the Secretariat (2004) (<http://www.airclim.org/factsheets/factsheet16.htm>)

III standards for heavy-duty vehicles, turned out to be smaller than originally anticipated.

Despite the fact that the lower than expected effectiveness of these control measures has been widely known since around 2002 or 2003, very few – if any – Member States seem to have taken the needed additional action to compensate for the shortfall.

In fact several countries that expect to exceed their NO_x ceilings by 2010 have not reported on plans to implement additional measures that may allow them to comply with their 2010 ceilings. According to article 6:2 of the NEC directive, any country that is not on track should already have developed and presented such plans by 2006.

Regarding sulphur dioxide the Netherlands is the only country that does not expect, with the current measures in place, to meet its ceilings by 2010, although by implementing additional measures it anticipates meeting the ceiling in time.

Between 1990 and 2006 all member states except Greece report a decrease in emissions. The biggest reductions were reported by Latvia (97%), Germany (90%), Hungary (88%), Denmark (86%), and Italy (77%).

The major polluters were Poland and Spain, which contributed 15 and 14 per cent respectively of total emissions.

The EU as a whole is projected to be 31 per cent below the aggregate ceiling and 27 per cent below the Annex II ceiling.

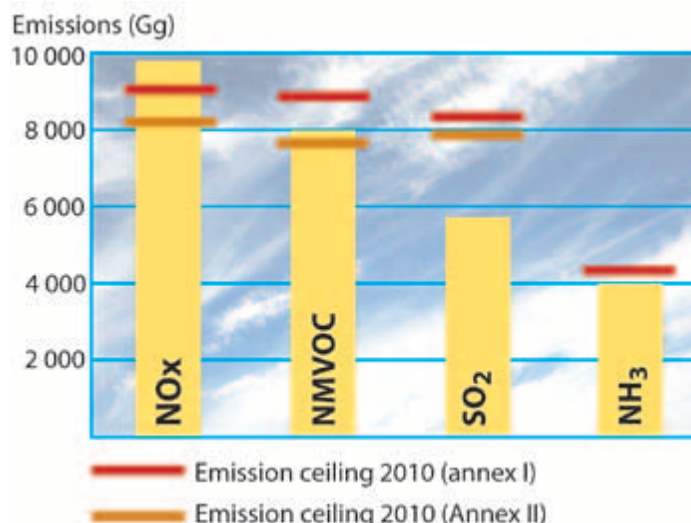
Five member states – Denmark, France, Poland, Portugal, and Spain – report that they do not envisage meeting their VOC ceilings in 2010. Two countries – Greece and Portugal – increased their emissions during the period 1990–2006.

The biggest single polluters were Germany and France, each accounting for nearly 15 per cent of the total emissions.

The projections for the EU as a whole are nine per cent below the aggregated ceiling target of Annex I, but six per cent above the Annex II ceiling.

Twenty member states have already reduced ammonia emissions below their respective ceilings for 2010. Germany and

Aggregated “with measures” projected emissions for 2010 reported by Member States compared with the EU27 combined emission ceilings as given in Annex I and Annex II of the NEC directive.



Spain report that they will not reach the target for 2010 with the current measures in place. The projections for the EU27 are seven per cent below the aggregated EU emission ceiling.

Inadequate reporting by several countries

“Nitrogen oxides continue to pose the greatest challenge, with thirteen member states predicting they will miss their national ceilings for 2010.”

makes comparisons and forecasts for the EU as a whole unreliable. Amongst the fourteen member states that provided emission estimates for the years 1990 and 2006, Italy, Spain and Cyprus report increased emissions, whilst all other countries reported decreases.

Only eighteen out of 27 member states met the required reporting deadline of 31 December 2007. Ten countries provided additional or revised data between January and July 2008. Only nine member states submitted emission inventories in a comparable and consistent format, while the remaining eighteen states submitted data using a variety of non-standard formats.

To help improve transparency, the EEA

suggest that future reporting by member states could include a short informative report with explanatory information. It also suggests that a definition of formats for emission inventory reporting should be included in the forthcoming revised NEC directive.

Based on its Thematic Strategy on Air Pollution from September 2005, the European Commission spent nearly three years preparing a proposal for a revised NEC directive – the main intention being to set new (stricter) emission ceilings for 2020, and expand the number of air pollutants covered from four to five by adding fine particles (PM_{2.5}).

For various reasons the proposal has been postponed several times, and in June 2008 the Commission had a draft proposal ready, but decided again to postpone (*see AN 3/08*). The Commission has so far failed to explain why the draft new legislation was again delayed or when it is expected to be published.

Christer Ågren

NEC Directive status report 2007. EEA Technical report No. 9/2008. Published by and available from the European Environment Agency. See: http://www.europa.eu/publications/technical_report_2008_9

Climate package: strong structure, weak numbers

The final agreement on the EU climate package retains the goal to reduce emissions by 20 per cent. Together with a 20-per-cent share of renewables and 20-per-cent energy savings, this creates the triple goal of 20-20-20 by 2020.

The EU climate package was finally agreed in December, despite some last-minute drama, mostly in accordance with the Commission's January proposal. It means that the EU now has a strong climate policy framework. However, the agreed limits are inadequate to reliably achieve the 2°C climate target, according to the environmentalists, who also believe that measures in other countries, mainly through the CDM, have been given too big a role.

If the press is to be believed, the entire climate package was at risk of crumbling under pressure from the new Member States and from Italy. This never came about and the EU's unconditional goal to reduce emissions by 20 per cent was retained. Together with a 20-per-cent share of renewables and 20-per-cent energy savings, this creates the triple goal of 20-20-20 by 2020.

The promise to make reductions of 30 per cent if other nations make similar undertakings was also retained.

The allocation of emission targets between the member states has been agreed. (*see map*). Member states have additional binding targets for renewable energy sources and energy efficiency measures.

For many big companies the regulations governing emissions trading set clear requirements to reduce emissions by emissions trading. The car industry faces demands to reduce the emissions of new cars.

The package also provides regulation for the storage of carbon dioxide and some funding for CCS (Carbon Capture and Storage) demo plants.

The package, which was first adopted by the Council and then by Parliament in December, consists of four sets of legislation:

- Trading in emissions rights for greenhouse gases¹.
- Common initiatives to reduce greenhouse gas emissions².
- Geological storage of carbon dioxide³.
- Emission standards for new passenger cars⁴.

One of the most important elements of the package (under Common initiatives...) is the use of effort sharing to achieve a 20-per-cent reduction.

If the EU is to cut emissions by 30 per cent the entire package will have to be renegotiated in spring 2010.

Emissions trading accounts for two billion tonnes of EU emissions, which total around 5.1 billion tonnes of CO₂ equivalents. Some progress has already been made towards the 20-per-cent cut from 1990 levels, and a further 14-per-

cent reduction is required from 2005. The trading sector must make cuts of 21 per cent or 457 megatonnes from 2005 emission figures, while the non-trading sector must make reductions of 10 per cent or 310 megatonnes.

The Member States cannot influence emissions in the trading sector. Effort sharing applies to the non-trading sector. The reductions must be achieved either in the EU or partly through projects in other countries, corresponding to a maximum of three percent of 2005 emissions from the non-trading sector. This nevertheless represents a large share, roughly half of the reduction required by 2020.

In addition, most countries can use a further one per cent for projects, but only in the poorest countries or poor island states and subject to a string of conditions. It therefore seems doubtful

Environmental movement:

-Shame on EU leaders

The environmental movement was extremely critical of the package. In a joint press release by Climate Action Network, WWF, Greenpeace, Friends of the Earth and Oxfam, entitled "Shame on 'EU leaders'" they asserted that 20 per cent, and even 30 per cent, is too little to meet the 2°C target. They also stated that an unacceptably high share of the reduction – "around two thirds" – could be achieved by using CDM credits.

Greenpeace commented in a press release on 17 December that the legislation on car emission standards had been watered down as a result of lobbying by car manufacturers. The deadline (2015 compared to 2012 under the original proposal), the level of fines and the

reduction target (130 rather than 120 grams) have all been changed.

WWF said the climate package was "poisoned by the large amount of carbon credits allowed from non-European countries," focusing actions away from Europe and giving a bad example to the rest of the world.

Greenpeace warned that the package could not be taken as a basis for the EU's negotiation position in Copenhagen in 2009, as it did not even guarantee the achievement of the EU's emissions reduction target of 20 per cent, let alone 30 per cent, which it said was generally recognised as the bare minimum to combat global warming.

whether this percentage will actually be used to any great extent. It does however open the possibility that the EU could achieve more than half its undertaking in other countries.

Energy efficiency must be improved by 20 per cent “compared with forecasts for 2020”, according to the hardly crystal-clear explanation given under “Common initiatives”. The Commission will get back with an evaluation of the national energy efficiency plans and new proposals by 2012.

This does not mean that everything is on hold. In autumn 2008 the Council urged the Commission to propose a ban on incandescent bulbs under the framework of the Eco-Design directive. The national experts gave their backing to this requirement.

As concerns emissions trading the revised directive on emissions trading states that the majority of rights must be auctioned instead of being allocated free of charge, as in the past. The Commission is also to take a decision on the criteria for free distribution, particularly to some sectors of high-carbon industry where competition is strong.

This means that the emissions trading system will *in theory* become a very strong incentive, but it remains to be seen just how effective it is in practice. During the first trading period of 2005–2007 the first priority was to get the machinery in place. This led to overly generous allocation and eventually to a collapse in prices. In the run-up to the second trading period, 2008–2012, the Commission examined the plans much more actively and cut back allocations in most countries, but retained the national allocation plans. In the third period the energy sector will have to buy all its rights at auction, with a few exceptions. The exceptions apply to Poland, Estonia, Latvia and Lithuania, for whom free allocations will be ramped down and disappear completely by 2020.

Harmonized rules will apply to the whole of manufacturing industry, including steel, cement, lime, and aluminium producers.

Opportunities for Member States to

EU climate package, national targets



National targets for emission reductions and renewable energy according to the new EU climate package.

look after “their own” industries are thus greatly reduced. This also increases the collective ability of the EU to deliver large reductions in emissions.

The difficulty lies with the numbers. To achieve a 20-per-cent reduction in greenhouse gas emissions over the period 1990–2020, trading in emissions rights must deliver a reduction of 21 per cent between 2005 and 2020.

