NO. 3, OCTOBER 2012

Acid News

China: New standards for power plants

China's new emission standards for power plants are comparable to, and in some cases even stricter than, current standards in the EU and the United States.

► Page 3

Slow steaming saves money and the climate

Regulated speed reduction is a cost-effective and practical way to reduce greenhouse gas emissions and air pollution from shipping.

► Page 8

Climate policy for the agricultural sector

A trading system for agricultural greenhouse gas emissions results in less leakage than emission caps or a tax on livestock, according to a new report.

► Page 12

Opinion: Ten one-liners for air policy

In politics, one-liners are in vogue because they bring the message back to the core. The same seems to apply to air pollution policy.

► Page 14

F-gases still a problem

The production of fluorinated GHGs in the EU has decreased in terms of tonnage, but there is no reduction in the overall climate impact.

► Page 17

New CO_2 standards for cars and vans

Carbon dioxide standards have pushed the auto industry to achieve the same efficiency improvements in the last three years as achieved in the previous eight years.

► Page 18

Progress in EU air policy review

Next year the Commission is to present an updated EU clean air strategy. Scenarios for future air pollutant emissions indicate that these can be significantly cut by combining technical abatement measures with stricter climate policies.

Preparatory work on the review and revision of EU air pollution policy is ongoing, and on 21 June a Stakeholder Expert Group (SEG) met in Brussels to be updated on progress and to discuss the information developed so far. The review process started in March last year with a report from the Commission (see AN 2/11, pp 4–5) and two previous stakeholder meetings have been held in June 2011 and January 2012.

The process is expected to result in a clean air strategy package that is to be presented by the Commission in autumn 2013 – a year that has been announced by Environment Commissioner Janez Potočnik as the EU Year of Air.

Page 4 ►

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 fulfil 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:

Air Pollution & Climate Secretariat
Box 7005, 402 31 Göteborg, Sweden
Tel: +46 31 711 45 15
Fax: +46 31 711 46 20
E-mail: *info@airclim.org*
Internet: *www.airclim.org*

Editor: Kajsa Lindqvist
Assistant editors: Christer Ågren

Printed by Trydells Tryckeri, Laholm, Sweden.
ISSN 0281-5087.

The Air Pollution and Climate Secretariat
The Secretariat has a board consisting of one representative from each of the following organisations: Friends of the Earth Sweden, Nature and Youth Sweden, the Swedish Society for Nature Conservation, and the World Wide Fund for Nature (WWF) Sweden.

The essential aim of the Secretariat is to promote awareness of the problems associated with air pollution and climate change, and thus, in part as a result of public pressure, to bring about the needed reductions in the emissions of air pollutants and greenhouse gases. The aim is to have those emissions eventually brought down to levels that man and 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 organisations, 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 organisations 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

AirClim

Today it goes without saying that countries have to cooperate and take action in order to resolve transboundary environmental problems, but this was far from obvious for most countries only a few decades ago.

Let's go back just forty years, to 1972, when the first ever global meeting on environmental matters, the United Nations Conference on the Human Environment, took place in Stockholm. Sweden, being the host country, presented a case study showing that air pollutants carried by winds from other countries were the main cause of freshwater acidification in Scandinavia.

Acid News celebrates 30 years!

The Swedish study aroused both attention and disbelief – additional research and studies were needed to convince big emitter countries that their emissions actually resulted in environmental damage in other countries hundreds and even thousands of kilometres away.

After several years of preparatory work and – sometimes intensive – discussions, in 1979 countries in Europe and North America eventually agreed and signed the Convention on Long-Range Transboundary Air Pollution (CLRTAP), which now covers a wide range of air pollutants.

Some environmental groups became aware of the transboundary dimensions of the air pollution problems as early as the 1970s, and carried out international activities. More followed in the early 1980s, as air pollution was seen to kill not only fish but also forests.

To improve general awareness and initiate international coordination of environmental activities, a group of Swedish environmentalist associations organised an international acid rain conference in 1981. One outcome of this conference was the formation of the Swedish NGO Secretariat on Acid Rain in January 1982 – later renamed the Air Pollution and Climate Secretariat (AirClim). 1982 was also the year Acid News was born, which means it now celebrates its 30th birthday!

Since their peak around 1980, emissions of acidifying air pollutants in Europe have come down significantly (see article on p. 20), and in some areas ecosystems are slowly recovering. Tougher emission controls on industry and road vehicles have resulted in less polluting power plants and cars. In addition, stricter environmental legislation has helped to speed up structural changes in the energy and transport sector and improved energy efficiency.

While the air we breathe has become a little bit cleaner, it is still unhealthy or even deadly. A study by the European Environment Agency has estimated that pollution by fine particulate matter ($PM_{2.5}$) alone causes close to half a million premature deaths each year in the EU.

Next year the European Commission has promised to deliver a new Thematic Strategy on Air Pollution, to be accompanied by concrete legislative proposals and other initiatives to further cut air pollutant emissions (see article on front page).

Practical application of new and improved emission control techniques must be part of the solution, but minimising the use of fossil fuels is key to resolving both climate change and air pollution as it cuts emissions of the main greenhouse gas CO_2 as well as those of health-damaging sulphur dioxide, nitrogen oxides, fine particulate matter and mercury.

A variety of measures could bring about simultaneous reductions of CO_2 and traditional air pollutants, including energy efficiency, structural change (e.g. fuel switching from coal, diesel and petrol to renewables), and behavioural change (e.g. reducing car usage).

When elaborating the new Thematic Strategy on Air Pollution and setting new ambition levels for air pollution cuts for the next 10-20 years, the Commission must make sure to fully account for these interactions.

Not only will the implementation of tough climate policies help to achieve air quality targets. The significant co-benefits from air pollution reductions also help to motivate a much higher level of ambition for EU's climate policy, as well as a higher share of domestic (i.e. within the EU) carbon dioxide reductions.

Christer Ågren

New emission standards for power plants

China's new emission standards for power plants are comparable to, and in some cases even stricter than, current standards in the EU and the United States.

DBGG1979/FLICKR.COM/ CC BY

As of 1 January 2012, newly constructed power plants in China must achieve tougher emission standards for sulphur dioxide (SO_2), nitrogen oxides (NOx) and particulate matter (PM). For existing power plants, the new standards will take effect as from 1 July 2014. Moreover, starting in 2015, all power plants (new and existing) will be subject to mercury emission standards.

The new Chinese emission standards for air pollutants from thermal power plants were adopted by China's Ministry of Environmental Protection (MEP) in July 2011, and they replace standards that had been in effect since 2003.

According to the International Energy Agency (IEA), the very high – and continuously increasing – burning of coal for power generation in China has caused severe air pollution problems. Levels of air pollutants are high in cities throughout the country, with 90 per cent of those assessed as failing to meet the health-based air quality recommendations by the World Health Organization. There are also acid rain problems across large regions of southern China.

The new emission standards are differentiated by fuel type, and plants using gas or oil have standards at least as strict as those for coal-fired plants.

Specifically for coal-fired power plants, China's new standards are generally stricter than the binding minimum standards currently in place in the EU, both for new and existing plants. In many cases they are also stricter than the standards in the United States. A comparison of emission standards has been published by the World Resource Institute (WRI), and is summarised in the table.

In addition, nine key regions in China with the most severe air pollution problems will face even stricter emission standards than those set out in the table. In these regions all existing and new coal-fired power plants will have to achieve emission limit values for SO_2, NOx and PM of 50, 100 and 20 milligrams per cubic metre (mg/m^3), respectively.

It has been reported that China has raised electricity prices for industrial users in order to pay for the investments needed for air pollution abatement. WRI concludes that this increase in the price of coal-fired power is expected to encourage energy efficiency and improve the competitiveness of renewable sources of energy.

Coal combustion is currently responsible for close to half of the global anthropogenic emissions of mercury into the air, and cutting these emissions is a matter of urgency.

The Chinese emission limit value of 30 micrograms of mercury per cubic metre ($\mu g/m^3$) is a first step in this direction. As this emission level is likely to be met as a result of applying emission control technologies needed anyway to meet the standards for SO_2, NOx and PM, it is not expected to give rise to any significant extra costs.

For comparison, the emission standards of the new Mercury Air Toxics Rule (MATS) in the United States were set on the basis that by 2016 all plants shall achieve a mercury emission performance in line with the 12 per cent best performing plants in the country. This rule is however currently in the process of review by the US Environmental Protection Agency (EPA) and a final decision by the EPA is expected by March 2013.

By contrast, the EU currently has no legislation setting binding mercury emission limit values for large combustion plants. But it may consider introducing mercury control as a result of the ongoing review of the BAT (best available technique) reference documents for large combustion plants under the Industrial Emissions directive.

Christer Ågren

Table: Air pollutant emission standards for coal-fired power plants in China, European Union and the United States (mg/m^3)

		China	EU	US
SO_2	New	100	200	160
	Existing	200/400[1]	400	160/640[3]
NOx	New	100	500/200[2]	117
	Existing	100/200[4]	500/200[2]	117/160/640[5]
PM	New & existing	30	50	22.5
Mercury	New	0.03	-	0.001
	Existing	0.03	-	0.002

1) 400 for four provinces with high-sulphur coal
2) 500 until end 2015; 200 as from 2016
3) 160 for plants built 1997-2005; 640 for plants built 1978-1996
4) 100 for plants built 2004-2011; 200 for plants built before 2004
5) 117 for plants built after 2005; 160 for plants built 1997-2005; 640 for plants built 1978-1996
Source: WRI (2012)

Source: **China adopts world-class pollutant emission standards for coal power plants** (June 2012). World Resources Institute. *www.chinaFAQs.org*

Progress in EU air policy review

Continued from front page

A main component of the package will be a revised Thematic Strategy on Air Pollution (TSAP), updating the previous one from 2005, establishing new targets for reducing damage to health and the environment from air pollution as well as associated ambition levels for future cuts in air pollutant emissions.

The TSAP is expected to be accompanied by a proposal to revise the 2001 National Emission Ceilings (NEC) directive, setting binding emission reduction targets for each member state for five air pollutants: sulphur dioxide, nitrogen oxides, volatile organic compounds, ammonia and particulate matter. The target year for achieving the reductions is yet to be decided, but it is likely to be 2020, 2025 or 2030, or possibly there could be more than one target year.

Originally it was expected that the Commission would also propose to revise the air quality standards under the 2008 air quality directive, but in view of all the ongoing infringement proceedings against member states failing to comply with the current standards for PM_{10} and NO_2, there appears to be some hesitation from the Commission on whether such a revision should be proposed as soon as next year.

In order to achieve the needed emission reductions, a series of sector-related initiatives are being considered and investigated, including:

- Domestic combustion – emission standards for solid-fuel boilers and stoves
- Smaller industrial combustion installations, i.e. those with a rated thermal input of 1–50 megawatts
- Road vehicles – possible introduction of stricter Euro standards;
- Non-road mobile machinery;
- Agriculture, with the focus on measures to cut ammonia emissions;
- International shipping, e.g. expanding the sulphur emission control areas (SECAs) and designating nitrogen emission control areas (NECAs).

For some of these sectors, preparatory work for new or revised legislation is already ongoing. One example is domestic combustion where emission standards and energy efficiency requirements for new solid-fuel boilers will be proposed under the Eco-design directive. Another example is non-road mobile machinery, where a revision of the directive setting emission standards is already long overdue.

A major component of the review process is the emission scenario analysis, which is carried out by the International Institute for Applied Systems Analysis (IIASA). IIASA presented a new baseline scenario[1] showing projected emissions for 2020, 2030 and 2050 based on the most recent expectations for economic development and implementation of EU policies on energy, transport, agriculture and climate change.

The baseline projection for air pollutant emissions should in principle also include the effects of full implementation of all existing national and EU-wide legislation and measures. But there are some relevant pieces of legislation where the impacts on future activity levels cannot currently be quantified and these are therefore not accounted for. This includes measures that may be required to comply with EU air quality limit values for particles (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2) as well as measures needed under the 1991 Nitrates directive to protect water quality.

In spite of a foreseen 40 per cent increase in economic activity between 2010 and 2030, as a result of structural changes in

Emission standards for smaller combustion plants investigated

An EU consultancy study for the European Commission's environment department concludes that the health benefits of controlling air pollutant emissions from small combustion plants would outweigh the costs.

Various options to control emissions from combustion plants with a thermal capacity of between 1 and 50 megawatts (MW) were analysed in the study. These smaller plants are currently not regulated under the 2010 Industrial Emissions Directive (IED), in which the lower capacity limit is set at 50 MW, but a review clause (Article 73) in the directive requires the Commission to investigate the need to control emissions from these plants.