Problems have quickly surfaced. The price of emission rights plummeted from 20–30 euro per tonne for most of 2008 to 8–10 euro in February 2009. This not only applies to spot prices but also futures. This is to some extent due to the economic crisis, but naturally means less incentive for change. Because surplus emission rights can be saved until 2020 at least, today’s prices also say something about the way the market expects things to turn out in the longer term.

Investments in low-carbon technology require a higher and more stable price for

emission rights. One of the methods in which many EU governments are putting a lot of faith is Carbon Capture and Storage (CCS). One common estimate is that CCS will not become profitable until the price of emissions rights reaches 30–35 euro/tonne. It is even difficult for many forms of renewable energy to compete with fossil fuels when the price of emission rights is so low.

Emission credits from projects may also be used in the trading sector. This represents roughly half of the reduction, in other words around 130 million tonnes per year, or a total of roughly 1.6 billion tonnes for the period 2008–2020. The CDM will also apply to new participants and new sectors, although its effect is unclear.

The package does not rely entirely on emissions trading and national undertakings for the non-trading sector.

In the case of renewable energy the EU must achieve at least a 20-per-cent share by

2020. Each country will be given a binding target, expressed as a percentage of total energy use. This means drastic changes for many countries (*see map*).

The action plans of the member countries must be complete by 30 June 2010. The Commission will specify the information the plans must provide on 30 June 2009.

There are opportunities to meet part of the undertaking through common initiatives within the EU and by building power plants in countries outside the EU, but only if the electricity is used in the EU. In other words constructing a wind farm in China will not count under this directive, but the construction of a wind farm in Norway or solar power plant in Algeria would, assuming that power could be transmitted satisfactorily.

The directive also establishes that renewable electricity must be given guaranteed or priority access to the grid.

The EU does not take any position on whether the increased share of renewables should be achieved through feed-in tariffs, as in Germany, Spain and other countries, or by a quota system, as used in Sweden and Great Britain, for example.

Each member state must also have a renewable energy share of at least 10 per cent in the transport sector. It is clear however that the EU has taken note of the criticism levelled against biofuels.

Extensive sustainability requirements are set out for biofuels, regardless of whether they are grown in the EU or imported. The Commission will report to Parliament on compliance with these sustainability criteria every alternate year from 2012.

Biofuels may not be counted as fully renewable if they give rise to greenhouse gas emissions during their lifecycle. As a standard value, it is assumed that biofuels reduce greenhouse gas emissions by 35 per cent, unless better values can be proven.

Electric vehicles and hydrogen vehicles are particularly encouraged, since electricity that is used for this purpose may be multiplied by a factor of 2.5. This is based on a conventional coal power plant having an efficiency of roughly 40 per cent, which makes it more profitable to replace

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fossil fuel with renewable power than to replace petrol with ethanol.

The main purpose of the CCS directive is to ensure consistent regulation of carbon capture and storage. An emission limit for new power plants of 350 grams/kWh was proposed in the report by Parliament (Chris Davies, British liberal democrat). This would have meant a ban on new coal power plants without CCS, but permitted efficient fossil gas power plants. New coal power without CCS thus remains a big possibility – a possibility that many power companies are of course banking on.

In other respects the potential for CCS is governed mainly by the emissions trading directive.

Revenues from the sale of up to 300

million emission rights will be taken from reserve for newcomers to the trading system and distributed to as many as 12 CCS demo plants or projects that demonstrate innovative renewable energy technologies. At an emission price of 10 euro this totals three billion euro.

This is not such good news for CCS as it may seem. The figure was cut from 500 to 300 million rights and at the same time the value has fallen sharply as a result of the price drop in emission rights.

Parliament also wanted half the revenues from auctioning to be earmarked for a variety of purposes, including CCS. But this figure was whittled down to 12 per cent, to be used for climate policy measures in poorer EU countries.

At the end of January the Commission

The road to Copenhagen

On 28 January the Commission issued a press release on the EU's targets for a climate agreement in Copenhagen.

The release stresses that the 2°C target may call for very drastic reductions in emissions and that new research shows stabilization may require levels to be reduced as low as 350 ppm CO₂ equivalents. This would not only mean a reduction in emissions but also in the current levels.

According to the press release, worldwide emissions must peak before 2020 and fall by more than 50 per cent by the year 2050.

Some of the main points:

- The target is that the developed countries at the Copenhagen climate summit should reduce their emissions by 30 per cent by 2020, taking 1990 as the base year, and that other countries should reduce their emissions by 15–30 per cent compared to business as usual.
- One obvious consequence will be increased pressure on the project mechanisms. Despite this, or possibly in response, the Commission is recommending reforms to the CDM, and indirectly levelling harsh criticism at the way it currently operates:
- To ensure environmental integrity, the

CDM should be reformed, crediting only those projects that are additional and go beyond low cost options.

In addition, for advanced developing countries and highly competitive economic sectors, the project-based CDM should be phased out in favour of moving to a sectoral carbon market mechanism.

These sectoral mechanisms are not specified, but refer to a form of emission trading between, say, ore-based steelworks, that enables those with lower than average emissions per tonne to sell their rights to those with higher emissions. Sectors that are responsible for high emissions include steelworks, cement works, aluminium plants and oil refineries. Emissions per tonne of product vary considerably between production units, but not as widely between countries.

International aviation and shipping are not covered by the Kyoto system, and the Commission wants to change this.

The EU would also like to see international trade in emission rights extended by 2015 to include the entire OECD, which roughly corresponds to the rich nations of the world and mostly encompasses those countries that currently have undertakings under the Kyoto Protocol. The Commis-

sion initially wants to set up a working committee with the USA.

It is also hoped that agreement in Copenhagen will result in a framework to help countries to adapt to the unavoidable aspects of climate change. Every country will have to develop adaptation strategies, and the most vulnerable countries should receive technical and economic aid.

Energy-related research and development should be doubled by 2012 and quadrupled by 2020, according to the Commission.

The Commission estimates that reducing emissions will require additional investments of around 175 billion euro per year, more than half of which will be needed in developing countries. Tax-funded measures in developing countries must be comparable and fair, and should be negotiated as part of the Copenhagen agreement.

The environmental movement has shown a fairly positive response to the release, but Greenpeace commented, for example, that it lacked clear commitments on the question of funding for developing renewable energy sources in developing countries.

Fredrik Lundberg

proposed that 1,250 million euro from unused agricultural subsidies in the 2008 budget should be used for CCS projects, but no decision has been reached.

Of the other possibilities for reducing emissions, no decision was reached on nuclear power, as expected. Nuclear power is in any case influenced by both emissions trading, which slightly favours nuclear power, and by the renewables directive, under which nuclear power makes it more difficult to achieve targets. The energy efficiency target probably also works against nuclear power most of the time. In Sweden, for example, increased nuclear power generation that results from increasing capacity by 1 TWh would require a corresponding 1 TWh increase

in wind power output. But if electricity consumption were to increase at the same rate it would be very difficult to meet the energy efficiency target. Exporting nuclear power does not provide any solution to the problem either, since the origin of all electricity must be identified. If Germany, for example, imports Swedish nuclear power it is added to other non-renewable sources of energy.

The legislation on emissions standards for new passenger cars sets a target of 130 grams/km for the average new car by the year 2015. This will be reduced to 95 grams in 2020.

It is assumed that a further 10-gram reduction can be achieved by using bio-fuels, for example. Significant penalties

are imposed per car if emission targets are exceeded.

Manufacturers of cars with very low emissions (less than 50 grams/km) will receive "super credits", meaning that one of these cars will count as 3.5 normal cars. This is a further move to favour electric and hybrid cars that mostly run in electric mode.

Fredrik Lundberg

¹ ETS: MEMO/08/796

² Effort-sharing: MEMO/08/797

³ CCS: MEMO/08/798

⁴ CO₂ from passenger cars: MEMO/08/799



Without binding emission standards, there will be new chimneys in Europe.

Carbon limit proposed for large power plants

Binding emission standards for all large plants - new and existing - could reduce greenhouse gas emissions from the power sector by two thirds.

A carbon dioxide emission limit for power plants should apply to both new and existing installations if it is to have a significant impact on reducing emissions by 2030, according to a study published by environmental consultants Ecofys.

Introducing binding emission performance standards (EPS) for all large power stations in the EU on a staged basis between 2010 to 2020, could reduce the sector's greenhouse gas emissions in 2020 by more than two-thirds – or more than 800 million tonnes per year – in 2020, according to environmental organisation WWF, one of the sponsors of the study.

“The current EU emissions trading scheme unfortunately does not prevent high polluting coal-fired power stations from being built,” said Stephan Singer, director of WWF's Global Energy Programme. *“We need new emissions limits to ensure Europe invests only in renewable energy, energy efficiency, and CO₂ capture and storage facilities for coal-fired power stations. Otherwise, Europe will fail*

to deliver its contribution to keeping global warming below 2 degrees Celsius.”

A CO₂ emissions performance standard is a limit on emissions per unit of energy output. With such a limit, new power plants that cannot meet the standard would not be built and existing power plants that do not plan to upgrade pollution controls or implement equivalent measures would close down. Utilities will have clear incentives to invest in energy efficiency measures, equip their new plants or retrofit the existing ones with CO₂ capture and storage or switch to renewable sources of energy.

The study shows that an EPS needs to be phased in for both new and existing plants. Imposing a very demanding limit of 150 grams CO₂/kWh just on new plants from 2010 would deliver reductions of 10 per cent of power sector greenhouse gas emissions by 2020, while a staged introduction of a less stringent standard

at 350 grams CO₂/kWh for new plants from 2010, extended to existing plants by 2015, could save up to 46 per cent of power sector emissions by 2020.

The Environment Committee of the European Parliament supported a proposal to include a binding EPS for CO₂ emissions from power plants last October, as part of legislative proposals for an EU framework for carbon capture and storage (CCS), but the proposal was rejected by EU governments.

More recently, some MEPs in the parliament's environment committee proposed to introduce such a standard for large new power plants in connection with the ongoing revision of the EU's 1996 integrated pollution prevention and control (IPPC) directive.

The report **Scenarios on the Introduction of CO₂ Emission Performance Standards for the EU Power Sector** can be downloaded from: <http://www.ecofys.com/>

One per cent of GDP will save the climate

A new study shows that global warming can be kept below the critical 2°C rise at a cost of well below one per cent of the global gross domestic product (GDP).

A new study by McKinsey and Co shows that global warming can be kept below the critical 2°C rise and that it is well within our means to do so. The study spells out in detail the costs of cutting damaging carbon emissions, but makes it clear that only by acting now will we avoid the worst impacts of climate change.

“Every year of delay adds to the challenge, not only because emissions will continue to grow during that year, but also because it will lock the economy into high-carbon infrastructure,” said the report.

The report lists more than 200 opportunities, spread across ten sectors and twenty-one geographical regions, which could cut global greenhouse gas emissions by about 40 per cent below 1990 levels by 2030.

By 2030, wind, solar and other sustainable renewable sources of energy could provide almost a third of all global power needs. Energy efficiency could reduce greenhouse gas emissions by more than a quarter, and deforestation in developing countries – one of the biggest drivers of climate change and a major threat to sustainable development – could be almost fully halted. And all at a cost of less than half a percent of the world’s Gross Domestic Product (GDP), a measure of the market value of all goods and services.

“The McKinsey study shows once and for all that taking action on climate change is both urgent and affordable,” said WWF director James Leape. *“The figures show clearly that not only can we move to a low-carbon economy, but that the costs are manageable. Adopting these measures will*

be a major step towards avoiding the worst effects of climate change.”

Findings are presented in the form of



an “abatement cost curve” which graphically illustrates the sectors where the most cost-effective carbon reductions can be made, including saving 14 billion tonnes of CO₂ by replacing carbon-based power generation with – amongst other things – existing and proven clean, renewable energy; 14 billion tonnes through more sustainable use of land in the agriculture and forestry sectors; and 11 billion tonnes from energy efficiency. Another 9 billion tonnes of potential emission reductions are identified, which either are more expensive or represent behaviour changes that are difficult to quantify.

McKinsey analyses the potential for emission abatement across all sectors

including nuclear power. WWF believes however that the costs for nuclear have been underestimated, and moreover states that nuclear power is not a viable option when the risks from proliferation, highly radioactive waste and plutonium leaks are taken into consideration.

In addition, WWF believes that further substantial reductions are possible from combined heat & power (CHP) biomass, better energy efficiency, and low-carbon products which will protect the climate without the need for nuclear power.

If all the technology options listed in the study were put into practice, it would be possible to achieve a global reduction of approximately 40 per cent of greenhouse gas emissions by the year 2030 compared with 1990 levels – which equates to a 70-per-cent reduction from “business as usual” levels. That would be enough to put the world on track to keep global average temperature rises below the 2°C level which has been identified as the maximum allowable before widespread irreversible environmental damage kicks in.

Source: WWF press release, 26 January 2009
<http://www.panda.org/>

The report **Pathways to a Low Carbon Economy** was supported by ten global companies and organizations: The Carbon Trust, Climate-Works, Enel, Entergy, Holcim, Honeywell, Shell, Vattenfall, Volvo, and WWF. It can be downloaded from: <http://globalghgcostcurve.bymckinsey.com/>

European ecosystem sensitivity mapped

Excess nitrogen deposition in the EU is threatening the sustainability of natural ecosystems over an area of more than one million square kilometres.

The efforts of the last few decades to reduce air pollutant fallout in Europe, which have resulted in a number of important international agreements as well as EU legislation, have depended to a large extent on the mapping of critical loads.

Critical loads are scientific estimates of the amounts of pollutants that various ecosystems can tolerate without being harmed – sometimes also referred to as the limits on what “nature can tolerate”.

Based on reports from the various countries, the Coordination Centre for Effects (CCE) under the Convention on Long-range Transboundary Air Pollution (LRTAP) produces Europe-wide critical load maps, and in a new report¹ the CCE provides updated European maps of this type for acidity and nutrient nitrogen (*see figure 1*).

The report also contains maps and tables showing the extent to which the critical loads for deposition of acidity



European ecosystems still need it.

and eutrophication were exceeded in the year 2000 (*figure 2*), and what can be expected in 2010 and 2020 (*see table*) if every country fulfils its undertakings

in accordance with the 1999 Gothenburg Protocol to the LRTAP Convention and existing EU air quality legislation.

Due to a number of developments, including improvements in the scientific input, the estimate of ecosystems' exposure to depositions that exceed their critical loads is changing over time. It appears from these changes in methodology and input data that the real extent of the problem had previously been underestimated.

It is estimated that the critical limit value for acid deposition was exceeded over approximately 19 per cent, or 368,000 square kilometres (km²) of the ecosystem area in the EU27 in 2000. As a result of foreseen emission reductions, by 2010 this area is expected to shrink to 213,000 km² and by 2020 to 174,000 km² (9 % of the area).

In the year 2000 the critical loads for nitrogen eutrophication were exceeded

Table: Ecosystem area at risk of acidification and eutrophication in 2000 and for two emission scenarios: current legislation (CLE) in 2010 and 2020, and maximum technically feasible reductions (MTFR) in 2020.

ACIDIFICATION								
	2000		2010CLE		2020CLE		2020MTFR	
	%	km ²	%	km ²	%	km ²	%	km ²
EU27	19	368,100	11	213,100	9	174,300	2	38,700
Europe	11	464,500	7	295,600	6	253,400	1	42,200
EUTROPHICATION								
	2000		2010CLE		2020CLE		2020MTFR	
	%	km ²	%	km ²	%	km ²	%	km ²
EU27	74	1,198,700	69	1,117,700	64	1,036,700	28	453,500
Europe	49	1,893,400	48	1,854,700	47	1,816,100	17	656,900

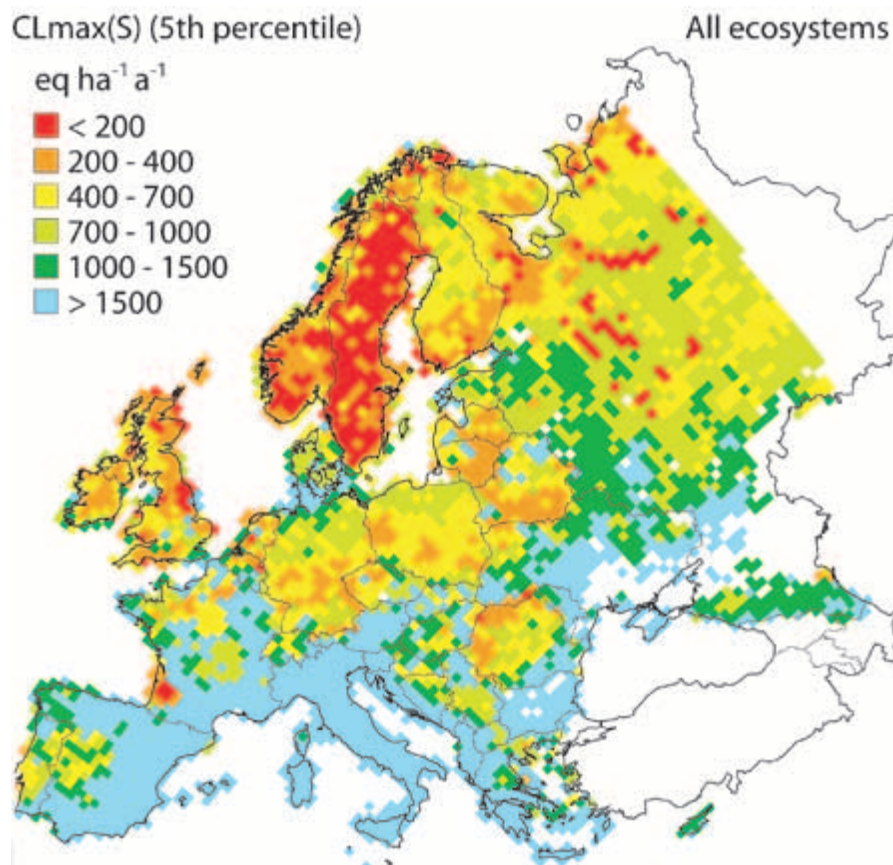
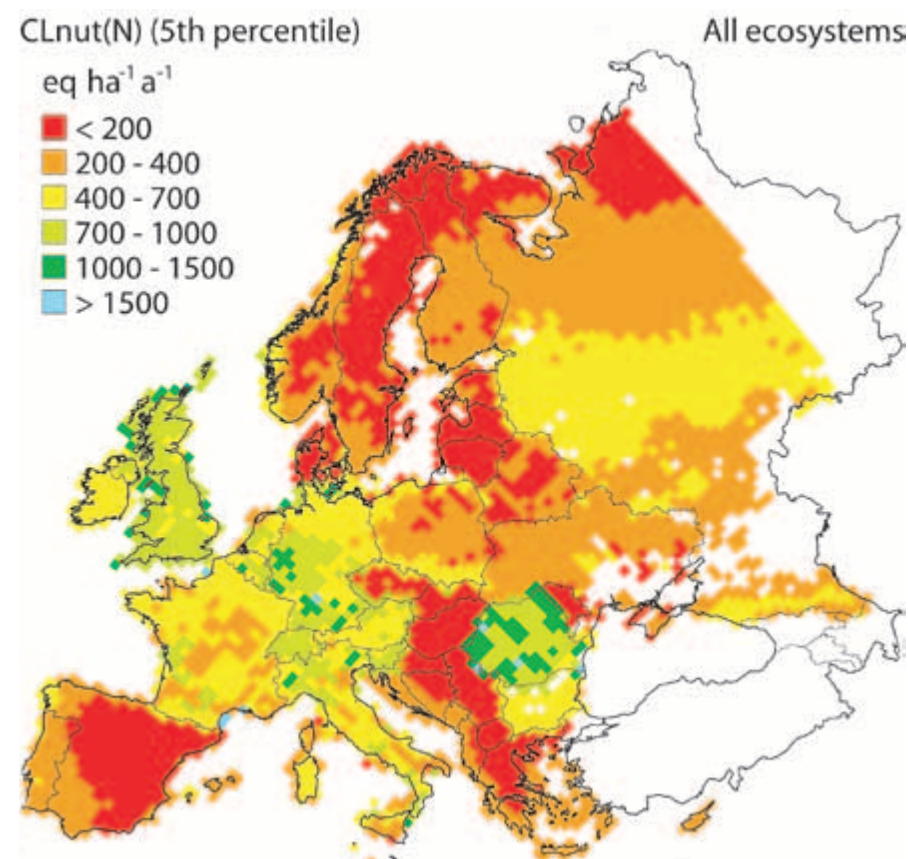


Figure 1. Critical loads for acidity (top) and nutrient nitrogen (bottom) in Europe.