Three main control options were considered and compared with a baseline that assumed no new measures:

- Include these smaller plants in the IED and set minimum emission limit values (ELVs) based on the most stringent national limits applied by member states.
- Include these smaller plants in the IED and set minimum ELVs based on the current IED standards for larger plants (50–100 MW).
- Set minimum ELVs as in the first option, but not requiring a full IED permitting regime.

In the analysis, plants were separated into three size classes (1–5 MW, 5–20 MW and 20–50 MW). Cost estimates included compliance costs (i.e. costs for installing and operating emission abatement techniques) as well as administrative costs associated with permitting.

For all three size classes and all three options the average health benefits from air pollution reductions outweighed the average costs. The highest benefit-cost ratio was found for the largest capacity class (20–50 MW), while the medium capacity class (5–20 MW) showed the highest net benefits.

The possibility of having an alternative regulation of the very small plants up to 5 MW – i.e. not including them in the IED – appears to be considered by the Commission. One idea could be to regulate their emissions through product standards similar to those adopted under the Eco-design directive, but these standards would then apply only to newly built plants.

A draft version of the consultancy study can be downloaded at: http://bit.ly/RyQ8eL

the energy and transport sectors and the progressive implementation of emission control legislation, between 2005 and 2030 the emissions of the main air pollutants sulphur dioxide (SO_2), nitrogen oxides (NOx), volatile organic compounds (VOCs), and particulate matter ($PM_{2.5}$) are expected to drop by 73, 66, 39 and 38 per cent respectively, while those of ammonia are expected to increase by 2 per cent.

On top of the baseline scenario, three other scenarios were investigated:

- Maximum technically feasible reductions (MTFR), which assume a gradual phase-in of currently available emission abatement techniques;
- Decarbonisation (DECARB), which is based on the "Roadmap to 2050" energy scenario and assumes an 80 per cent cut in EU greenhouse gas emissions between 1990 and 2050
- Maximum control efforts (MCE), which use the same energy scenario as DECARB and in addition the application of MTFR (including premature scrapping) and a "healthy diet" scenario that has some impacts on agricultural meat production.

Table: Emissions of air pollutants in EU-27 in 2005 and projections for 2020, 2030 and 2050 under four different scenarios (kilotonnes).

	SO_2	NOx	VOCs	NH_3	$PM_{2.5}$
2005	8133	11501	9535	3873	1833
2020 BASE	2572 (-68%)	5903 (-49%)	6250 (-34%)	3879 (0%)	1299 (-29%)
2020 DECARB	2435 (-70%)	5733 (-50%)	6070 (-36%)	3865 (0%)	1193 (-35%)
2020 MTFR	1655 (-80%)	4862 (-58%)	4091 (-57%)	2631 (-32%)	759 (-59%)
2030 BASE	2224 (-73%)	4435 (-61%)	5797 (-39%)	3943 (+2%)	1145 (-38%)
2030 DECARB	1852 (-77%)	4084 (-64%)	5539 (-42%)	3920 (+1%)	1016 (-45%)
2030 MTFR	1402 (-83%)	2937 (-74%)	3726 (-61%)	2674 (-31%)	580 (-68%)
2030 MCE	1156 (-86%)	2617 (-77%)	3289 (-65%)	2302 (-41%)	480 (-74%)
2050 BASE	1939 (-76%)	4043 (-65%)	5617 (-41%)	3910 (+1%)	1065 (-42%)
2050 DECARB	1106 (-86%)	2672 (-77%)	5193 (-46%)	3867 (0%)	987 (-46%)
2050 MTFR	1165 (-86%)	2329 (-80%)	3587 (-62%)	2672 (-31%)	522 (-72%)
2050 MCE	708 (-91%)	1646 (-86%)	2822 (-70%)	2246 (-42%)	426 (-77%)

BASE: Baseline - reflects current legislation and policy.
DECARB: Decarbonisation - assumes an 80% cut in EU GHG emissions between by 2050.
MTFR: Maximum technically feasible reductions - a gradual phase-in of currently available emission abatement techniques.
MCE: Maximum control efforts - same energy scenario as DECARB plus application of MTFR (including premature scrapping) and less meat consumption

The impact on emissions of the various scenarios is shown in the table. Note that these scenarios and the resulting emission figures are still preliminary – they will be further developed and refined this autumn after in-depth consultations with the member states.

After this refinement, the next step for IIASA is to apply the optimisation mode in its GAINS computer model to identify the least-cost set of emission reduction measures for the EU as a whole that will achieve given environmental targets at differing levels of ambition. Together with an analysis of the associated costs and monetised benefits, this scenario analysis will next year be used to establish the level of ambition for the EU air quality policy for future target years.

As shown by the DECARB and MCE scenarions, policies and strategies for greenhouse gas (GHG) reductions have a big impact on both the overall level of energy use and the use of fossil fuels in particular and thus also on air pollutant emissions. Consequently, climate policies will have a significant impact on the costs of air pollution control.

IIASA has estimated that total air pollution control costs in the EU will increase from the current 0.5 per cent of GDP to 0.6 per cent by 2020, but after 2020 the costs in relation to GDP will under the baseline scenario gradually decline to 0.4 per cent by 2050. Under the DECARB scenario, however, by 2050 both the air pollution control costs and the emissions would be up to 20 per cent lower as compared to the baseline.

In addition to the scenario analysis, participants at the June SEG meeting were informed about work on a number of sector-related issues, including road vehicles, non-road mobile machinery, domestic solid-fuel combustion, agriculture and international shipping. There were also presentations[2] on air quality modelling and monitoring, health impacts and research findings.

Regarding domestic solid-fuel combustion, these boilers and stoves released 616,000 tonnes of $PM_{2.5}$ in 2005, more than one third of the total EU emissions. An EU-wide adoption of the draft forthcoming Eco-design emission standards could according to IIASA's calculations reduce these emissions by 70 per cent in 2030, compared with a 40 per cent reduction under business as usual.

Note that measures under the Eco-design directive would impact only new boilers and stoves sold after 2016. More concerted action under the MCE scenario that assumes the application of best available technology (BAT) to all these sources irrespective of their age, could cut emissions by more than 90 per cent. So far only a few member states, such as Germany, have introduced legislation to cut emissions from domestic wood-burning.

In a separate study, environmental consultancy VITO is investigating possible measures to reduce the emissions from international shipping, such as additional emission control areas (ECAs) for SO_2 and NOx, emission limit values for PM, and ship speed limits. Results from this study are expected later this year.

The Commission announced that it intends to hold a public consultation on policy options towards the end of this year and that the fourth Stakeholder Expert Group meeting is scheduled to take place in early December.

Christer Ågren

1 The IIASA reports prepared for the EU air pollution policy review can be downloaded from: *http://bit.ly/OIsHt6*

2 The presentations held at the 21 June SEG meeting are available at: *http://bit.ly/Uh2KYl*

Great benefits of NOx reductions in the North Sea

The health benefits of establishing a North Sea NECA are up to seven times higher than the costs and would provide total annual net benefits to society of up to €1646 million in 2030.

The costs and benefits of creating a nitrogen emission control area (NECA) in the North Sea and the English Channel have been analysed in two recent studies. Establishing such a control area would mean that ships built from 2016 onwards are required to emit 75 per cent less nitrogen oxides (NOx), resulting in substantial benefits for health and nature.

Annex VI of the MARPOL Convention of the International Maritime Organization (IMO) provides an opportunity for countries to apply for designation of emission control areas (ECAs). The Baltic Sea and the North Sea (including the English Channel) have already been designated for several years as sulphur emission control areas (SECAs), and since August 2011 the North American coastal sea area (extending 200 nautical miles from the shore) has been a combined sulphur and nitrogen ECA.

At a meeting of the Helcom Commission in early March this year, the countries surrounding the Baltic Sea finalised their application to the IMO for making the Baltic Sea a NECA, but they have yet to agree on when to actually submit their application.

Reducing NOx emissions from ships in the North Sea would bring substantial benefits to both public health and the environment. This is the main conclusion from the two new studies by the Netherlands Environmental Assessment Agency and the Danish Environmental Protection Agency, both jointly commissioned by the eight countries bordering the North Sea, that have analysed the costs and benefits of creating a NECA in the North Sea and the English Channel, from 2016 onwards. Both studies looked at the situation in 2030 and how this would differ with or without a NECA.

The North Sea is one of the busiest seas in the world, with more than 20,000 ships registered as operating there in 2009. According to the new studies, emissions of NOx from these ships were estimated to amount to 472,000 tons that same year. It should be noted, however, that some other emission inventories for that same sea area have resulted in significantly higher figures of between 650,000 and 785,000 tons of NOx.

Of the total ship emissions in the North Sea, an estimated 97 per cent are released within 100 nautical miles (185 kilometres) from the shore and 32 per cent within 12 nautical miles.

A baseline scenario for estimating North Sea shipping in 2030 was constructed in which ship activities are expected to continue to grow at annual growth rates of 3.5 per cent for container ships and 1.5 per cent for other types of ship, resulting in a 54 per cent increase in ton-kilometres between 2009 and 2030. It was further assumed that ship transport efficiency will improve by 1 per cent per year on average, that new ships (those built after 2010) will comply with the global IMO Tier II emission standards, and that some of the newly built ships will use liquified natural gas (LNG) as their main fuel.

Under this baseline scenario, NOx emissions in 2030 would come down by

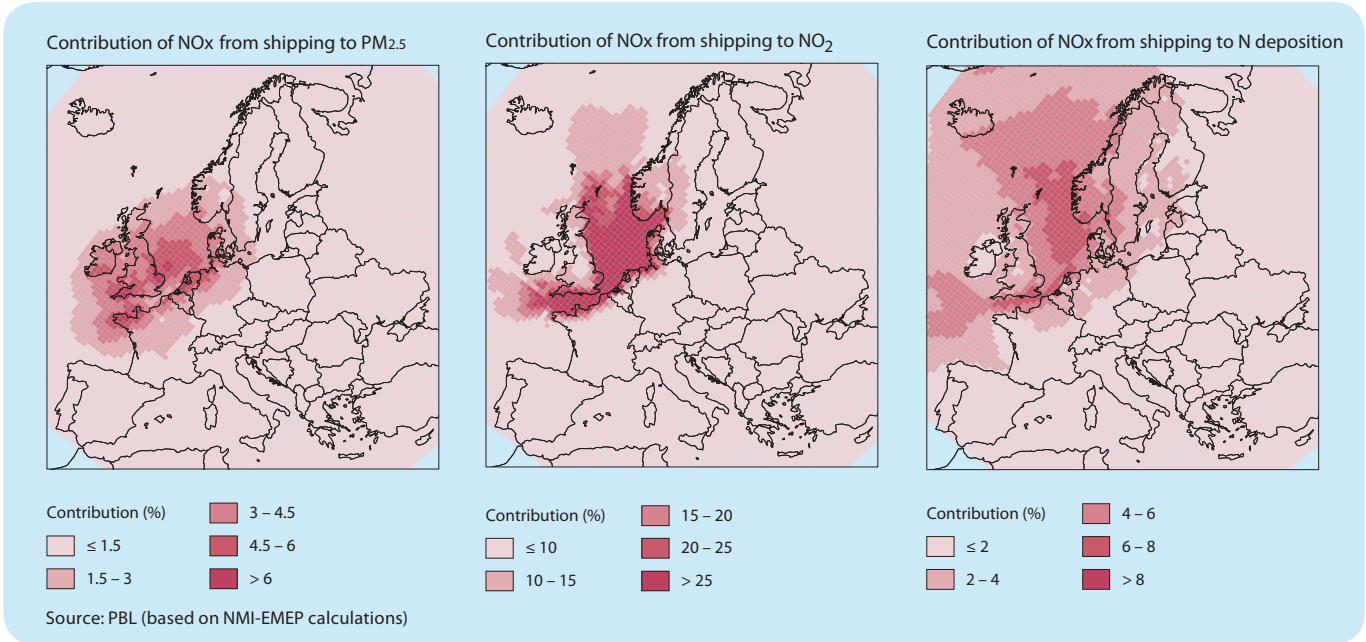


Figure: Contribution from shipping in 2030 to average annual $PM_{2.5}$ concentrations, average annual NO_2 concentrations and average annual N depositions.

ANDREAS ADELMANN/FLICKR.COM/ CC BY-NC-ND

Of the total ship emissions in the North Sea, an estimated 97 per cent are released within 100 nautical miles (185 kilometres) from the shore.

about five per cent to 446,000 tons. By contrast, in the same time period land-based emissions in the EU27 are expected to be more than halved under a baseline scenario (i.e. assuming only implementation of already adopted legislation).

To assess the environmental impacts of NOx emission control, two scenarios were developed. The main NECA scenario assumes that all ships built after 2016 and operating in the North Sea will comply with the IMO´s Tier III NOx standards, thus reducing their emissions by approximately 75 per cent as compared to the Tier II standards. By 2030, this scenario would reduce total North Sea NOx emissions by about 30 per cent as compared to the baseline, down to 317,000 tons. The limited overall emission reduction is a result of the slow turnover rate of ships, which usually have a life-length of 25–30 years.

To illustrate a situation where all ships in the North Sea meet the Tier III standards by 2030, an additional scenario (MFR) was constructed. Here, the resulting emissions would come down to 146,000 tons, nearly 70 per cent below the 2030 baseline level.

Looking at the health and environmental impacts in 2030 it was concluded that NOx emissions from North Sea shipping in line with the baseline scenario will be responsible for between 1 and 5 per cent of country-average PM concentrations, resulting in about 18,300 years of life years lost in that year. The highest contribution to average PM concentrations is found in the Netherlands and the UK with 7 and 6 per cent, respectively.

Contribution to country-average nitrogen dioxide (NO_2) concentrations will range from 7 to 24 per cent in the North Sea countries, highest in the Netherlands and Denmark. Contribution to nitrogen depositions, which enhance eutrophication and acidification and result in damage to biodiversity, ranges from 2 to 5 per cent, and is highest in Norway and Denmark.

In the NECA scenario these contributions would come down by about one third, and in the MFR scenario they would be cut by two thirds, as compared to the baseline. The lowered ship NOx emissions will also reduce damage to health and vegetation from ground-level ozone.

To protect people's health there are binding EU air quality standards for maximum allowed concentrations of NO_2 and PM, and many member states are currently facing infringement proceeding for failing to achieve those standards. Since the emissions from ships are carried by winds towards the densely populated areas on land, the establishment of a North Sea NECA would help to improve air quality.

The total monetised health benefits of a North Sea NECA were estimated to amount to between €443 million and €1928 million annually in 2030 – the range given depends primarily on the choice of valuation method. Benefits to ecosystems were not monetised and thus not included in these figures, but they are quantitatively described in the Dutch study report.

According to the studies, the Tier III standards (a 75 per cent NOx reduction compared to Tier II) can be achieved by three different currently avilable techniques, namely exhaust gas de-NOx systems (also known as Selective Catalytic Reduction, SCR); exhaust gas recirculation (EGR); or the use of liquefied natural gas (LNG) instead of conventional fuel oils. Of these, SCR – which can reduce NOx emissions by up to 95 per cent – is the most proven technology with more than 500 SCR systems already installed on ships.

The costs of a North Sea NECA were estimated to amount to €282 million annually in 2030. This implies an abatement cost of €1878 per ton of NOx reduced, which is up to 3–4 times higher than some other estimates. This relatively high abatement cost is explained, at least partly, by the fact that there is a high share of transit traffic in the North Sea. Sensitivity analyses show that if more sea areas around the EU were to become NECAs, the cost for the North Sea NECA could be more than halved.

Impacts on freight rates are expected to be only marginal and are therefore unlikely to lead to a shift towards land-based transportation modes.

Comparing the estimated monetised health benefits and costs for 2030 results in a total annual net benefit to society of between €161 million and €1646 million, which means that the benefits are between 1.6 and 6.8 times larger than the costs.

It is expected that the North Sea countries will meet this autumn to discuss the outcome of these two studies and possible next steps towards getting the North Sea designated as a NECA.

Christer Ågren

Assessment of the environmental impacts and health benefits of a nitrogen emission control area in the North Sea (June 2012). Published by PBL Netherlands Environmental Assessment Agency. *http://bit.ly/QEYaOE*

Economic impact assessment of a NOx emission control area in the North Sea (June 2012). Published by the Danish Ministry of the Environment, Environmental Protection Agency. *http://bit.ly/Utd3Hi*

Slow steaming saves money and the climate

Regulated speed reduction is a cost-effective and practical way to reduce greenhouse gas emissions and air pollution from shipping.

International shipping accounts for around three per cent of global CO_2 emissions. Shipping emissions will grow as world trade grows and, together with aviation, are estimated to comprise 4 to 5.7 per cent of global CO_2 emissions in 2020 (UNEP) and some 10 to 32 per cent in 2050 unless action is taken. The International Maritime Organization (IMO) has been discussing what to do since it was tasked with reducing emissions from international shipping by the 1997 Kyoto Protocol. An IMO action plan on market-based measures is now in its 10th year and IMO remains many years away from having a measure in force.

A good number of policy options, ranging from emissions trading, a global carbon levy, to efficiency trading and mandatory emission reductions by ship have been proposed, debated, studied and amended during this time and remain under consideration. The Energy Efficiency Design Index (EEDI) for new ships and Ship Energy Efficiency Management Plan (SEEMP) for existing ships were agreed in 2011 and enter into force on 1 January 2013.

At the IMO's Marine Environment Protection Committee (MEPC 61) in September 2010, the IMO considered a proposal from the Clean Shipping Coalition (CSC) to apply speed restrictions to ships to reduce emissions of CO_2 and other pollutants, with CSC noting that average ship speeds have crept up over the past 20 years despite rising fuel costs and that fuel consumption and thus emissions are a cubic function of speed. The IMO declined on this occasion to consider the issue further but feedback in the corridors of the meeting led two of the CSC members – Seas At Risk and Transport & Environment – to commission a study to investigate further and underpin the legal, environmental and economic feasibility of regulated slow steaming i.e. slow steaming at or beyond the level that companies initiate themselves.

Slow steaming, first practiced in the 70s, is a relatively recent phenomenon, being widely adopted as a response to the slump in demand and oversupply of ships that accompanied the start of the current economic crisis. The practice has been further extended since 2008 and has brought widespread benefits to shipping companies who have now embraced it as a useful operational measure to lower fuel costs.

Slow steaming has resulted in a significant reduction in emissions of GHGs and air pollution. However there is a widespread expectation in the industry that as the economy and markets pick up and excess capacity is brought back into service, speeds will increase again over time to meet the growing demand. If this occurs, we can expect a significant and sustained increase in ship emissions just at the time when long-term IMO initiatives to address shipping's carbon footprint are hopefully reaching a conclusion. Capping speeds at or around their current crisis levels – which estimates suggest could be 10–15% below their 2007 maximum – would prevent

LOUIS VEST/FLICKR.COM/ CC BY-NC

Highlights from the Study

- **Slow steaming has significant multiple environmental benefits.** A 10% reduction in fleet average speed results in a 19% reduction of CO_2 emissions even after accounting for the emissions of additional ships needed to deliver the same amount of cargo and the emissions associated with building the necessary additional ships. Emissions of SOx, NOx and probably black carbon will decrease in line with fuel use and CO_2 emissions. A ship speed reduction of 25% leads to a reduction in main engine fuel consumption of approximately 58% on a ship year basis. Fuel savings at the fleet level will be somewhat less, as explained in the report. Lower ship speeds will also reduce whale strikes and other harmful wildlife interactions.

- **Slow steaming has significant economic benefits.** Taking into account both the direct costs (fuel use, crew, capital costs of ships), indirect costs (additional inventory costs, adjustment of logistical chains) and the external costs (impacts of emissions on human health and ecosystems, climate impacts), the benefits of slow steaming outweigh the costs. This result is robust for a number of fuel price assumptions and discount rates. Implemented correctly, regulated slow steaming is cost-free to the shipping industry as a whole and entails marginal incremental logistic and supply chain costs to consumers.

- **There are very few, if any, evident technical obstacles to slow steaming.** Many shipping companies have experience with slow steaming in recent years. Even at very low engine loads, they have encountered only a few problems and these problems could be surmounted by small changes to operational procedures. Hence, it appears that there are very few technical constraints to slow steaming.

- **Regulated slow steaming is legally feasible.** Compulsory slow steaming can be imposed by a State on the ships flying its flag; on all ships in territorial waters (but can't be enforced while the ship is in transit or innocent passage); and in the Exclusive Economic Zone (EEZ) and the high seas as a condition of port entry of the imposing States.

- **Regulated slow steaming is feasible to implement.** Regulated slow steaming is relatively easy to monitor and enforce, and may have a lower administrative burden than some of the recently proposed MBMs. Speed can be monitored, both by ships and by regulators, and reported to regulators with little additional effort. Enforcement can be based on existing port State control instruments.

- **Regulated slow steaming delivers emission cuts in-sector.** Regulated slow steaming ensures that emissions in the shipping sector will be reduced from business-as-usual levels, regardless of the fuel price and demand for shipping.

- **Regulated slow steaming could avert a spike in ship emissions as the global economy picks up.** A cap on speed would reduce the possibility of an otherwise likely large and long-term spike in emissions if ships speed up in response to a recovery in demand. A cap set today around current average ship speeds will have little impact on industry.

- **Regulated slow steaming could apply at different levels.** A global regime would potentially have the largest impact on emissions; a regional initiative, e.g. in the EU, would have a smaller impact. Regulated slow steaming in the Arctic could prevent an increase in black carbon (BC) emissions there as shipping activity increases when sea routes open; BC has a particularly strong climate effect when deposited on snow or ice.

Reference: **Regulated Slow Steaming in Maritime Transport: An assessment of options, costs and benefits.** A study commissioned by Seas At Risk and T&E and undertaken by CE Delft, The ICCT & Mikis Tsimplis. February 2012. The report can be downloaded at: *www.transenv.eu/vesselspeedlimits-report*

this from happening and avoid a market speed up, largely negating the effect of any long-fought-for climate measure the IMO might adopt.

Speed restriction in the road and rail sectors is commonplace – mainly for safety but also for environmental reasons. Industry has however argued strongly that restricting speed in the shipping sector is not appropriate as it limits flexibility and will have negative implications for safety, logistics and costs, and result in a poor environmental outcome due to the need to build and operate additional ships.

The joint SAR/T&E study – conducted by CE Delft, Professor Mikis Tsimplis and The ICCT – effectively dismisses all the common concerns surrounding speed limitation as unfounded (see box). Moreover it clearly demonstrates that regulated slow steaming not only reduces CO_2 and other emissions dramatically, it actually saves the sector money. Implemented carefully – e.g. by including certain provisions for ships that need to travel faster – such an intelligent approach to regulated slow steaming would provide industry with the flexibility they say they need. Such a provision could also be constructed in a way that raised revenues, which could be used for climate change purposes.

When the Clean Shipping Coalition raised the issue of regulated slow steaming at the IMO in 2010, the idea was dismissed with very little discussion. Yet slow steaming has proven to be the only effective measure that has actually delivered significant in-sector emission reductions over past years. The industry may soon be on the verge of seeing average speeds increase again, potentially negating all those emissions reductions. The CE Delft study looks carefully at all the concerns about speed limitation and we believe provides the necessary background to enable the IMO to revisit the issue. The report of the study and a proposal from CSC have been submitted to IMO and will be considered at MEPC64 in October 2012.

Regulated slow steaming can produce emission reductions by 2030 and 2050 that rival any other reduction option being considered at IMO or EU level. And it can do so with a sizeable economic gain. If we are serious about tackling shipping GHG emissions and making sure that the shipping industry contributes its fair share to tackling climate change, then the IMO – and industry – must take regulated slow steaming seriously and give it full and proper consideration.

John Maggs, Seas At Risk and
Bill Hemmings, Transport & Environment
Members of the Clean Shipping Coalition

North American ECA comes into effect

The Emissions Control Area (ECA) surrounding North America came into effect on 1 August, meaning that all ships operating within 200 nautical miles of the United States and Canada coastline must use marine fuel with a sulphur content not exceeding 1.00 per cent by weight.

When applying to the International Maritime Organization (IMO) for designation of this sea area as an ECA, the US Environment Protection Agency estimated the annual overall cost of the ECA at US$3.2 billion in 2020, compared to the monetised health-related benefits in the US which were estimated to amount to up to US$110 billion in that same year.