The acidity map shows the deposition of hydrogen ion equivalents that sensitive ecosystems (e.g. forest soils and surface waters) can tolerate without being acidified. The nitrogen map shows the deposition of nitrogen equivalents that sensitive ecosystems (e.g. forest soils and heathlands) can tolerate. At each load level 95 per cent of the ecosystems in the relevant square are protected. In red shaded areas annual deposition needs to be lower than 200 equivalents per hectare to achieve the protection target.



Study reveals truth about trucks

Lorries cause far more environmental damage and congestion than previously thought, and are twice as likely to kill than cars, according to a report published on 12 January by Transport & Environment (T&E).

Carbon dioxide emissions from European road freight are predicted to increase 54 per cent by 2030 according to the study, conducted by Dutch consultants CE Delft. It also found that lorries are responsible for 20 per cent of road congestion in the EU, despite representing just three per cent of road vehicles. Per kilometre driven, trucks were found to be responsible for twice the number of deaths as passenger cars.

The report "**Are trucks taking their toll? The environmental, safety and congestion impacts of lorries in the EU**" is available to download from: www.transportenvironment.org/publications

Dirty air costs California US\$28 billion annually

Air pollution costs the California economy more than US\$28 billion annually, according to a recent study. The study, which focuses on the South Coast and San Joaquin Valley air basins, also found that the life- and health-threatening pollution in these regions contributes to more than 3,800 premature deaths each year.

The research determined the benefits of attaining federal ozone and PM_{2.5} air-quality standards by identifying and quantifying the links between air quality and exposure, exposure and ill health, and ill health and the resulting economic losses.

Source: "**The Benefits of Meeting Federal Clean Air Standards in the South Coast and San Joaquin Valley Air Basins**". The executive summary and full report can be found online at <http://business.fullerton.edu/centers/iees/>

The cost of ozone damage to crops

Ozone pollution caused significant damage to crops in the year 2000 and greater reductions in yields are predicted for 2030 for some regions of the world. In 2000, the global economic value of crop losses through surface ozone was estimated to be between US\$14 and \$26 billion, with 40 per cent of this cost occurring in China and India.

Source: **The global impact of ozone on agricultural yields under current and future air quality legislation** (2009). Van Dingenen, R., Dentener, F.J., Raes, F. et al. *Atmospheric Environment*. Doi:10.1016/j.atmosenv.2008.10.033.

over an area of roughly 1.2 million km², or 74 per cent, of ecosystems in the EU27. According to emission projections based on current legislation, little further improvement is expected in the near future – the area exposed to nitrogen overload will stabilize at around 1.1 million hectares up to 2020.

In this context it should be noted that EU member states and the countries that have ratified the Gothenburg Protocol have agreed that non-exceedance of critical loads is their long-term goal.

The effects of excess nitrogen deposition on species diversity and ecosystem functions are tentatively described in the report.

By using so-called dynamic modelling it is possible to illustrate not only where ecosystems are at risk, but also the time that will be needed for recovery. Dynamic models can also show the extent of emission reductions that are required to achieve ecosystem recovery by a given target year.

The CCE report provides a description of the developments in dynamic modelling, including illustrative calculations on recovery potentials by 2030 and 2050.

It also provides an assessment of critical loads and critical load exceedances for the three heavy metals cadmium, lead and mercury. The area covered by this mapping has recently been expanded to include most of Russia and the countries of Eastern Europe, Caucasus and Central Asia (EECCA).

Christer Ågren

¹ **Critical Load, Dynamic Modelling and Impact Assessment in Europe.** CCE Status Report 2008. Eds. J-P. Hettelingh, M. Posch and J. Slootweg. Coordination Centre for Effects under the Working Group on Effects of the Convention on Long-range Transboundary Air Pollution. Netherlands Environmental Assessment Agency Report 500090003. Published by Netherlands Environmental Assessment Agency, Bilthoven, Netherlands.

CCE has a website, from which all its status reports can be downloaded: www.pbl.nl/cce. For example, an overview of the way the critical load maps are produced was described by the centre in its 2003 Status Report: Modelling and Mapping of Critical Thresholds in Europe.

Exceedance of acidity CLs

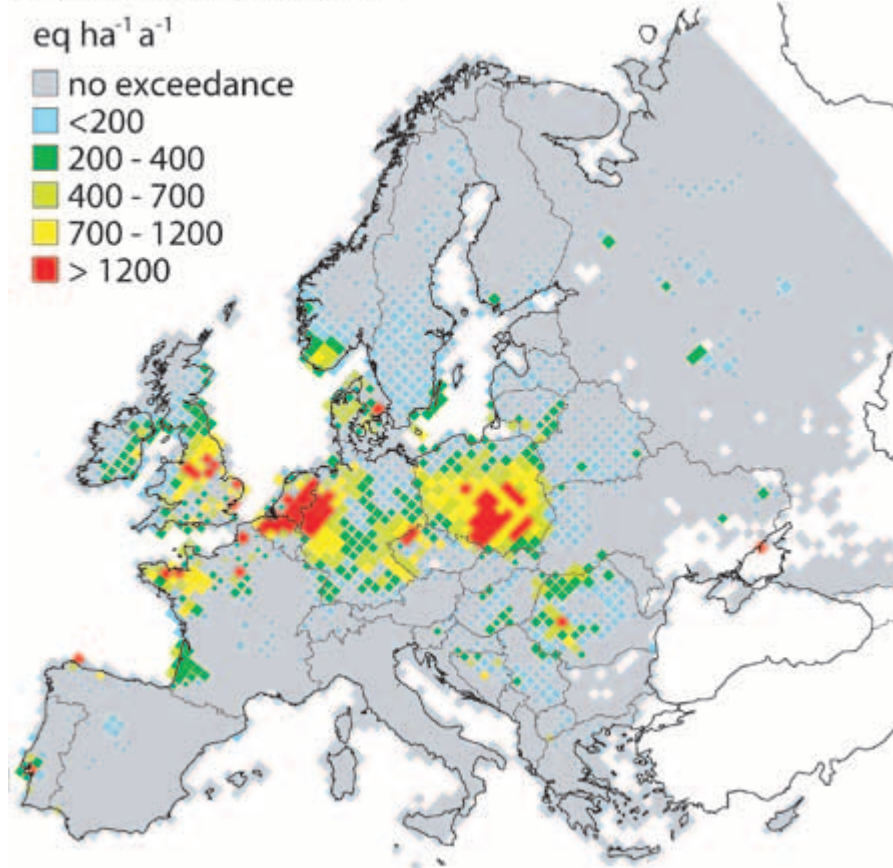
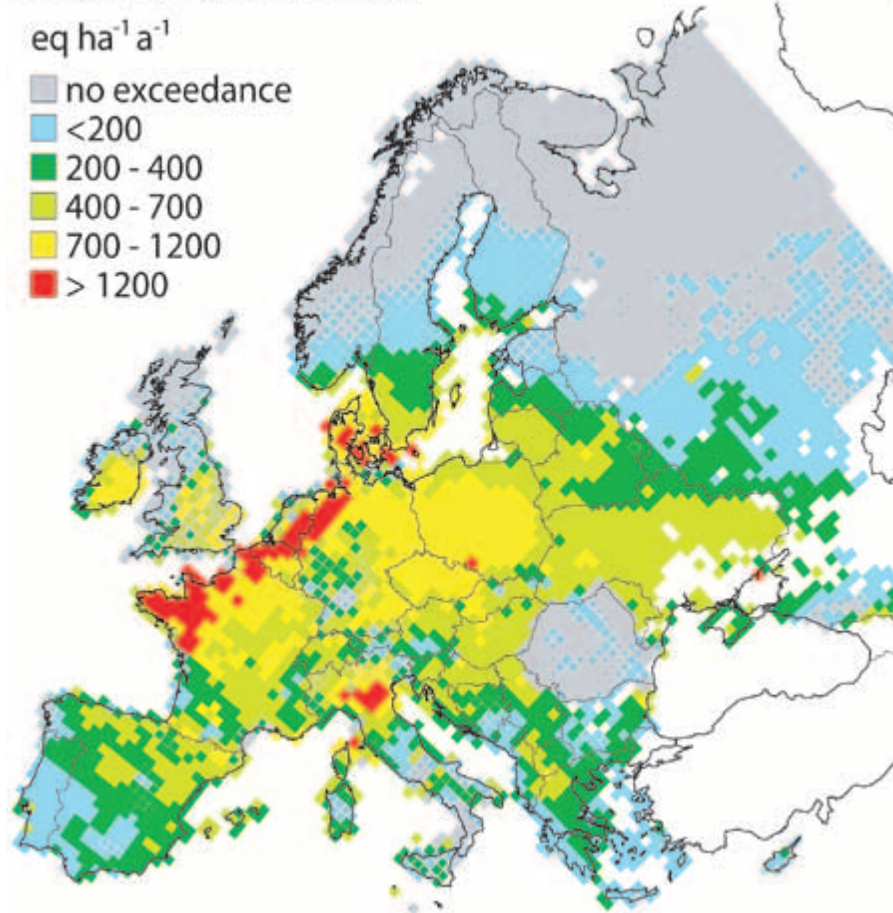


Figure 2. Areas where the critical loads for acidity (top) and nitrogen (bottom) were exceeded in 2000.

Exceedance of nutrient CLs



Asian brown cloud affects food safety for billions

Man-made brown clouds are jeopardizing human health and food production for three billion people in Asia.

Cities from Beijing to New Delhi are getting darker, glaciers in mountain ranges such as the Himalayas are melting faster and weather systems becoming more extreme, in part, due to the combined effects of man-made Atmospheric Brown Clouds (ABCs) and greenhouse gases in the atmosphere.

The brown clouds, the result of burning of fossil fuels and biomass, are in some cases and regions aggravating the impacts of greenhouse gas-induced climate change, says a new report from UNEP. Emissions of some fine particles (such as black carbon and soot) absorb sunlight and heat the air. Similarly, the formation of gases such as ground-level ozone also enhances the greenhouse effect.

The clouds are also having an impact on air quality and agriculture in Asia, increasing risks to human health and food production for three billion people. It is estimated that the elevated levels of ground-level ozone could result in crop losses of up to 40 per cent in Asia.

Brown clouds contain a variety of toxic aerosols, carcinogens and particles, including fine particulate matter (PM_{2.5}). These have been linked with a variety of health

effects, including respiratory disease and cardiovascular problems.