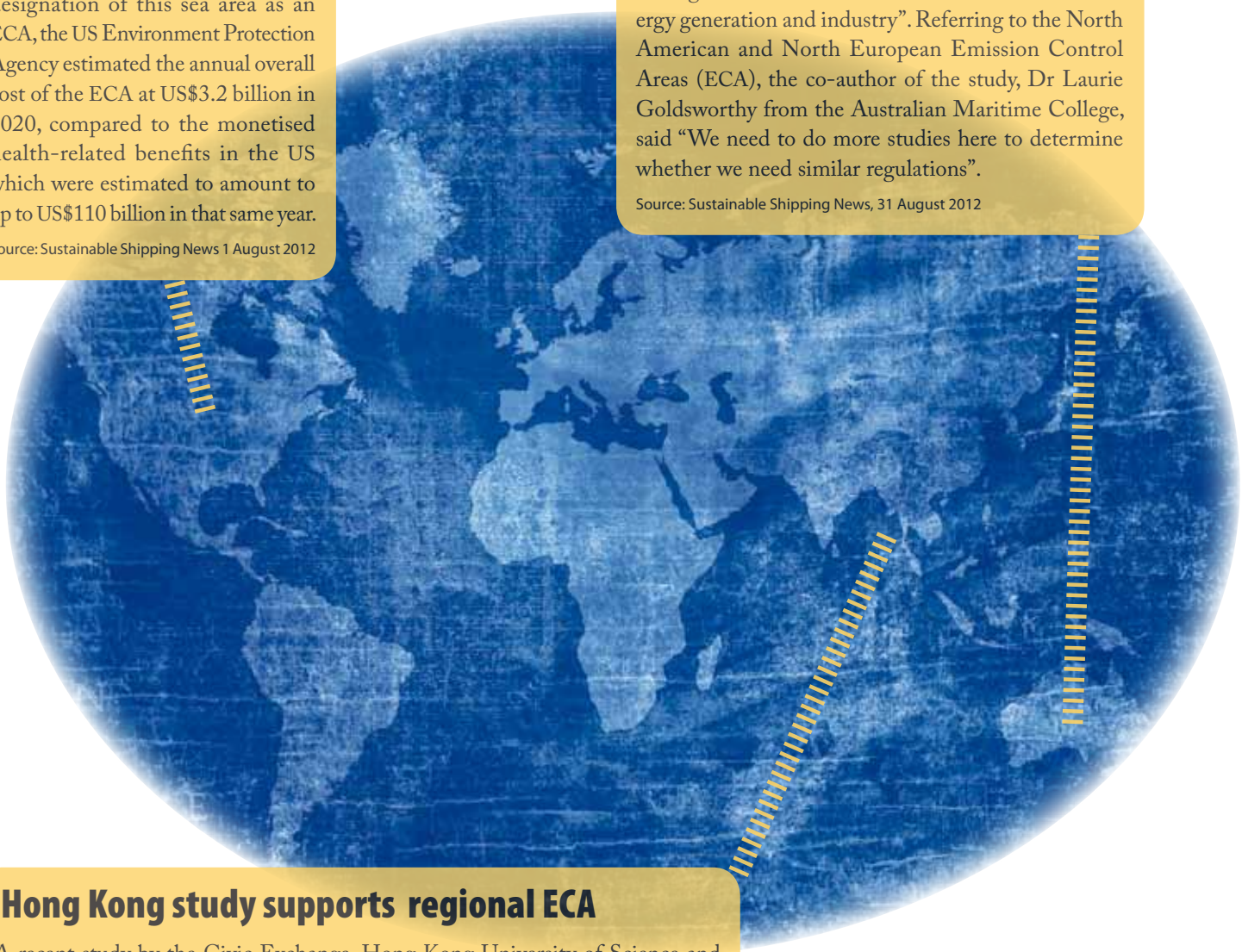
Source: Sustainable Shipping News 1 August 2012

Researchers raise prospect of Australian ECA

Around 30 per cent of man-made nitrogen oxides (NOx) emissions and 20 per cent of sulphur dioxide (SO_2) emissions in the Australian region come from shipping, according to a new study.

Dr Ian Galbally, who works for Australia's national science agency, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), said that NOx and SO_2 emissions from ships were "comparable in magnitude with other national sources such as energy generation and industry". Referring to the North American and North European Emission Control Areas (ECA), the co-author of the study, Dr Laurie Goldsworthy from the Australian Maritime College, said "We need to do more studies here to determine whether we need similar regulations".

Source: Sustainable Shipping News, 31 August 2012



Hong Kong study supports regional ECA

A recent study by the Civic Exchange, Hong Kong University of Science and Technology and The University of Hong Kong shows that excessive deaths in Hong Kong and the Pearl River Delta due to marine emissions could be reduced by 91 per cent should an Emission Control Area (ECA) mandating the use of fuels capped at 0.1 per cent sulphur content be introduced.

"The findings obviously showed that ECA is the most effective measure to improve public health," said Dr Chit-Ming Wong of the Hong Kong University. "However, as vessel speed reduction could also reduce 41 per cent of the excess deaths and it costs very little when implementing, this control measure should also be considered."

Source: Sustainable Shipping News, 20 September 2012

Energy Efficiency: A deal, but not a great one

On Thursday June 14 all three branches of EU government reached agreement on the Energy Efficiency Directive (EED). Formal adoption will be completed later this year.[1]

The final deal is an improvement compared to earlier versions proposed by member states, but falls a long way short of the ambition required to meet the EU's 20 per cent target. The Coalition for Energy Savings estimates that the directive will deliver just 15 per cent savings by 2020 compared to business as usual. Member states are thus set to deny themselves many of the potential benefits that a stronger directive would have brought.

It seems that opposition to reducing energy waste, and a failure to see the bigger picture, have prevented a truly ambitious agreement from materialising.

Nevertheless, it is an important step forward in realising the potential of energy savings in the fight against climate change, and should inspire other countries in the world to take action on energy efficiency.

Perhaps the most revolutionary achievement of this directive is that – for the first time ever – it puts a precise definition of the 20 per cent by 2020 target into legal text. Specifically, the EU's energy use in 2020 must not exceed 1474 million tons of oil equivalent (Mtoe) of primary energy, or 1078 Mtoe of final energy (energy after transformation from its raw form). To put this into context, China's primary energy consumption in 2004 was 1379 Mtoe; in 2009 it was 2270 Mtoe.

Regrettably however, despite the best efforts of the European Parliament, the directive does not require legally binding overall national targets. This is the one thing that past experience tells us would have given the best chance of the 20 per cent target being met. Instead, member states must adopt indicative, i.e., voluntary, targets. In 2014 the Commission will review progress towards the 2020 target and if necessary they will propose further measures to ensure the target is met.

Member states must also establish schemes that will oblige energy companies or distributors to deliver cumulative annual energy savings equivalent to 1.5% of the previous year's final energy sales. These will help to establish clear financing and delivery mechanisms for energy efficiency measures, whilst inducing a shift in the business models of energy companies towards the provision of energy services, and not just selling large amounts of energy.

Unfortunately, this provision is much weaker than originally intended: energy sold to transport is excluded, and member states managed to introduce a wide range of loopholes which, taken together, effectively reduce the savings rate to more like 1 per cent.

Member states' desire to diminish the impact of the directive also resulted in the 3 per cent annual renovation rate for public buildings being squeezed to only cover central government buildings. Provisions on public procurement, industrial audits and combined heat and power generation are now also little more than voluntary.

On the other hand, the Parliament managed to win some important amendments in at least three areas.

First, whereas the Commission's proposal included no direct provisions addressing the EU's residential and commercial buildings, the final text requires member states to prepare long-term "renovation roadmaps" for their entire building stock.

Second, member states are obliged to facilitate the establishment of 'financing facilities', designed to raise money for energy efficiency purposes and to help ensure that it is spent effectively.

Finally, the Parliament also managed to secure a written statement from the European Commission which details the steps it will take to make adjustments to the EU's Emissions Trading System to take account of the EED's emission-reducing impacts.

Marks of the NGO effort to obtain the strongest possible directive are clear in many places. For instance the fact that the 2014 review must now be accompanied by – and not just 'followed by' – proposals for further measures; the clear expression of the savings rate to be delivered by energy company obligations, and the introduction of new concepts such as the renovation roadmaps and financing facilities.

But of course, any directive is only as good as the way it is transposed into national law, and implemented on the ground. As a network we will now be working hard to ensure that this is done as ambitiously and as effectively as possible – and also to make sure that whatever comes forward in 2014 will actually deliver the 20 per cent target.

Erica Hope,
CAN-Europe senior policy officer

LENETS_TAN / FOTOLIA

New features like "Renovation roadmaps" must now be turned into reality in member states.

This article has previously been published in HotSpot #65, a newsletter from CAN-Europe.

1) The directive was formally approved by the Parliament on 11 September and will be processed by the Council of Ministers in October

Finding climate policy for the agricultural sector

JOSIE / FOTOLIA

A trading system for agricultural greenhouse gas emissions results in less leakage than emission caps or a tax on livestock, according to a new report by the EU's Joint Research Centre (JRC). But the practical difficulties of trading with emissions from diffuse sources such as livestock and arable land are not even mentioned.

Sector-specific policy is an important instrument to achieve overall climate targets and there is a great need for studies that examine different possible ways to cut greenhouse gas (GHG) emissions from the agricultural sector. The report "Agricultural GHG emissions in the EU: an exploratory economic assessment of mitigation policy options", examines four main theoretical approaches to new policy for 20 per cent emission cuts by 2020.

Four different approaches are investigated:

- Two of the approaches are based on the adoption of emission caps. In one case reductions are equally shared by all countries
- and in another case emission reductions are shared according to the principles of the EU's Effort Sharing Decision (ESD).
- The third approach is to introduce a trading system for agricultural greenhouse gas emissions in the EU,
- and the fourth approach is the introduction of a tax on livestock.

In the baseline scenario, which includes existing and already approved legislation, agricultural GHG emissions come down by 3 per cent by 2020. The primary reason for this reduction is that the ongoing transition from coupled payments for beef production to decoupled payments leads to a lower number of cattle and thus lower emissions of methane.

Further reductions in the number of livestock are to be expected under all four approaches. The number of beef cattle is estimated to decrease by almost 30 per cent with the introduction of emissions caps or a trading system and by almost 40 per cent with the introduction of a livestock tax. Beef production, however, would only decrease by 10–12 per cent in the first three cases and by 16 per cent in the latter. With emissions caps or a trading system cereal production would drop by about 10 per cent.

One of the more profitable measures, it turns out is to let histosols (soils with a high organic content) lay fallow. Such soils are found primarily in northern countries, like Finland, Sweden, Ireland and the UK. Relatively big GHG reductions are also achieved by reductions in the application of mineral fertiliser as well as by manure management and application.

Table: GHG emissions (million tonnes CO_2eq) and emission reductions (%) (2020 compared to the base year (2004)

	Baseline (2004)	Reference scenario	Emission cap - equal	Emission cap - ESD	Emission trading	Livestock tax	Ammonia-limiting measures	Balanced fertiliser management.	Feed with a lower nitrogen content	Emission trad. + Balanced fertiliser.
Total GHG emissions EU-27	460	446.2	371	371.4	371.3	370	457	427	439	370
% reduction to BAS (2004)		-3,0	-19,3	-19,3	-19,3	-19,6	-0,7	-7,2	-4,6	-19,6
Net increase in emission in the rest of the world (leackage)			16.7	17.1	14.6	25.6	0.3	-0.1	0.1	8.3
% reduction to BAS (2004)		-3,0	-15,7	-15,5	-16,1	-14,0	-0,6	-7,2	-4,5	-17,8

Part of the loss of production will be replaced by imports from outside the EU, thus leading to increased emissions elsewhere, a phenomenon known as leakage. An increase in the imports of beef, in particular from Brazil and Argentina, where the emissions of methane per kilogram of product are greater than in Europe, is estimated to result in 25.6 per cent of the intended emission reductions from a livestock tax simply being exported. The two cap approaches would induce a leakage of about 17 per cent while the introduction of a trading system involves the least leakage, 14.6 per cent.

Many of the problems of leakage could however be avoided by instead setting a climate tax on the consumption of agricultural products – an approach that unfortunately is not discussed in the report.

The modelling tool "Common Agricultural Policy Regional Impact" (CAPRI), which was used in the study, handles above all changes in production, consumption and varying degrees of management of the existing production systems, but it cannot take into account the introduction of new technologies or alternative ways of management, even though these would be likely responses to all approaches except the livestock tax.

To still get an idea of what new technologies and ways of management could mean, three additional scenarios for specific technology shifts were assessed.

- One with the introduction of a series of ammonia-limiting measures, such as covered manure storage, stable adaptation, etc.
- Another where farms implement more balanced and effective fertiliser management.
- And a third scenario where feed with a lower nitrogen content is introduced.

Of these three additional scenarios, more balanced fertiliser use has the highest potential and can lead to additional GHG emission reductions of 4.3 per cent. Next comes lowering the nitrogen content in the feed, with reductions of 1.6 per cent compared to the reference scenario. The specific ammonia measures were estimated to actually lead to an increase in emission of nitrous oxide, so-called pollution swapping, and therefore to a small increase in greenhouse gas emissions.

The researchers have also combined the two technical scenarios that lead to climate mitigation with the emission trading scenario. When trading is combined with technical measures – which would be a likely reaction to such a measure – leakage is almost halved, to 8.3 per cent of the intended emission reduction. This shows that the initial estimates of the leakage must be seen as a worst case, also for the two cap scenarios, even though it is not possible to fully predict to what extent these approaches will induce the implementation of new technologies and management.