As regards outdoor exposure, increases in concentrations of PM_{2.5} of 20 micrograms per cubic metre could lead to about 340,000 additional deaths per year in China and India. The economic losses due to outdoor exposure to ABC-related PM_{2.5} have been crudely estimated at 3.6 per cent of the gross domestic product (GDP) in China and 2.2 per cent of that in India.



The great wall of China - we think....

JON R. PETERS/PHOTOLIA.COM

The World Health Organization estimates that over 780,000 deaths in the two countries can be linked to indoor exposure to air pollutants resulting from solid fuel use in the home.

“One of the most serious problems highlighted in the report is the documented retreat of the Hind Kush-Himalayan-Tibetan glaciers, which provide the headwaters for most Asian rivers, and thus have serious implications for the water and food security of Asia,” said professor V. Ramanathan, head of the scientific panel carrying out the research.

The report “Atmospheric Brown Clouds: Regional Assessment Report with Focus on Asia” can be found at www.unep.org

Surge in birth defects in China

Chinese officials recently told the state media that birth defects are increasing at an alarming rate and that a major reason was degradation of the environment. Environmentalists say that the leading culprit is China's dependence on coal and that birth defects are highest in coal-producing regions such as Shanxi and Inner Mongolia.

A study by the National Population and Family Planning Commission released in 2007 found that birth defects had increased nearly 40 per cent from 2001 to 2006, coinciding with the country's explosive economic growth.

Source: Los Angeles Times, 2 February 2009

Cleaner Air Equals Longer Lives

Between 1980 and 2000, average life expectancy increased by 2.72 years in 51 US cities, and 15 per cent, or approximately five months, of that gain owed to cleaner air, according to a new study.

The average levels of fine particulate matter (PM_{2.5}) in the cities studied dropped from 21 to 14 micrograms per cubic metre (µg/m³) during the 1980s and 1990s. A decrease of 10 µg/m³ was associated with an estimated increase in mean life expectancy of 7.3 months.

Cities that had previously been the most polluted and saw the most extensive clean-ups added an average 10 months to residents' lives. Health gains were also found in cities that initially had relatively clean air but then made further improvements in reducing air pollution.

“Such a significant increase in life expectancy attributable to reducing air pollution is remarkable,” said Arden Pope, an epidemiologist and lead author on the study.

Source: Fine-Particulate Air Pollution and Life Expectancy in the United States, The New England Journal of Medicine, Volume 360:376-386, 22 January 2009.



MATTEO NATALE/PHOTOLIA.COM

Going fast - but only on the road....

Slow pace of car CO₂ cuts

The average emission level of new private cars registered in the EU in 2007 was 158 grams per kilometre (g/km), down 1.25 per cent compared with 2006, according to a European Commission report dated 27 January.

The Commission's emission monitoring reports were originally conceived to track manufacturers' progress towards a voluntary reduction target of 140g/km by 2008. The reports will now be used to measure the industry's compliance with new legal limits on CO₂ emissions from new vehicles - 130 g/km by 2012-2015.

Coal-fired power plants still heavy polluters

Large combustion plants are responsible for two thirds of EUs total sulphur emissions, and the coal-fired top ten polluters account for 30 per cent.

In 2006 almost 30 per cent of the large combustion plants in the EU have – according to member states’ reports – operated above the binding emission limit values for SO₂ and NO_x set by the large combustion plants (LCP) directive.

Large combustion plants are responsible for two thirds of the EU’s total emissions of sulphur dioxide (SO₂), and for one fifth of those of nitrogen oxides (NO_x).

As part of the requirements of the large combustion plant directive (*see box*), member states are required to establish an inventory of emissions of sulphur dioxide, nitrogen oxides and dust from all plants covered by the directive. They must also report the total annual amount of energy input broken down into five categories of fuel: biomass, other solid fuels, liquid fuels, natural gas and other gases.

A summary of this inventory has to be reported to the Commission every three years, with refineries reported separately. The first inventory covered the period 2004–2006, and the deadline for reporting was 31 December 2007.

This reporting by member states has been compiled and evaluated by the UK environment consultancy Entec, and the results published in a report which can be downloaded from the Commission’s website (*see below*).

As regards total emissions from these plants, it was found that over the 2004–2006 period, dust emissions decreased most markedly (–23%), followed by SO₂ emissions (–8.6%), whilst the total NO_x emissions decreased only marginally (–1.8%).

Emissions were attributed to four different capacity classes. Not surprisingly, the majority of emissions emanated from the largest plants, i.e. those with a thermal capacity of more than 500 megawatts (MW_{th}). These are mostly public electricity generation plants, and were found to

SO ₂	State	Thermal capacity (MWth)	Annual SO ₂ emissions (Ktonnes)
1. TPP “Maritsa Iztok 2”	Bulgaria	4 312	310.2
2. CT AS Pontes	Spain	3 800	295.0
3. TPP “Maritsa Iztok 3”	Bulgaria	2 420	183.7
4. CT Teruel I-II-III	Spain	3 300	156.2
5. BOT Elektrownia Belchatow S.A.	Poland	11 892	128.2
6. Megalopoli III	Greece	839	112.4
7. Elektrownia Patnow	Poland	3 624	100.0
8. TPP “Bobov dol”	Bulgaria	1 950	84.5
9. TPP “Brikel”	Bulgaria	1 020	77.4
10. S.C. Complexul Energetic Rovinari S.A. No 2	Romania	1 756	71.3

Table 1. The ten large combustion plants with the highest emissions of sulphur dioxide (average 2004–2006).

NO _x	State	Thermal capacity (MWth)	Annual NO _x emissions (Ktonnes)
1. Drax	United Kingdom	10 800	58.3
2. BOT Elektrownia Belchatow S.A.	Poland	11 892	42.0
3. CT Teruel I-II-III	Spain	3 300	31.1
4. Aberthaw	United Kingdom	4 200	24.5
5. Elektrownia “Kozienice” S.A.	Poland	6 812	22.3
6. Cottham	United Kingdom	5 500	22.0
7. CT Compostilla II (G 3 and 4)	Spain	1 675	21.5
8. Ratcliffe	United Kingdom	5 500	21.5
9. Kingsnorth	United Kingdom	5 500	21.4
10. Loggannet, Scottish Power plc	United Kingdom	6 400	20.4

Table 2. The ten large combustion plants with the highest emissions of nitrogen oxides (average 2004–2006).

be responsible for 80–85 per cent of the total LCP emissions.

Using three-year averages of the data,

Entec listed which Member States had the highest emissions from LCPs. Two countries feature in the top five for all three pollutants, namely Spain and Poland, while

three other countries – Bulgaria, Romania and the United Kingdom – feature in the top five for two pollutants.

The ten plants with the highest average annual SO₂ emissions are spread over five countries: Bulgaria, Spain, Poland, Greece and Romania (see Table 1). The primary fuel type of all these plants is coal, either hard coal or lignite. The total annual SO₂ emissions from these ten plants amount to 1,519 kilotonnes (kt), which represents 30 per cent of the total 5,137 kt from all EU LCPs.

Six out of the ten plants with highest average annual NO_x emissions are located in the United Kingdom. Of the remaining four plants, two are in Poland and two in Spain (see Table 2). All are public electricity generation plants, and they all burn coal. Total annual NO_x emissions from these ten plants combined are 285 kt, which represents 13 per cent of the total 2,156 kt from all LCPs in the EU.

A comparison of the SO₂, NO_x and dust average emission factors for the LCPs in each Member State showed that the highest SO₂ emissions factors occur in

Bulgaria, followed by Romania, Greece, Spain and Cyprus. For NO_x, the highest relative emissions were found in Spain, Romania, Portugal, Slovenia and Bulgaria, and for dust in Bulgaria, Greece, Slovakia, Romania and Estonia.

Plant performance was also compared to the emission limit values (ELVs) of the LCP directive from 2001. Moreover, in a second step actual performance was also compared to the BATAELs – emission levels that indicate what can be achieved if an installation applies the best available techniques (BAT), as indicated in the LCP best available techniques reference documents (BREF) document.

It was found that in 2006 – according to Member States' reports – almost 30 per cent of the plants have operated above the LCP directive's binding emission limit values for SO₂. Approximately 40 per cent operated below the ELVs but above the upper BATAEL range, and a further 20 per cent between the lower and upper ranges. Around one in ten plants have been operating below the lower BATAEL range, i.e. their emissions were actually lower than would be expected if the strictest best available emission control technology were applied.

For NO_x the number of plants that have been operating above the directive's ELVs in 2006 was also around 30 per cent. However, over 50 per cent of plants seem to have been operating between the ELVs and upper BATAEL range and a smaller proportion operated at lower emission levels – approximately 16 per cent between the upper and lower ranges of the BATAELs and about two per cent below the lower range.

In the case of dust, an approximately equal proportion of plants (between 22 and 28 per cent) appear to have been operating in 2006 at each category of performance.

Christer Ågren

Evaluation of the Member States' emission inventories 2004–2006 for LCPs under the LCP Directive (2001/80/EC). Final Report, September 2008. By Entec UK Ltd. Consultancy report to the European Commission, DG Environment.

For more information on the LCP directive, or to download the Entec report, go to:

<http://ec.europa.eu/environment/air/pollutants/stationary/lcp.htm>



WINTER/EWEA

Taking the lead.

Wind now leads EU power sector

In 2008, more wind power was installed in the EU than any other electricity generating technology, according to statistics from the European Wind Energy Association.

Last year, wind power accounted for 43 per cent of all new electricity generating capacity, exceeding all other technologies including gas, coal and nuclear power.

A total of nearly 65,000 MW of installed wind energy capacity was operating in the EU by the end of 2008, 15 per cent more than in 2007. Germany is back in a narrow lead with 1,665 MW against Spain's 1,609 MW.

On average, 20 wind turbines were installed every working day in 2008. By the end of the year, a total of 160,000 workers were employed directly or indirectly in the sector, which saw investments of about €11 billion in the EU.

The wind power capacity installed by end 2008 will, in a normal wind year, produce 142 TWh of electricity, equal to about 4.2 per cent of the EU's electricity demand, and avoid the emission of 108 million tonnes of CO₂ per year, the equivalent of taking more than 50 million cars off the roads.

Source: <http://www.ewea.org/>

The directive on large combustion plants (LCP)

Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants (the LCP directive) was set up to reduce the emissions of sulphur dioxide (SO₂), oxides of nitrogen (NO_x) and particulate matter (PM) from existing and new combustion plants through the introduction of emission limit values (ELVs) for these pollutants. Only plants with a capacity of 50 megawatts thermal input or more are covered by the directive.