After reading the report, it may appear as if a trading system would be the best option for the EU to reduce agricultural greenhouse gas emissions. But the authors never go as far as discussing how such a trading system could be implemented in practice.

Any trading system requires that emissions can be easily quantified. At the farm level this is however extremely difficult and costly, as methane emissions differ between individual animals and different soils emit varying amounts of nitrous oxide. The model has been built on trading between so-called NUTS2 regions. Although it might be a bit easier to estimate emissions at a regional level, it is still easy to imagine the bureaucracy that would be required to make a trading system actually work.

Unlike sectors such as transport and energy, there is right now no EU policy with the expressed purpose of reducing GHG emissions from the agricultural sector. Agricultural GHG emissions, which represent about 9 per cent of the EU total, are included under the ESD, which aims to reduce these emissions by 20 per cent to 2020. But the ESD contains no specific sector requirements. So despite the obvious shortcomings in terms of not looking into the practical implementation, the study can be seen as a first important step towards developing actual policy to reduce agricultural greenhouse gas emissions.

Kajsa Lindqvist

Agricultural GHG emissions in the EU: an exploratory economic assessment of mitigation policy options. 2012. JRC. Authors: Ignacio Pérez Domínguez, Thomas Fellmann, Heinz-Peter Witzke, Torbjörn Jansson and Diti Oudendag with the collaboration of Alexander Gocht and David Verhoog *http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=5079*

Ten one-liners for air policy

In politics, one-liners are in vogue because they bring the message back to the core. Nuances do not come across in a debate. The same seems to apply to air pollution policy. The multitude of information seems to paralyse policy, and not only in the Netherlands. So here are ten 'one-liners' for boosting air pollution policy, in the spirit of the Ten Commandments.

One-liners linger. Air pollution is complex and, especially for EU countries, taking measures is not easy. The ten crisp conclusions in the form of one-liners partly rest on experience gained in negotiations in the EU and the UN, and partly on literature.

1 Air pollution is still a problem

Since the eighties, emissions into the air in Europe have been reduced considerably and air quality has profited[1,2]. Yet in many parts of Europe, concentration and deposition levels exceed standards and sustainable levels. The Netherlands is a 'hot spot' for many forms of air pollution with a relatively high load of acid and nitrogen, but also high levels of ozone, particulate matter, nitrogen oxides, heavy metals and persistent organic substances3. The Netherlands struggles to meet air quality standards for nitrogen dioxide and particulate matter. The country has taken many measures and has one of the lowest emissions per GDP or per capita. However, the Netherlands still has the highest emissions per km^2.

2 Air pollution policy in EU countries comes from Brussels

EU member states have transferred much of their environmental policy-making to the EU, estimations are 80%. The European Commission prepares legislation and monitors the implementation by the member states. The Netherlands mainly implements EU regulations. This is reflected by the decline in the number of civil servants at the Ministry of Environment. Twenty years ago, 1250 employees worked there, now around 150.

3 EU standards are national standards

Air quality must meet certain requirements, for example the fine dust concentration must not exceed 40 micrograms/m^3 (PM_{10}, yearly average). This standard has been prepared by the European Commission and the member states. EU countries have subsequently accepted this standard at an Environmental Council meeting. By accepting the same air quality standards, all EU countries created a level playing field for health and nature. You can also have a level playing field for industry with equal emission requirements. When the latter conflicts with an air quality standard a country should apply stricter emission requirements. A concentration requirement supersedes an emission standard.

4 Benefits of air measures are greater than the costs

Two cost–benefit analyses (CBAs) were carried out for the Gothenburg Protocol, which was completely revised in May, one for all countries[4] and one for the Netherlands[5]. Without exception, CBAs show that the benefits of further measures to reduce air pollution are many times greater than the costs. Not so strange, because fewer hospitalisations and a longer life (productivity and paying taxes) are substantial benefits. Nature (biodiversity) also benefits from measures. Unfortunately, it is not easy to substantiate this in monetary terms. Benefits are thus usually underestimated. The costs tend to be lower than first calculated.

5 International emission reduction measures are cheaper than local measures

When concentrations exceed air quality standards, additional measures should be taken. For nitrogen dioxide and particulate matter many EU countries face this problem. The Netherlands has chosen to take action through the National Air Quality Collaboration Programme (NSL). The NSL consists of mostly local measures to reduce concentrations in certain streets. These are expensive source-oriented measures (e.g. cleaner buses, soot filters on diesel cars) and effect-oriented measures (e.g. one-way traffic in streets). The costs of NSL are estimated at 1.5 to 2 billion euro over nine years. In general, it is much more effective and cheaper to reduce emissions at the European scale[5,6,7]. Moreover, in contrast to local measures the costs of internationally agreed lower emission limits are borne by the target groups (industry, traffic etc.) and not governments.

6 Environmental costs are offset by other competitive factors

The Netherlands Environmental Assessment Agency (MNP) has investigated8 whether environmental rules cause companies to leave the country. MNP concluded that the costs of environmental regulation represent only a small part of the total production costs and they are less important than other competitive factors such as favourable geographical location and the presence of trained personnel.

Yet you see large Dutch farms in Eastern Europe and elsewhere. Apparently, the more strict requirements on environment and animal welfare in the Netherlands impose more weight than logistical and other advantages. This is not good for the environment and the Dutch economy.

The exodus of intensive livestock farming from the Netherlands shows that equal international standards are important.

The overall conclusion of one-liners 4, 5 and 6 is: Far-reaching international measures are a top priority.

7 Integration of air and climate policy is inevitable

The Gothenburg Protocol (UN/ECE Convention on Long-range Transboundary Air Pollution (CLRTAP)) and the EU National Emission Ceilings Directive save billions through an integrated approach to air pollution compared to a uniform

reduction approach per substance. Air pollution and greenhouse gases both originate from the burning of fossil fuels and agriculture. Also, various effects are correlated. Ozone is the third most important greenhouse gas after carbon dioxide and methane9. Also, black carbon is an important greenhouse gas. Integration is more efficient and cheaper, and it creates opportunities. For developing countries, improved air quality can be a profitable and attractive side effect of climate change mitigation. In 2050 air pollution will be the main cause of premature deaths, causing 3.6 million early deaths per year worldwide, especially in Asia[10]. In a workable future, negotiators for climate change would define the reduction targets and regionally these goals are the basis for formulating measures for air pollution.

8 International environmental agreements have to be reformed

The economic crisis is not the main cause of the collapse of international environmental policy-making in recent years. Unpopular measures that deliver in the long-term are not attractive to politicians. Environmental treaties have a negative motivation for they focus on solving problems by (reduction) obligations. A first step to solve a problem usually succeeds because low-hanging fruit is picked. Further action is more difficult. It is of no help that decisions are taken by consensus. Also, the enforcement of agreements is an issue. Non-compliance with obligations rarely leads to sanctions.

This has to be solved, but how? An important improvement would be that the intent of environmental treaties should be positive. Solutions must lead to benefits instead of limitations. An example of a more positive solution for climate change would be to link the credit, energy and climate crises[11]. End all stimulation of energy use (rebates for large consumer's tax breaks and subsidies) and billions could be saved and used to finance deficits. This would further stimulate the process of making alternative energy cheaper than fossil energy. This benefits the environment, oil and gas will last longer and we would be less dependent on the Middle East and Russia.

9 Scientific knowledge steers international policy

Since the Treaty of Lisbon (2009), the European Commission speaks for all EU countries during plenary sessions of international environmental meetings. This has its advantages. Obviously, the EU coordinates its inputs with member states. Although the Netherlands is small, the influence of the Netherlands in the EU and at the international environmental conventions is relatively large, because the Netherlands has some excellent environmental institutes. These provide reports of high quality and they are involved in preparatory groups. It is in these groups that decisions are prepared. A move from a PM_{10} standard (includes all larger particles and sea salt that is considered less harmful) to a standard restricted to smaller particles $PM_{2.5}$ or PM_1 (mostly combustion aerosols), can only be achieved when there is consensus among scientists.

10 Influence comes with powerful (political) commitment

Science yes, but essential is a powerful and political input in Brussels. Indeed, the Commission has the right of initiative for legislation. This means that a minister already at the front of the policy process must seek cooperation with colleagues in the Environmental Council to get a subject on the agenda. In the elaboration of policies and measures, the negotiating civil servants must feel supported by the official and political management. At an Environmental Council the minister, who is fully aware of the development on a file, should vigorously promote a desired decision.

Finally

Obviously, nuances and details are sacrificed when you reduce information in the field of air pollution to ten one-liners. I hope that they can guide civil servants and politicians to a successful air pollution policy.

Johan Sliggers

The National Institute for Public Health and the Environment (RIVM) currently employs Johan Sliggers (johan.sliggers@rivm.nl, tel. + 31.30.2743147). He has been head of delegation for the Netherlands from 1998–2010 preparing international agreements in Geneva (CLRTAP) and Brussels (EU) to reduce air pollutant emissions.

References:

1) Sliggers Johan and Kakebeeke (editors), **Clearing the air, 25 years of the Convention on LRTP**, *http://www.unece.org/environmental-policy/treaties/air-pollution/publications.html, 2004.*

2) Amann M. et al, **Environmental Improvements of the 2012 Revision of the Gothenburg Protocol**, IIASA, CIAM report 1/2012, version 1.1, September 10, 2012.

3) Sliggers Johan e.a., **Convention on Long-range Transboundary Air Pollution, Dutch Hope**…. (in Dutch), Milieu no. 3/Dossier, pages 29-33, 2009.

4) Holland M. et al, **Cost Benefit Analysis for the Revision of the National Emission Ceilings Directive: Policy Options for revisions to the Gothenburg Protocol to the UNECE CLRTAP**, *http://www.unece.org/env/lrtap/workinggroups/wgs/docs49thsession.html,* AEA/ ED47788 Final Issue 2, 2011.

5) Smeets W. et al, **Costs and benefits for stricter emission ceilings: national evaluation of the Gothenburg Protocol** (in Dutch), www.pbl.nl, PBL-publicatienummer 500092002, 2012.

6) **Particulate Matter: a closer look**, p. 14, Netherlands Environmental Assessment Agency report no. 5000370011, *www.rivm.nl*, 2012.

7) Amann M. et al, **An Updated Set of Scenarios of Cost-effective Emission Reductions for the Revision of the Gothenburg Protocol: Background paper for the 49th Session of the Working Group on Strategies and Review**, Geneva, September 12-15, 2011, IIASA, CIAM report 4/2011, Version 1.0, *http://www.unece.org/env/lrtap/workinggroups/wgs/docs49thsession.html*, 2011.

8) Brink. C et al, **Environmental policy and competition** (in Dutch), MNP rapport 500091002/2007, *www.pbl.nl*, 2007.

9) **IPCC, Fourth assessment report: Summary for Policy makers** WG1, p. 4, 2007.

10) **Environmental outlook to 2050: The consequences of inaction**, *www.oecd.org/environment/outlookto2050*, 2012.

11) **VVM-sectie Lucht en Klimaat, Link Credit, Energy and Climate Crises** (in Dutch), Milieu no. 4, p. 21, July 2012.

MARCEL GERMAIN /FLICKR.COM / CC BY-ND-NC

EU sulphur rule has improved air quality

Sulphur dioxide emissions from shipping have sharply decreased in EU ports thanks to an EU policy which limits sulphur content in fuels for ships at berth or at anchor in ports. Scientists at the European Commission's Joint Research Centre measured key air quality parameters in Mediterranean harbours before and after the entry into force of the low-sulphur requirements in January 2010.

In European harbours they found an average decrease of 66 per cent in concentrations of sulphur dioxide (SO_2), a pollutant that poses risks to health and the environment. Measurements taken in a non-EU port showed that levels of SO_2 remained the same.

From January 2010, all ships berthed or anchored in EU harbours have had to use fuels with a sulphur content of less than 0.1 per cent, while previously a sulphur content of up to 4.5 per cent was allowed.

Source: JRC news release, 14 August 2012
Information: *http://bit.ly/VNz7w7*

MEPs back proposal for greener leisure boats

The European Parliament's internal market committee on 21 June endorsed a draft directive that would set slightly tougher emission limits for recreational boats and personal watercraft.

The proposed limits on nitrogen oxides (NOx), hydrocarbons and particulate matter are in line with standards already in place in the United States. If approved, engines will be designed to emit 20 per cent less NOx and hydrocarbons, and 34 per cent less particulate matter.

Concerning the compliance deadline, the committee proposes that most engines should comply by the end of 2014, rather than three years after the law enters into force as proposed by the European Commission. The committee also wants the Commission to review the emission limits five years after they are adopted in member states, to assess if they need to be strengthened further.

Source: ENDS Europe Daily, 25 June 2012

JIRI HERA / FOTOLIA

Tougher ship sulphur limits adopted by EU parliament

New EU legislation aimed at reducing sulphur pollution from ships was adopted by the European Parliament on 11 September. The revised EU directive implements the international sulphur standards adopted by the International Maritime Organization (IMO) in 2008, ensuring they can be properly enforced at EU level.

The revised EU directive confirms that a global limit of 0.5 per cent sulphur will apply in all EU seas by 2020. This represents an 85 per cent cut compared with today's 3.5 per cent limit. Prior to this decision some uncertainty remained over the entry-into-force date in Europe of the IMO's global limit, but the EU has now sent a clear signal that it wants lower-sulphur fuels earlier rather than later.

Also confirmed was the even stricter sulphur limit of 0.1 per cent for 2015 which applies in so-called Sulphur Emissions Control Areas (SECAs), i.e. in the Baltic Sea, the North Sea and the English Channel.

Environmentalist groups welcomed the adoption of the new law as a very significant step towards the reduction of air pollution from shipping. T&E shipping specialist Antoine Kedzierski said: "This is a very encouraging first step. Now the EU needs to follow the USA and Canada by making the entire EU coastline a low-SO_2 and low-NOx zone, and by beefing up its enforcement regime."

DAN FOY /FLICKR.COM / CC BY

The Parliament's rapporteur, Green MEP Satu Hassi, who brokered the final legislative agreement, stated: "The new rules adopted today represent a major concrete measure for reducing air pollution in Europe and improving public health. Thankfully, the final legislation remains ambitious and in line with the EU's international commitments in spite of intense industry lobbying. The legislation will deliver significant yet cost-effective sulphur pollution reductions, with the cost of savings on healthcare far outweighing the costs of reducing sulphur emissions."

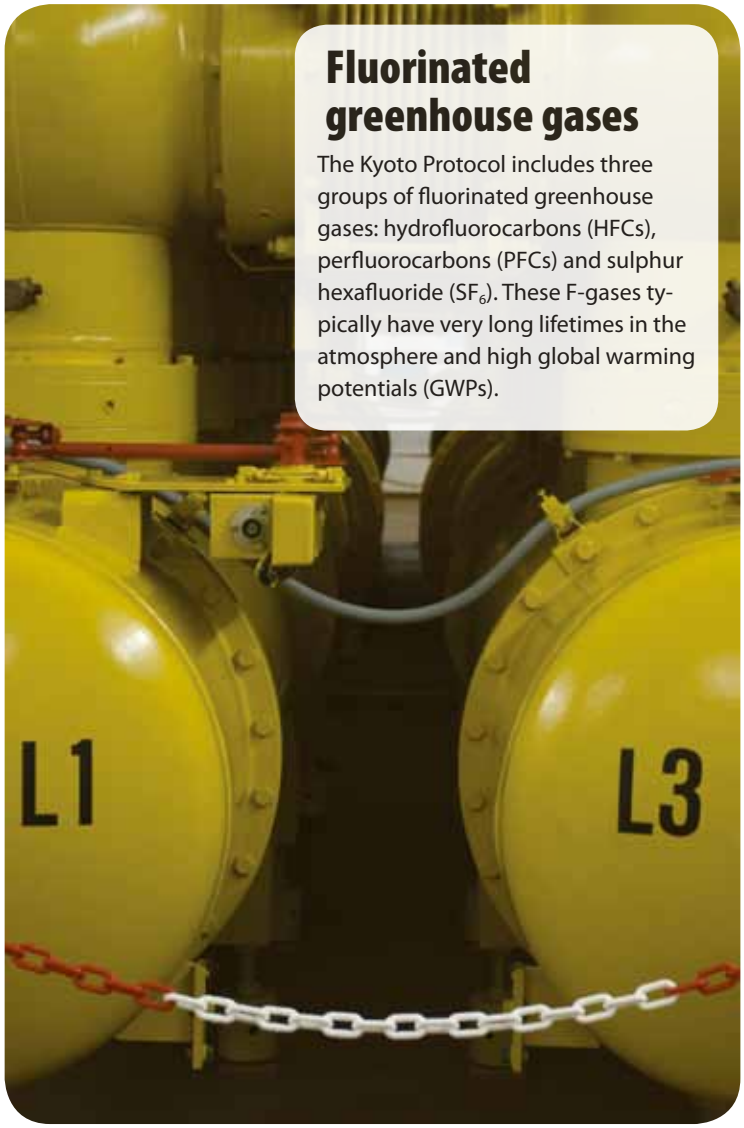
Press release from EEB and T&E: *http://bit.ly/ObO3ic*
Press release from the Greens: *http://bit.ly/RGV4s3*

F-gases still a problem

The production of fluorinated greenhouse gases in the EU has decreased in terms of tonnage, but since the proportion of gases with the highest global warming potentials (GWP) simultaneously has increased there is no reduction in the overall climate impact.

In accordance with the F-gas regulation ((EC) No 842/2006)), all companies producing, importing or exporting more than one tonne of fluorinated greenhouse gases (F-gases) must report quantities and intended applications to the European Environment Agency (EEA). In 2011, 120 companies submitted their reports, which was 12 per cent more than in the previous year. [1]

In all three categories reported the amount of F-gases, measured in tonnes, had decreased: production (-5%), import (-6%) and intra-EU sales (-12%). But the different F-gases differ greatly when it comes to GWP, for example the hydrofluorocarbon HFC-134a has a GWP of 1,430 compared to sulphur hexafluoride (SF_6), which has a GWP of 22,800 (GWP calculated over 100 years). Re-calculated in carbon dioxide equivalents, the result is somewhat different, production increased slightly (+1%), while imports and intra-EU sales are still decreasing (-8% and -11%).



ZE CLOU /FLICKR.COM / CC BY-NC-SA

SF_6-encapsuled high voltage switch matrix.

Fluorinated greenhouse gases

The Kyoto Protocol includes three groups of fluorinated greenhouse gases: hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). These F-gases typically have very long lifetimes in the atmosphere and high global warming potentials (GWPs).

Over the five years for which data has been reported, no discernible trends can be seen. The use of F-gases appears to be relatively stable, which is of great concern at a time when all greenhouse gases must be reduced. If we look back instead over the last twenty years, there is even more reason to worry. Between 1990 and 2010 emissions from the consumption of HFCs increased by 82.3 million tonnes of CO_2-equivalents, which makes this the category of greenhouse gas emissions that increased the second most in absolute terms, only beaten by CO_2 emissions from road transport. [2]

The use of HFCs for cooling (refrigerators, freezers and air conditioners) is the most common application for F-gases, when it comes to quantity (62%), but also in terms of climate impact (57%). SF_6 is used as an insulating medium in electrical equipment and in terms of quantity it only accounts for two per cent of F-gases, but because of its very high GWP, the use of SF_6 in electronics is the application with the second largest climate impact (21%).

In June, six environmental NGOs demanded that climate commissioner Connie Hedegaard should propose a ban on all use of SF_6.[3]. A newly published report shows that there are cost-effective alternatives to all common applications.[4] Jacqueline McGlade, Executive Director for EEA argues along the same lines:

"For certain applications, viable alternatives to F-gases already exist. This makes them an ideal candidate to replace with less harmful alternatives, in order to limit the growth of emissions."

The EU Commission intends to put forward a proposal on further measures to reduce F-gases at the end of this year.

Kajsa Lindqvist

1) **Fluorinated greenhouse gases 2011**, EEA Technical report No 12/2012, *http://bit.ly/SGvkCX*

2) **Annual European Union greenhouse gas inventory 1990–2010 and inventory report 2012**, EEA Technical report No 3/2012 *http://bit.ly/NXskhP*

3) EEB press release 26 June 2012 *http://bit.ly/PngV94*

4) **Cost-effective SF6-free options available for switchgear – Validation of recent studies for the European Commission.** By Jos Benner, Marit van Lieshout and Harry Croezen. Available from CE Delft: *http://bit.ly/OUi9ga*

400-ppm milestone has been reached

For the first time monthly mean levels of carbon dioxide above 400 parts per million have been recorded over the entire Arctic and parts of Japan. Globally, it will take another few years before the symbolic level is passed. For 2012 it is estimated that the global average level will be approximately 393 ppm.

Any increase in carbon dioxide in the atmosphere is serious, but the passing of the 400-ppm level is mainly of symbolic significance.

"In fact, we don't know what a safe level of CO_2 would be," says Pieter Tans of the US National Oceanic and Atmospheric Administration's Earth System Research Laboratory in Boulder, Colorado to New Scientist.

Source: New Scientist, 7 June 2012

Porsche behind noise proposal

An engineer at Porsche stood as the author of a "compromise" amendment for stricter noise standards that the Czech rapporteur Miroslav Ouzký circulated to the EU Parliament Environment Committee. The discovery was made by Transport and Environment and revealed one week before the proposal was to be put forward for voting in the committee.

"This is not a compromise," said T&E campaigner Greg Archer to ENDS. "The limit values proposed by Mr Ouzký for phase one could lead to noise levels from high-performance sports cars more than doubling."

Miroslav Ouzký's explanation for what happened is that he only used the Porsche document as a template. Because of the incident, committee chairman Matthias Groote decided together with all political groups to postpone the voting to 10 October.

Source: Transport and Environment press release 12 September 2012 and ENDS 13 September 2012

New CO_2 standards for cars and vans

Carbon dioxide standards have pushed the auto industry to achieve the same efficiency improvements in the last three years as achieved in the previous eight years. The European Commission has now presented proposals on how standards can be tightened from 2020 and onwards.

Two new carbon dioxide (CO_2) targets were presented in a draft proposal from the European Commission on 11 July; average emissions from new cars should be 95 grams per kilometre by 2020 and the equivalent for vans 147 grams per kilometre by 2020.

Connie Hedegaard, EU Commissioner for Climate Action, emphasised the economic benefits of the proposed legislation: "With our proposals we are not only protecting the climate and saving consumers money. We are also boosting innovation and competitiveness in the European automotive industry. And we will create substantial numbers of jobs as a result. This is a clear win-win situation for everyone. This is one more important step towards a competitive, low-carbon economy."

Ivan Hodac, Secretary General at the European Automobile Association commented: "These are tough targets – the toughest in the world" and continued: "Considering that most manufacturers are losing money in Europe at the moment, the industry needs as competitive a framework as possible. Targets – while ambitious – must be feasible."

Environmental organisations welcomed the new legislation, but also argued that it had been possible to adopt an even stricter standard of 80 gram per kilometre. This can be justified by the fact that it has been very easy for the industry to adapt to the current rules. In three years (2009-2011) the average emissions in the EU-15 decreased by 18.1 g/km, which is almost as much as the reduction of 18.9 g/km in the eight years (2000-2008) prior to the introduction of the standard. Greg Archer, programme manager for clean vehicles at Transport and Environment (T&E) said:

"Last time the EU set a CO_2 standard for new vehicles, carmakers whined that cars would become unaffordable. That didn't happen, car prices came down in real terms and consumers have benefited considerably from improved fuel efficiency."

Another fact that indicates there is scope for tougher targets is that several member states (Belgium, Denmark, France, Ireland, Italy, Malta, the Netherlands and Portugal) had by 2011 already achieved average emissions below the target for 2013 (130g/km).

Environmental groups also expressed the need to adopt more long-term targets, for instance a 60 gram per kilometre target by 2025. The Commission plans to propose standards for 2025 and 2030 in 2014. Such longer-term targets have already been adopted in the United States in July this year. Greg Archer T&E:

"Thanks to new rules put in place by the U.S. administration, the typical American car by 2025 will include more advanced technologies for fuel efficiency than the average European vehicle. There is a real danger that Europe is going to lose its competitive edge in low carbon vehicles if suppliers don't get the investment certainty needed to develop advanced technologies."

The Commission is also criticised for proposing a van standard that is much weaker than the one for cars. Compared to 2010 average emissions the proposed standards will mean a 30 per cent reduction for cars, but only a 19 per cent reduction for vans. Greenpeace writes in a press release: "[This] could encourage carmakers

MURRAY ADAMSON /FLICKR.COM / CC BY-ND

Aiming for CO_2 targets beyond 2025?

to attempt to reclassify large cars as vans to avoid tighter targets".

The main design model for the new standards is unchanged from the previous one. That is, no targeting of individual vehicles – instead it is the average emissions from each manufacturer's annual fleet that counts. The target for each automaker depends linearly on the mass composition of all cars produced one year. Heavy vehicles are allowed to emit more than light vehicles.