ELVs for new plants came into force in 2003, while ELVs for existing plants apply from 1 January 2008. For existing plants, Member States may choose to make use of a national emission reduction plan (NERP), setting overall emission limitations for a defined group of plants, instead of applying the ELVs of the directive to individual plants.

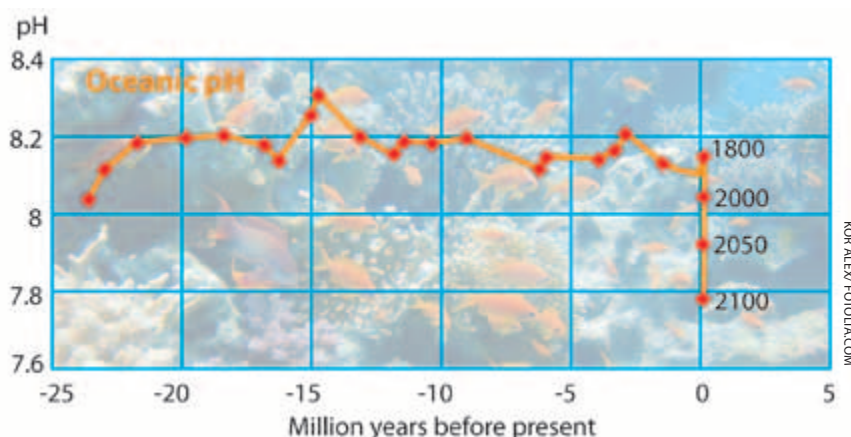
Ocean acidification – the other CO₂ problem

Within decades increasing atmospheric carbon dioxide levels in the atmosphere could severely damage marine ecosystems, scientists warn.

Global warming affects the oceans not only through rising sea level and warmer surface water. As carbon dioxide levels in the atmosphere increase, so does the uptake of carbon dioxide in ocean surface water, which in turn decreases the pH of the water – the oceans become more acid. Ocean acidification has been referred to as “the other CO₂ problem”. Scientists warn that the effects on marine ecosystems may be severe. It could, among other things, make most regions of the oceans inhospitable to coral reefs and lead to changes in commercial fish stocks, threatening food security for millions of people.

The exchange of gases between the atmosphere and the oceans represents major pathways in the global carbon cycle, and the oceans are enormous carbon sinks, holding about 50 times more CO₂ than soils and the terrestrial biosphere. The present net carbon uptake is about 2 Gt (Gigatonnes) annually, which is equivalent to about 30 per cent of anthropogenic emissions. As a result of this, there has already been a demonstrable increase in CO₂ concentrations in the upper layer of the sea over the last few decades. This effect can be traced to a water depth of 1,000 metres.

Past and present variability of marine pH. Future predictions for years shown on the right-hand side of the figure are model-derived values based on IPCC mean scenarios. (From the Eur-Oceans Fact Sheet No. 7, 2007.)



Getting weaker.

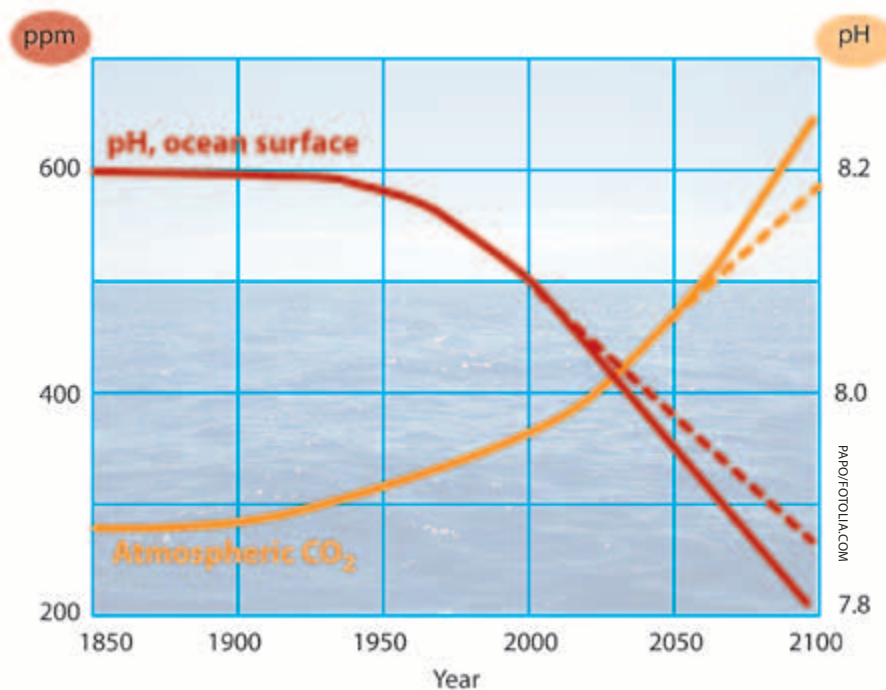
The chemical effect of this increase is measurable. Since the onset of industrialization the pH value of the ocean surface water has dropped by an average of about 0.11 units, which is equivalent to an increase in concentration of hydrogen ions (H⁺) by around 30 per cent. This may

not be alarming in itself, but the rate of change is cause for concern. Available data indicates that the ocean has never experienced such a rapid acidification. By the end of this century, if concentrations of CO₂ continue to rise exponentially, we may expect changes in ocean pH larger than ever before experienced on the planet – at least for the past 20 million years.

Human interference with the chemical balance of the ocean will not remain without consequences for marine ecosystems. Of specific concern is calcification, the process by which many marine organisms build their skeletons or shells, using calcium carbonate extracted from the water. Increasing CO₂ concentrations and falling pH value hamper calcification, causing a weakening of the skeletal structure, or even – below a certain pH level – the dissolution of shells and skeletons. This will of course affect all marine calcifying species, including clams, snails and corals. Starfish and other echinoderms are especially threatened, since their calcite structures dissolve more easily than those of other organisms.

Simulations indicate that with an atmospheric CO₂ concentration of just under 520 ppm (which could be reached as early as the middle of this century), almost all of today’s warm weather coral reef locations will be unsuitable for coral growth because of acidification.

Around three-fourths of the global marine calcium carbonate production is carried out by plankton, among which pteropods and coccolithophores are of specific interest in this context. Coccolithophores are single-celled phytoplankton (i.e. they are “green plants”, serving as primary producers in the food webs) with calcite shells. They play a significant role in the global carbon cycle, since the deposition of coccolithophore shells greatly contrib-



Changes in atmospheric CO₂ under the IPCC “business as usual” scenario (IS92a) to the year 2100 and associated changes in ocean pH and carbon chemistry.

utes to the export of calcium carbonate to the deep sea. Pteropods are important components in marine food webs in polar and subpolar seas.

Ocean acidification will likely make it impossible for these organisms to form shells. In the case of pteropods, for which the Southern Ocean forms an important part of their habitat, this could take place as early as 2050, severely limiting their distribution area.

The effects of acidification on marine plankton may in turn affect the global carbon cycle and the role of the ocean as a carbon sink.

Through the marine food chains, the adverse effect of ocean acidification on calcification could have considerable impact on the total marine biosphere. It cannot be ruled out that pelagic fisheries, and thus the human food supply, may be affected.

In a common declaration (The Monaco Declaration) 150 top marine scientists recently voiced their deep concerns over “recent, rapid changes in ocean chemistry and their potential, within decades, to severely affect marine organisms, food webs, biodiversity and fisheries.”

Policymakers need to realize that ocean acidification is not a peripheral issue, the scientists say. “It is *the other CO₂ problem* that must be grappled with alongside climate change.” The statement calls on

policymakers to stabilise CO₂ emissions “at a safe level to avoid not only dangerous climate change but also dangerous ocean acidification”. An example given in the declaration indicates that halting ocean acidification may demand even further reductions than indicated by the IPCC to keep global warming within limits: “To stay below an atmospheric CO₂ level of about 550 ppm, the current increase in total CO₂ emissions of three per cent per year must be reversed by 2020. Even steeper reductions will be needed to keep most polar waters from becoming corrosive to the shells of key marine species and to maintain favourable conditions for coral growth.”

Roger Olsson

Further reading:

WBGU: The future oceans – Warming Up, Rising High, Turning Sour. Special report 2006: <http://www.wbgdu.de>

BBC news: Acid oceans need urgent action: <http://news.bbc.co.uk/2/hi/science/nature/7860350.stm>

The Ocean Acidification Network: <http://www.ocean-acidification.net>. The Monaco Declaration can be accessed from this site.

Coal-fired power plants big mercury culprits

The fifty most-polluting coal-burning power plants in the United States emitted twenty tons of mercury into the air in 2007. Of the ten highest-emitting plants, all but one reported an increase as compared to 2006.

Coal-fired power plants are the single largest source of mercury air pollution in the U.S., accounting for roughly 40 per cent of all mercury emissions, according to the Environmental Protection Agency.

A new report from the Environmental Integrity Project rates the power plants both in terms of sheer mercury pollution and mercury pollution adjusted per kilowatt hour. It also outlines the ways in which mercury removal is achievable with existing technology.

Activated carbon injection, which is commercially available and has been tested, can achieve mercury reductions of 90 per cent (and better when coupled with a fabric filter for particulate control) on both bituminous and sub-bituminous coals. In addition, mercury can be significantly reduced as a “co-benefit” of controls for other pollutants, such as fabric filters, flue gas desulphurization, and selective catalytic reduction.

Source: The report “**Top 50 Power Plant Mercury Polluters**”. Available at: <http://www.environmentalintegrity.org/pub566.cfm>

EU considers IMO membership

A policy document entitled “Maritime Transport Strategy 2009–2018” presented on 21 January by the European Commission called for EU observer status for the International Maritime Organisation (IMO) and went as far as mentioning the term full membership, though this is not thought to be an immediate goal. Currently, the European Commission, not the EU, has IMO observer status, and the EU 27 Member States are also members of IMO.

The policy document also called for “Greener Maritime Transport”, saying that the EU should encourage all actors to promote green solutions in maritime transport. The Commission, the Member States and the European maritime industry should be working together towards the long-term objective of “zero-waste, zero-emissions”.

Sources: Lloyds List and European Commission, 21 January 2009

Stricter emission limits for trucks and buses

The European Parliament agreed in December to a proposal that emissions of nitrogen oxides from new heavy duty vehicles shall be cut by 80 per cent and those of particulate matter by 66 per cent, as compared to existing standards.