However this weight-based model has been criticised for inhibiting producers from developing lighter cars with the same capacity as existing heavy models. Instead, a footprint (track width times wheelbase) model is suggested in which the area between the wheels should determine the emissions allowed. The Commission's impact assessment concludes that the footprint model is slightly more cost effective than a weight-based one, but the latter is still considered preferable to ensure "certainty for industry", but the conclusions are then ended: "a debate on a future change to footprint is desirable". The possibility to later shift to a footprint model is thus left open.

As with the previous standards, there are also exceptions to the general principle. The so-called "super credits" imply that cars (not vans) that emit less than 35 g/km (in practice, this means electric cars) will count as 1.3 cars, which leads to average emissions above the intended 95 g/km. Each manufacturer will be allowed to use 20,000 super credits in 2020-2023. This regulatory construction is meant to speed up technological innovation. Greenpeace calls it "an accounting trick", which will allow manufacturers to produce more of their most polluting cars.

The design of the fines system will also be the same as for the preceding period, i.e. €95 for each exceeding gram per kilometre and vehicle.

Car manufacturers producing fewer than 10,000 cars a year can, as previously, apply for individual goals. Companies that produce fewer than 500 cars a year get a complete exemption from the rules.

Kajsa Lindqvist

The new legislation will be amendments to the two existing regulations for CO_2 requirements for cars and vans (EC) No 443/2009 and (EU) No 510/2011)

New US fuel economy standards

The United States has adopted new fuel economy standards for cars and light-duty trucks, which will raise average fuel economy in 2025 to 54.5 miles per gallon, equivalent to 101 grams of CO_2 per km. The new legislation is a significant tightening of the previously approved standard for 2012-2016, which is projected to result in an average fuel consumption of 35.5 miles per gallon (equivalent to 155 grams CO_2 per km) in 2016.

The adopted US standard is not directly comparable with the corresponding EU standard as the latter distinguishes passenger cars from vans. The U.S. standard also differs from the EU standard in that it is based on the footprint and not on the weight of the vehicle.

Source: White house, press release 28 august 2012

Sea level rise already at 2-degree warming

Sea levels could rise significantly over the next few centuries, even if global warming is limited to 2 degrees, reaching between 1.5 and 4 metres above present-day sea level by the year 2300. The study, published in Nature and Climate Change, also shows that reducing emissions can have a significant impact on sea level rise. If global warming is limited to 1.5 degrees, sea level rise will also be limited to between 0.9 and 2.4 metres. And with a global warming of 3 degrees, sea levels are expected to rise in the range between 2 and 5 metres above present levels.

The rising sea level will have a significant impact. "As an example, for New York City it has been shown that one metre of sea level rise could raise the frequency of severe flooding from once per century to once every three years," says Stefan Rahmstorf co-author of the study.

Less global warming will also mean that sea level rise does not proceed as fast and this is very important for the people who live close to the sea. "Coastal communities have less time to adapt if sea levels rise faster," says Stefan Rahmstorf.

Source: Nature and Climate Change and the Potsdam Institute for Climate Impact Research

Ship emissions continue to increase

While air pollutant emissions from land-based sources in Europe keep on slowly shrinking, some reductions are countered by rising emissions from international shipping.

Since 1980, total European emissions of sulphur dioxide (SO_2) – the most significant acidifying pollutant and an important precursor to health-damaging secondary fine particles ($PM_{2.5}$) – from land-based emission sources have fallen by 85 per cent, from around 53 million tonnes in 1980 to 8.1 million tonnes in 2010.

Emissions of nitrogen oxides (NOx), non-methane volatile organic compounds (VOCs), and ammonia have also gone down, although to a lesser extent. VOCs have more than halved (-55 per cent) since 1980, while NOx and ammonia emissions have dropped by 44 and 34 per cent, respectively.

Since the late 1990s, emissions of primary fine particles ($PM_{2.5}$) have been attracting increasing attention, mainly because of their negative impacts on health. However, these emissions are not as well documented as those of other air pollutants, and many countries lack emissions data for the 1990s. Between 2000 and 2010 it is estimated that emissions of $PM_{2.5}$ from land-based sources have fallen by 18 per cent, from 2.8 to 2.3 million tonnes.

Emissions of NOx and SO_2 from international shipping in European waters show a steady increase. Since 1980, ship emissions of SO_2 have gone up from 1.7 to 2.4 million tonnes (a 37 per cent increase), and those of NOx from 2.4 to 4.0 million tonnes (64 per cent).

The data in Table 1 is taken from figures reported by countries themselves to the Convention on Long-range Transboundary Air Pollution, and was compiled by the European Monitoring and Evaluation Programme (EMEP). The Convention's EMEP keeps track of the ways in which emissions from one country affect the environment in others. The EMEP report also provides an overview of calculations for source-receptor relationships (including transboundary movements between countries), covering acidifying, eutrophying, photo-oxidant, and particle pollution.

For most European countries the biggest share of depositions of sulphur and nitrogen emanate from outside their own territory, and an increasing share of the depositions originate from international shipping.

Since land-based emissions are gradually coming down, while those from international shipping show a continuous increase, shipping's contribution to pollutant depositions and concentrations is getting bigger and bigger. For 2010 it was estimated that ship emissions were responsible for ten per cent or more of the total depositions of both sulphur and oxidised nitrogen compounds in many countries (see Table 2). In coastal areas, shipping's contribution to the overall pollution load is even higher. Countries that are particularly exposed to air pollution from shipping include Denmark, Sweden, Norway, the Netherlands, Ireland, Portugal and the United Kingdom.

Christer Ågren

Report: **Transboundary acidification, eutrophication and ground-level ozone in Europe in 2010**. EMEP Status Report 1/2011. *www.emep.int*

Table 2: European countries where the proportion of air pollutant depositions of sulphur and oxidised nitrogen from ships is the most marked.

Sulphur		NOx-nitrogen	
Denmark	28%	Denmark	26%
Netherlands	27%	Ireland	25%
Ireland	22%	Sweden	24%
Portugal	17%	Portugal	23%
France	16%	Norway	22%
Italy	16%	Netherlands	22%
Norway	15%	UK	21%
UK	15%	Spain	18%
Sweden	14%	Belgium	17%
Spain	13%	Italy	17%
Belgium	11%	France	16%

EU emissions inventories

A recent report from the European Environment Agency (EEA) confirms the initial assessment from earlier this year, showing 12 EU member states exceeded their binding limits under the National Emissions Ceilings (NEC) Directive in 2010.

Nitrogen oxide (NOx) limits were exceeded most frequently, with 12 countries – Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Luxembourg, Malta, the Netherlands, Spain and Sweden – failing to keep emissions below agreed ceilings.

Road transport contributes approximately 40 per cent of total NOx emissions in the EU, and reductions of NOx from this sector over the last two decades have been less than originally anticipated. This is partly because transport has grown more than expected, and partly because actual NOx emissions from diesel vehicles on the roads have turned out to be much higher than expected when the vehicle emission limit standards were set.

Better progress has been made in reducing sulphur dioxide (SO_2). Overall SO_2 emissions in the EU were more than 40 per cent below the EU's ceiling for this pollutant, and no member states exceeded their SO_2 ceiling.

Spain was the only member state to report exceeding three of its four emission ceilings (NOx, VOCs, ammonia), followed by Germany (NOx, VOCs) and Finland (NOx, ammonia) with two exceedances each.

In late July the EEA published another EU air pollutant emission inventory based on member states reporting to the Gothenburg Protocol under the Convention on Long-Range Transboundary Air Pollution (CLRTAP). Reporting under the CLRTAP and the NEC Directive can differ. For example, some countries have reported more recent data to the CLRTAP.

Reports: **NEC Directive Status Report.** EEA Technical report no. 6/2012.

European Union emission inventory report 1990–2010 under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP). EEA Technical report no. 8/2012. *www.eea.europa.eu*

Table 1: European emissions of sulphur dioxide, nitrogen oxides (as NO_2), VOCs, ammonia, and $PM_{2.5}$ (kilotonnes). Data for 2000 and 2010 is from the 2012 EMEP report, while data for 1980 and 1990 is from earlier EMEP reports. Russia in the table refers only to the western parts of the Russian Federation.

	sulphur dioxide				nitrogen oxides				VOCs				Ammonia				PM2.5	
	1980	1990	2000	2010	1980	1990	2000	2010	1980	1990	2000	2010	1980	1990	2000	2010	2000	2010
Austria	360	74	32	19	246	195	206	189	437	276	178	133	52	65	65	62	23	20
Belgium	828	361	172	67	442	401	332	221	274	315	206	105	89	120	86	69	34	17
Bulgaria	2,050	2,000	861	387	416	249	126	115	309	620	87	91	144	133	52	51	24	31
Cyprus	28	31	48	22	13	17	22	18	14	17	14	11	8	5	6	5	4	2
Czech Republic	2,257	1,876	264	170	937	742	321	239	275	374	227	151	156	157	74	69	28	20
Denmark	452	176	29	14	307	275	199	129	194	166	134	86	138	114	91	75	22	26
Estonia	287	274	97	83	70	74	38	37	81	70	46	38	24	25	10	10	21	24
Finland	584	262	79	67	295	323	201	167	210	239	168	116	39	38	37	37	39	41
France	3,214	1,354	644	262	2,024	1,865	1,602	1,080	2,734	2,589	1,712	852	795	703	699	645	368	255
Germany	7,514	5,289	653	449	3,334	2,882	1,925	1,323	3,224	3,128	1,391	1,053	835	692	602	548	143	111
Greece	400	473	495	264	306	329	362	322	255	268	264	184	79	85	71	64	49	63
Hungary	1,633	1,010	486	32	273	238	185	162	215	205	173	109	157	124	71	65	26	32
Ireland	222	182	140	26	73	121	135	76	111	93	73	45	112	107	113	106	11	8
Italy	3,440	1,795	749	210	1,585	2,014	1,421	963	2,032	2,015	1,607	1,080	441	468	449	379	178	173
Latvia	96	105	16	3	83	65	36	34	152	102	65	65	38	48	13	17	23	27
Lithuania	311	222	43	38	152	158	47	58	100	108	61	69	85	84	25	30	17	10
Luxembourg	24	15	3	2	23	39	45	46	15	19	12	9	7	5	6	5	3	2
Malta	26	29	24	8	9	14	8	8	2	8	3	3	5	1	2	2	1	1
Netherlands	490	192	73	34	583	566	398	276	579	477	238	151	234	355	161	122	24	15
Poland	4,100	3,210	1,511	974	1,229	1,280	838	867	1 036	831	599	662	550	508	322	271	135	137
Portugal	253	295	281	67	158	234	266	186	189	295	254	175	96	63	61	48	74	49
Romania	1,055	1,310	759	372	523	546	296	272	829	616	519	445	340	300	206	161	116	118
Slovakia	780	542	127	69	197	215	107	89	252	122	66	62	63	66	32	24	23	27
Slovenia	234	198	92	10	51	60	50	45	39	55	44	35	24	20	19	17	14	17
Spain	2,913	2,097	1,470	434	1,068	1,224	1,282	881	1,392	1,006	957	671	285	316	378	368	96	74
Sweden	491	105	42	34	404	269	205	161	528	359	223	197	54	55	59	52	28	32
United Kingdom	4,852	3,707	1,228	406	2,580	2,885	1,791	1,106	2,100	2,762	1,586	789	361	360	328	284	100	67
Sum EU27	38,894	27,184	10,418	4,523	17,381	17,280	12,444	9,070	17,578	17,135	10,907	7,387	5,211	5,017	4,038	3,586	1,624	1,399
Albania	72	78	39	21	24	22	21	24	31	43	23	28	32	28	29	24	9	11
Belarus	740	888	162	59	234	379	208	170	549	497	340	308	142	215	142	151	40	45
Bosnia & Herz.	482	484	420	431	79	73	53	51	51	48	40	43	31	21	17	17	20	19
Croatia	150	173	62	41	60	95	74	71	105	113	85	76	37	51	39	37	10	10
Iceland	18	21	35	72	21	27	27	22	8	12	7	5	3	3	3	3	1	0
Macedonia	107	110	90	83	39	46	39	29	19	21	25	25	17	15	14	10	9	9
Moldova	308	175	13	7	115	131	27	29	105	123	21	36	53	61	25	27	2	6
Montenegro	0	0	14	8	0	0	9	7	0	0	10	10	0	0	6	3	4	4
Norway	136	53	27	19	191	190	210	184	173	289	379	140	20	20	23	23	60	48
Russia	7,323	4,571	1,997	1,314	3,634	4,141	2,357	2,421	3,410	3,668	2,450	2,242	1,189	1,191	650	831	694	418
Serbia	406	593	210	277	192	165	149	200	142	158	122	138	90	74	82	82	18	31
Switzerland	116	42	16	13	170	145	110	79	323	289	144	89	77	73	66	63	12	10
Ukraine	3,849	3,921	1,599	1,216	1,145	1,753	871	603	1,626	1,053	641	357	729	682	485	187	289	276
Sum Non-EU	13,707	11,109	4,684	3,561	5,904	7,167	4,155	3,890	6,542	6,314	4,287	3,497	2,420	2,434	1,581	1,458	1,168	887
Sum Europe	52,601	38,293	15,102	8,084	23,285	24,447	16,599	12,960	24,120	23,449	15,194	10,884	7,631	7,451	5,619	5,044	2,792	2,286
Int. ship: Baltic Sea	139	168	188	99	215	236	276	333	5	8	10	13	-	-	-	-	22	15
Int. ship: Black Sea	35	45	56	71	52	62	81	98	1	2	3	4	-	-	-	-	6	8
I. ship: Mediterran.	725	858	1,068	1,329	1,000	1,234	1,562	1,903	21	41	53	69	-	-	-	-	124	155
Int. ship: North Sea	277	384	443	234	395	508	649	786	9	18	23	29	-	-	-	-	52	34
I. ship: N.E. Atlantic	550	384	494	628	772	565	723	874	15	19	24	31	-	-	-	-	57	73
Sum internat. ship.	1,726	1,839	2,249	2,361	2,434	2,605	3,291	3,994	51	88	113	146	-	-	-	-	261	285
Sum Europe + ships	54,327	40,132	17,351	10,445	25,719	27,052	19,890	16,954	24,171	23,537	15,307	11,030	7,631	7,451	5,619	5,044	3,053	2,571
Turkey	1,030	1,519	2,000	1,661	364	691	1,118	1,090	359	636	794	750	321	373	402	515	305	247

Make your voice heard on road charging!