Air quality is still a significant problem throughout the European Union, especially in urban areas and in densely populated regions. Heavy-duty vehicles are responsible for a significant proportion of total pollutant emissions from transport and make a major contribution to air quality problems in European cities.

Emission standards for heavy vehicles have been gradually tightened over time (*see figure*). In December 2007, the European Commission proposed tougher limits on harmful exhaust emissions from heavy vehicles, including ozone precursors such as nitrogen oxides (NOx) and hydrocarbons (HC) as well as fine particles (PM).

During autumn 2008, representatives of Parliament and Council agreed on a

compromise package, which was adopted by the European Parliament on 16 December 2008. The new regulation, the so-called Euro VI emission standards, lays down harmonized technical standards for heavy vehicles (trucks, lorries and buses) over 2,610 kg, which all new vehicles will have to comply with, thus replacing the Euro V limits which have applied since October 2008.

Euro VI will apply from 31 December 2012 for new type approvals and one year later for all new vehicles. To become final, the Euro VI package still has to be adopted by the Member States in Council, which is expected to occur shortly.

The compromise backs the Commission's proposed lower limit values for emissions

of several pollutants (*see table*). The limit value for NOx will be 400 milligrams per kilowatt hour (mg/kWh), which is 80 per cent less than the current Euro V limit value, and the PM limit will be 10 mg/kWh – a 66-per-cent reduction compared with the Euro V limit.

According to the Commission, the new limits will be a step forward towards global harmonisation since the limit values are similar to those of the United States. The US 2010 standards for heavy-duty vehicles are set at 0.2 grams NOx per gram per brake horsepower/hour (g/bhp-hr) and 0.01 PM g/bhp-hr, which equals approximately 270 mg NOx/kWh and 13 mg PM/kWh.

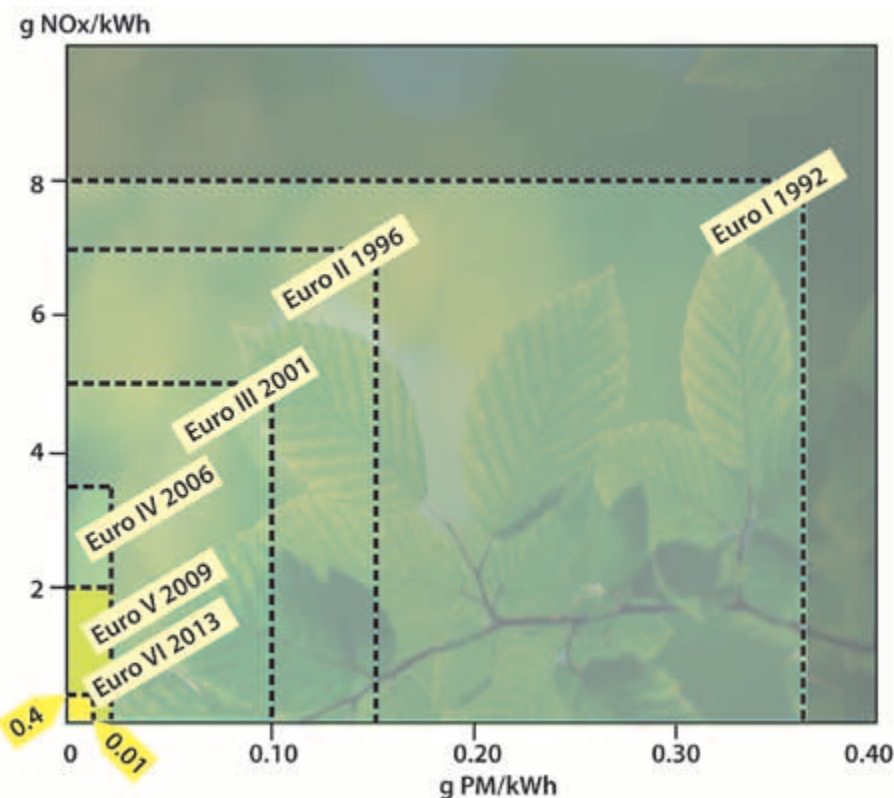
Jos Dings, director of Transport and Environment (T&E) said: "The EU has done the right thing by getting these long-overdue standards agreed. But lorries have a nasty habit of looking a lot cleaner in the testing laboratory than in the real world. Close monitoring will be needed to ensure nitrogen oxides and other harmful emissions really go down."

Emission limits in the proposal are still based on old European test cycle procedures (ESC and ETC). Once correlation factors are developed – but no later than 1 April 2010 – the limits will be replaced with limit values for the new world harmonized testing, the WHSC and WHTC, World Harmonized Stationary Cycle and Transient Cycle, respectively.

Also by 1 April 2010, a particle number standard is to be defined. The particle number limits are "likely to reflect the highest levels of performance currently obtained with particle filters according to the best available technology", says the proposal.

The currently agreed text does not

Figure: Development of European emission limits for NOx and PM from heavy duty vehicles.



Test cycle (and engine type)	Limit values							
	CO (mg/kWh)	THC (mg/kWh)	NMHC (mg/kWh)	CH ₄ (mg/kWh)	NO _x ⁽²⁾ (mg/kWh)	NH ₃ (ppm)	PM mass (mg/kWh)	PM ⁽¹⁾ number (#/kWh)
ESC (CI)	1 500	130			400	10	10	
ETC (CI)	4 000	160			400	10	10	
ETC (PI)	4 000		160	500	400	10	10	
WHSC	To be entered before 1 April 2010							
WHTC	To be entered before 1 April 2010							

Table: Euro VI emission limits for heavy duty vehicles. CO = Carbon monoxide, THC = Total hydrocarbons, NMHC = Non-methane hydrocarbons, NO_x = Nitrogen oxides, NH₃ = Ammonia.

(1) A number standard is to be defined no later than 1 April 2010.

(2) The admissible level of NO₂ component in the NO_x limit value may be defined at a later stage.

introduce a separate emission limit for the nitrogen dioxide (NO₂) component of NO_x. The Commission is asked to, if appropriate, propose such limit at a later, unspecified date.

Finally, the compromise also follows the Commission's proposal to enable Member States to provide for financial incentives to speed up the placing on the market of vehicles meeting the new requirements.

"It is important to encourage the early enforcement of the Euro VI standards to improve urban air quality and the quality

of life of European citizens," said Dragomira Raeva, policy officer at the European Environmental Bureau (EEB). "Member states should back the early introduction of Euro VI vehicles and retrofitting of existing vehicles with financial incentives."

Christer Ågren

For more information, see:

<http://ec.europa.eu/enterprise/automotive/>

Road transport has biggest impact on global warming

A recent scientific study explored the effect on global mean temperature of transport emissions from a single year over different time periods, and found that emissions from road transport have the most impact.

Carbon dioxide (CO₂) is a greenhouse gas (GHG) that remains in the atmosphere for centuries. Thus it has an influence on warming over relatively long time scales compared to some other GHGs, such as methane or ozone. High levels of CO₂ emitted as a result of fuel consumption mean that road transport makes the largest contribution to global temperature increases when 20 to 100 year timescales are considered.

In contrast, aviation has a large impact

over a 10-year timescale because most of its effects result from short-lived gases, such as ozone, and induced cirrus clouds. However, current high SO₂ and NO_x emissions from shipping cause a cooling effect during the first 40 years, but on longer timescales CO₂ emissions from shipping cause a net warming effect. It should be noted that SO₂ and NO_x have other negative environmental impacts, such as damage to health, acidification and eutrophication.

Source: Berntsen, T. and Fuglestad, J. (2008).

Global temperature responses to current emissions from the transport sectors. Proceedings of the National Academy of Sciences. 105(49): 19154-19159.

Soot reduction may help slow global warming

A recent study by the US space agency NASA shows that cutting emissions of soot can have an immediate cooling effect – and prevent hundreds of thousands of deaths from air pollution at the same time.

Emission reductions have a virtually instantaneous effect, because soot rapidly falls out of the atmosphere, unlike carbon dioxide, which remains there for over a hundred years. And because soot is one of the worst killers of all pollutants, radical reductions save lives and so should command popular and political support.



Soot reduction - sort of...

The study – from NASA's Goddard Institute for Space Studies, and published in the journal *Atmospheric Chemistry and Physics* – concludes that tackling the pollution provides "substantial benefits for air quality while simultaneously contributing to climate change mitigation" and "may present a unique opportunity to engage parties and nations not yet fully committed to climate change mitigation for its own sake."

Soot contains up to 40 different cancer-causing chemicals and can also cause respiratory and heart diseases. It is estimated to cause two million deaths in the developing world each year – mainly among children – when emitted from wood-burning stoves in poorly ventilated houses.

Tackling these two health crises, the NASA study concludes, would also be the most effective short-term way of slowing climate change. Its research shows that the strongest leverage on reducing global warming would be achieved by reducing emissions from domestic fuel burning in developing countries, particularly in Asia, and by a reduction in transport emissions in North America, especially from diesel engines.

Source: Article by G. Lean, published 4 January 2009 in The Independent, UK.

Greece and Spain still defaulting

Greece and Spain have still not reduced their emissions as required by the protocols to the Convention on Long Range Air Pollution

A few countries are still failing to comply with the emission reduction demands of protocols to the Convention on Long-Range Transboundary Air Pollution, and several countries are failing to comply with the obligation to report. This is apparent from last year's review conducted by its Implementation Committee¹, which was discussed at the convention's Executive Body (EB) meeting in December 2008.

Despite the sharp reprimands that were issued in 2006 and 2007 by the convention's EB (which includes representatives from all the member countries), Greece and Spain have still not reduced their emissions as required by the protocols².

Greek NO_x emissions are still higher than they were in 1987, the base year for the 1988 NO_x protocol. Greece expressed expectations to achieve compliance by 2010, but the Implementation Committee was not convinced this would actually happen, and concluded that the country's responses to earlier EB decisions remained insufficient.

As regards nitrogen oxides (NO_x), Spain has been in non-compliance for 14 years now, i.e. every year since 1994.

There are other things in life than reducing air pollution.



There are other things in life than reducing air pollution.

Spain also failed to comply with the VOC protocol – it is still a long way from achieving the required 30-per-cent reduction. Spain has stated that it did not expect to achieve compliance with the NO_x protocol before 2017 and with the VOC protocol before 2020.