The European Commission is considering harmonised rules on road charging for cars and has now opened a public consultation on the issue. A possible harmonisation could have an effect on the charge-collecting technologies used, methods for calculating tolls, and how fees are used.

The purposes of tolls are to internalise external costs for traffic as air pollution, congestion and noise as well as financing the maintenance and construction of the infrastructure itself. The Commission wants to know how citizens value the different purposes.

The Eurovignette Directive has since 1999 regulated road charges for heavy goods vehicles in the EU, but the equivalent for light vehicles is still lacking. Currently 14 member states have some form of road charging systems for cars, either in the form of tolls (distance-based) or vignettes (time-based).

The consultation will be open until 4 November.

http://ec.europa.eu/transport/road/consultations/2012-11-04-roadcharging_en.htm

WHO: Diesel exhaust causes lung cancer

Exhaust fumes from diesel engines can cause lung cancer, according to a thorough assessment by World Health Organization (WHO) experts. At a meeting in June, the International Agency for Research on Cancer (IARC), part of the WHO, reclassified diesel exhausts from its group 2A of probable carcinogens to its group 1 of substances that definitely are linked to cancer.

The decision came after a week-long meeting of independent experts who assessed the latest scientific evidence on the cancer-causing potential of diesel and gasoline exhausts.

The IARC working group found that diesel exhaust is a cause of lung cancer and also noted a positive association with an increased risk of bladder cancer.

Dr Christopher Portier, Chairman of the IARC working group, said in a statement that "the scientific evidence was compelling and the conclusion was unanimous: diesel engine exhaust causes lung cancer in humans. Given the additional health impacts from diesel particulates, exposure to this mixture of chemicals should be reduced worldwide".

Large populations all over the world are exposed to diesel exhaust every day. In its press release, IARC noted that people are exposed not only to motor vehicle exhausts but also to exhausts from other diesel engines, such as diesel trains and ships, and from power generators.

Squirrels united against cancer. FORTUN8 /FLICKR.COM / CC BY-ND

IARC's director, Christopher Wild, said that the decision to classify diesel engine exhaust as carcinogenic to humans "sends a strong signal that public health action is warranted," and that "this emphasis is needed globally, including among the more vulnerable populations in developing countries where new technology and protective measures may otherwise take many years to be adopted".

Gasoline exhaust fumes should according to IARC be classified as "possibly carcinogenic to humans", which is two risk categories below diesel exhaust, a finding that was unchanged from its previous assessment in 1989.

Source: WHO IARC press release No. 213, 12 June 2012: *http://press.iarc.fr/pr213_E.pdf*

Commission continues tough line on air quality

Over the summer, the European Commission has made decisions on numerous requests from member states for extra time to meet nitrogen dioxide (NO_2) standards. Fewer than half of the air quality zones concerned met conditions for an extension.

According to the EU's Air Quality Directive, member states can be permitted to delay for up to five years the 2010 deadline for meeting local NO_2 targets set in 1999. In order to get a derogation, member states must draw up and implement air quality plans with appropriate measures to ensure that the exceedance period can be kept as short as possible. The air quality plan has to show compliance with the limit value as soon as possible and at the latest by 2015.

In July, the Commission made decisions on applications from six member states. Only Finland's application, which relates solely to Helsinki, was approved in full. Italy, which submitted applications for 48 zones, was granted 18 extensions to 2015, three to 2013 and one to 2014. The rejected zones include Rome, Naples and Turin, none of which are expected to meet the targets by 2015.

Belgium was granted extensions for the port and city of Antwerp but refused one for Brussels, which is not expected to comply until 2018. Austria only won full extensions for Carinthia and Linz. Lower Austria must become compliant next year. The remaining six zones in its application, including Vienna and Salzburg, were refused extensions.

The Czech Republic was granted more time to meet the hourly limit in Prague, but the capital and three other zones did not win extensions to the annual limit, partly due to poor and inconsistent data. Spain's application for three extensions also failed.

In June, the EU executive approved a Latvian application covering Riga and one for the UK mainland. Gibraltar already has an extension.

Several other applications from member states are still under consideration by the Commission.

Source: ENDS Europe Daily, 19 July 2012

Twelve member states exceed NOx ceilings

Earlier analysis by the European Environment Agency that twelve member states exceed the limits of the NEC Directive is now confirmed by the countries' own preliminary data for 2010. NOx is the recurring problem for all countries that exceed emission ceilings. Three countries also fail with additional emission ceilings: Spain (NMVOC and NH_3), Germany (NMVOCs) and Finland (NH_3). Final data for 2010 will be reported by the end of this year.

Source: European Environment Agency, *http://bit.ly/MY6q8Q*

Harmful air pollutants strike Europeans

A new report by the European Environment Agency (EEA) shows that many parts of Europe have persistent problems with outdoor concentrations of airborne particulate matter (PM) and ground-level ozone. Almost a third of Europe's city dwellers are exposed to excessive concentrations of PM.

In 2010, one fifth of the urban population was exposed to PM_{10} levels higher than the EU daily limit value designed to safeguard health. Some 90-95 per cent of urban dwellers were exposed to $PM_{2.5}$ concentrations that exceed the (stricter) reference values set by the World Health Organization (WHO) for the protection of human health.

Ozone can cause respiratory health problems and lead to premature mortality. Exposure in cities is very high – 97 per cent of EU urban inhabitants were exposed to ozone concentrations above the WHO reference level in 2010. Moreover, in 2009, 22 per cent of arable land in Europe was exposed to damaging concentrations of ozone, leading to agricultural losses.

European Environment Agency: *http://bit.ly/Pde9kA*

Public consultation on urban transport

In conjunction with the opening of this year's European Mobility Week this Monday the European Commission launched a public consultation on sustainable urban transport and mobility that will be open until 17 December.

The EU Commission wants to know what citizens think about the possibility of setting up a framework and support structure for Sustainable Urban Mobility Plans. Under consideration is also the possibility to make Sustainable Urban Mobility Plans a requirement for cities to have access to regional development and cohesion funds.

Janez Potočnik, European Commissioner for the Environment, said: "Sustainable Urban Mobility Planning is a way to balance transport development, environmental quality and social equity. Better planning can help cities benefit from greater mobility as well as better air quality, reduced emissions, less noise and a healthier urban environment."

The consultation also raises the issue of harmonisation of urban access restriction schemes, which is a collective term for low emission zones, green zones and congestion charging zones. How to manage and reduce emissions from urban freight is yet another area where the European Commission wants citizens comments.

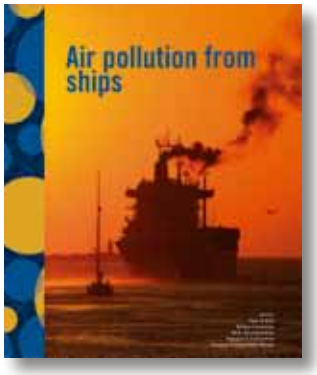
http://ec.europa.eu/transport/urban/consultations/2012-12-10-urban-dimension_en.htm

Recent publications from the Secretariat

Reports can be downloaded in PDF format from *www.airclim.org*

For Clean Air Everywhere

A new brochure from Transport & Environment, European Environmental Bureau and AirClim. Target readers are regional and local decision makers, local authorities, environmental organisations and the interested general public. It starts off with a short guide to the effects of major air pollutants on human health, recommended guidelines and current EU standards. Followed by twelve practical steps for cleaner air in our cities.



Ship emissions

Shipping is a major cause of harmful air pollution in Europe and by 2020 shipping emissions of SO_2 and NOx could exceed the emissions of these pollutants from all other EU sources.

This pollution must be reduced dramatically to protect health and the environment and to make shipping a more sustainable form of transport.

Technical measures exist that could cut the level of pollution from ships by at least 80-90 per cent and doing so would be much cheaper than cutting the same amount from land-based sources.

Boreal Forest and Climate Change

The fate of the vast boreal forest belt of the northern hemisphere is crucial for global climate. Regional perspectives on this issue are given in "*Boreal Forest and Climate Change - regional perspectives*" (by Roger Olsson, April 2010). The expected rate of warming varies considerably within the Arctic region, as does the state of the forest. This means that the possible climate effects - and the possibilities to mitigate them - will be different.

Our possibilities to protect and manage these forests for climate mitigation are presented in "*To Manage or Protect*" (by the same author, October 2011). Turning old-growth boreal forest into managed forest has a negative impact on climate in the short and medium term. Reducing consumption of paper and using more of the harvested wood for timber and fuel would be one option.

Subcribe to *Acid News* via email

Are you receiving the printed copy of *Acid News* but missing out on the online version? Sign up on our website to receive an email announcement when each issue of *Acid News* becomes available online.

This way, you'll get access to *Acid News* at least two weeks before the printed copy arrives in the mail.

airclim.org/acidnews/an_subscribe.php

Coming events

IMO Marine Environment Protection Committee (MEPC). London, UK, 1 - 5 October 2012. Information: *http://www.imo.org*

European Transport Confrence 2012. Glasgow, Scotland, 8-10 October 2012. Information: *http://www.aetransport.org*

Worlds within reach – from science to policy. IIASA 40th Anniversary Conference. Luxenburg, Austria, 24 - 26 October 2012. Information: *http://www.iiasa.ac.at/conference2012/*

Local Renewables Freiburg 2012. Freiburg, Germany, 25-26 October 2012. Information: *http://www.local-renewables-conference.org/*

European Electric Vehicle Congress 2012. Brussels, Belgium, 19-22 November 2012. Information: *www.eevc.eu*

19th International Transport and Air Pollution Conference (TAP). Thessaloniki, Greece, 26 - 27 November 2012. Information: *http://tapconference.org/*

UN FCCC Conference of the Parties (COP) 18. Doha, Quatar, 26 November - 7 December 2012. Information: *http://unfccc.int/*

Better Air Quality. Hong Kong, 5 - 7 December 2012. Information: *http://www.baq2012.org/*

CLRTAP Executive Body. Geneva, Switzerland, 11 - 13 December 2012. Information: *www.unece.org/env/lrtap/*

EU Environment Council. Brussels, Belgium, 19 December 2012. Information: *http://europa.eu/newsroom/calendar/*

World Biofuels Markets Congress & Exhibition. Rotterdam, The Netherlands, 12 - 14 March 2013. Information: *www.worldbiofuelsmarkets.com*

Air Quality and Emissions 2013. Telford, United Kingdom, 13 - 14 March 2013. Information: *www.aqeshow.com*

European Climate Change Adaptation Conference. Hamburg, Germany, 18 - 20 March 2013. Information: *http://eccaconf.eu/index.php/page/ECCA*

International Conference on Arctic Ocean Acidification. Bergen, Norway, 6 - 8 May, 2013. Information: *www.amap.no*

4th International EFCA-symposium on Ultrafine Particles. Brussels, Belgium, 16 - 17 May 2013. Information: *www.efca.net*

21st International Conference on Modelling, Monitoring and Management of Air Pollution. Siena, Italy, 3 - 5 June, 2013. Information: *http://www.wessex.ac.uk/13-conferences/air-pollution-2013.html*