The EB expressed increasing disappointment at the continuing failure of Spain and Greece to fulfil their obligations to take effective measures to attain compliance, and strongly urged both countries to implement the measures necessary to achieve compliance as soon as possible.

In addition, increased use of biomass for domestic heating has meant that emissions in Denmark of polycyclic aromatic

hydrocarbons (PAH) continue to increase, which is not compliant with the emission reduction obligation in the Persistent Organic Pollutant (POP) protocol.

The EB expressed disappointment that Denmark has once again indicated that it will not achieve compliance for many years, and urged Denmark to speed up the implementation of planned measures and/or take additional measures as soon as possible to shorten the period of expected non-compliance.

As to the requirements to report on emission data and on strategies and policies for abating air pollution generally, the committee noted that despite a general improvement, several parties were still found to be failing to comply with their reporting obligations.

Christer Ågren

¹ The eleventh report of the CLRTAP Implementation Committee (EB.AIR/2008/3). Can be downloaded from: <http://www.unece.org/env/lrtap/>

² Under the 1988 NO_x Protocol, countries agreed to restrict their NO_x emissions to 1987 levels after 1994. The obligation under the 1991 VOC Protocol is for most countries to reduce their VOC emissions by 30 per cent by 1999, as compared to a base year, which in most cases is 1988.



Baltic Sea - first nitrogen emissions control area?

The Baltic Sea is already an emission control area (ECA) for sulphur dioxide. Now HELCOM intends to take the same step for nitrogen oxides.

At a meeting in St. Petersburg on 18–20 November, the Baltic Marine Environment Protection Commission (HELCOM) agreed, in principle, to submit to the International Maritime Organisation (IMO) a proposal to designate the Baltic Sea as a nitrogen oxides emission control area (NOx-ECA) under the revised Annex VI of the IMO's MARPOL Convention.

"Tighter NOx-ECA restrictions, requiring an 80-per-cent reduction of emissions from new marine diesel engines installed on ships as from 1 January 2016, would reverse the increasing trend of NOx emissions in the Baltic Sea in the long run," said HELCOM's professional secretary Monika Stankiewicz.

The HELCOM countries are planning to make this submission in 2010.

Atmospheric nitrogen deposition is one of the main contributors to the high nutrient concentrations that stimulate massive algae blooms in the Baltic Sea. Shipping has been identified as the largest contributor to atmospheric nitrogen oxide deposition in the Baltic Sea with a share of 16 per cent. However, the contribution

can reach up to 50 per cent in some areas and seasons.

The total NOx emission from ships in the Baltic Sea is estimated at more than 370 kilotonnes in 2006 and 400 kilotonnes in 2007. This means they are comparable to the land-based emissions from Denmark and Sweden combined.

The Baltic Sea was the first sea area to be designated as a sulphur oxides emission control area (SOx-ECA) in 1997, but as a result of slow ratification, the enforcement of this decision was postponed until 19 May 2006.

Source: HELCOM press release 24 November 2008. http://www.helcom.fi/press_office/news_helcom/en_GB/MARTIME_7_outcome/

Note: The Helsinki Commission (HELCOM), officially known as the Baltic Marine Environment Protection Commission, is an intergovernmental organisation of the nine Baltic Sea coastal countries – Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, and Sweden – and the EU that works to protect the marine environment of the Baltic Sea from all sources of pollution and to ensure safety of navigation in the region.

Global wind energy growing fast

Figures released by the Global Wind Energy Council show that the United States overtook Germany to become world leader in wind power installations, and China's total capacity doubled for the fourth year in a row. Total worldwide installations in 2008 were more than 27,000 MW, dominated by the three main markets in Europe, North America and Asia.

Global wind energy capacity grew by 28.8 per cent last year, even higher than the average over the past decade, to reach total global installations of more than 120.8 GW at the end of 2008. Over 27 GW of new wind power generation capacity came online in 2008, 36 per cent more than in 2007.

Source: <http://www.gwec.net/>

Danish co-operation to cut ship emissions

On 12 November 2008, Denmark's environment ministry announced a partnership with the Danish Shipowners' Association aimed at further reducing air pollutant emissions from ships. The initiative comes in response to new standards confirmed by the International Maritime Organisation (IMO) in October. A first action plan should be ready by February 2009.

Source: The Danish Ministry of Environment. See: http://www.mim.dk/Nyheder/Pressemeddelelser/PM_skibsfart.htm

Recent publications

EEA Signals 2009, key environmental issues facing Europe

Signals is published by the European Environment Agency (EEA) at the start of each year and provides snapshot stories on issues of interest both to the environmental policy debate and the wider public for the upcoming year.

Published by EEA, January 2009. Available at <http://www.eea.europa.eu/publications/signals-2009>

Maximising the environmental benefits of Europe's bioenergy potential

Report assessing the environmental impacts of various ways of converting the technical bioenergy potential into electricity, heat and biofuels.

Published by European Environment Agency (EEA), November 2008. EEA Technical report No 10/2008, available at http://reports.eea.europa.eu/technical_report_2008_10/

Beyond transport policy - exploring and managing the external drivers of transport demand

Report presenting an analysis of three examples of relations between societal activities and transport demand – effects of food production and consumption on shopping journeys and freight traffic; increasing use of air travel for business and leisure; effects of education based travel on transport demand.

Published by European Environment Agency (EEA), December 2008. EEA Technical report No 12/2008, available at http://reports.eea.europa.eu/technical_report_2008_12/

Climate Change and Aviation: Issues, Challenges and Solutions

Edited by S Gössling and P Upham. Provides a comprehensive review of the topic, bringing together an international team of leading scientists. Starting with the science of the environmental issues, it moves on to cover drivers and trends of growth, socio-economics and politics, as well as mitigation options, the result being a broad yet detailed examination of the field.

Published by Earthscan Ltd, February 2009. 368 pp. ISBN 9781844076208. Further information: www.earthscan.co.uk

Recent publications from the Secretariat



Last Gasp of the Coal Industry

By Gabriela von Goerne and Fredrik Lundberg, October 2008.

By employing carbon capture and storage (CCS) we can continue to use fossil fuels and at the same time greatly reduce carbon dioxide emissions. This frequently painted picture sounds almost too good to be true, and that is probably the case.

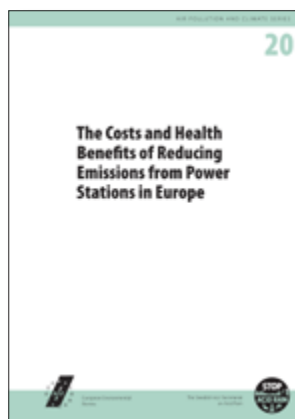
This report takes a look behind the bright vision of CCS given by proponents of this technology. It is not intended to damn CCS but is an appeal for wise decision-making.



Carbon Capture and Storage in Norway

By Tore Braend, October 2008. Strong economic and political motives, combined with a partly positive and partly silent NGO community, has contributed strongly to the present powerful commitment towards the use of CCS in Norway.

The overall effect of this commitment has been a negative impact on efforts to reduce emissions of greenhouse gases in other sectors, especially the transport sector, where emissions are growing fastest.



The Costs and Health Benefits of Reducing Emissions from Power Stations in Europe

By Mark Barrett, UCL, and Mike Holland, EMRC, April 2008.

According to this study, application of advanced emission control technologies to the 100 most polluting plants in the EU27 would cut total EU27 emissions of SO₂ by approximately 40 per cent and emissions of NO_x by 10 per cent. The average benefit-to-cost ratio for measures at the 100 most polluting plants in Europe is 3.4, i.e. the estimated health benefits are 3.4 times bigger than the estimated emission control costs.

How to order

Single copies of the above mentioned material can be obtained from the Secretariat (free of charge within Europe). Please call for quotation if more copies are required. Reports can also be downloaded in pdf format from www.airclim.org

Same, same but different...

Since 1 October 2008 the Swedish NGO Secretariat on Acid Rain has a new name.

From now on we are the **Air Pollution & Climate Secretariat**.

Please note our new web address, www.airclim.org, and new mail addresses: info@airclim.org, christer.agren@airclim.org, reinhold.pape@airclim.org, acidnews@airclim.org; all followed by @airclim.org

Coming events

For the latest news and direct links, please visit www.airclim.org

Green Ship Technology 2009. Hamburg, Germany, 24-25 March 2009. Information: www.greenship-technology.com/mte/gst09/

7th International Conference on Air Quality - Science and Application (Air Quality 2009). Istanbul, Turkey, 24-27 March 2009. Information: www.airqualityconference.org

UN FCCC First preparatory session for Copenhagen. Bonn, Germany, 29 March - 8 April 2009. Information: www.unfccc.int

Sustainable Bioenergy 2009. London, UK, 1-2 April 2009. Info: www.environmental-finance.com

4th International conference on Future Urban Transport. Goteborg, Sweden, 19-21 April 2009. Information: www.fut.se

CLRTAP Working Group on Strategies and Review. Geneva, Switzerland, 20-24 April 2009. Information: www.unece.org/env/lrtap/

Reducing emissions to air from shipping. London, UK, 22-24 April 2009. Information: www.lloydsmarineacademy.com/lw1068

Health Effects Institute's 2009 Annual Conference. Portland, Oregon, 3-5 May 2009. Information: www.healtheffects.org

13th European Conference on Mobility Management (ECOMM). San Sebastian/Donostia, Spain, 13-15 May 2009. Information: www.ecomm2009.eu

Nitrogen deposition and Natura 2000. Workshop on science & practice in determining environmental impacts. Brussels, Belgium, 18-20 May 2009. Information: www.cost729.org

Ultrafine Particles - Sources, Effects, Risks, Mitigation Strategies. Brussels, Belgium, 19-20 May 2009. Information: <http://efca.net/>

International Transport Forum: "Transport and Globalization". Leipzig, Germany, 27-29 May 2009. Information: www.internationaltransportforum.org

Synbios III - third international conference on biofuels, batteries and hybrid solutions for vehicles. Gothenburg, Sweden, 28-29 May 2009. Information: www.synbios.se

UN FCCC Second preparatory session for Copenhagen SB 30. Bonn, Germany, 1-12 June 2009. Information: www.unfccc.int

EU Environment Council. Luxembourg, 25 June 2009.

17th European Biomass Conference & Exhibition. Hamburg, Germany, 29 June - 3 July 2009. Information: www.conference-biomass.com

IMO Marine Environment Protection Committee 59. London, UK, 13-17 July 2009. Information: www.imo.org