

Reviewing the Large Combustion Plant BREF

The reference documents for best available techniques (BAT) for large combustion plants are under review. New issues such as oil shale and firing of high-sulphur coal will be considered.

► Page 7

The Kyoto Protocol worth fighting for

Why do we need legally binding treaties? What about other big emitters, such as the US and China? What if there is no agreement in Durban?

► Page 8

Tipping point for disintegration?

The West Antarctic Ice Sheet has started to show signs of instability: ice shelves the size of European countries have broken off from coastal areas.

► Page 12

Serious air quality problems in Europe

Between 80 and 90 per cent of the EU urban population is exposed to levels of harmful particulate matter (PM₁₀) exceeding the air quality guideline set by the World Health Organization.

► Page 16

EU trends for greenhouse gas emissions

Macro-economic factors have been the biggest influence on changes in greenhouse gas emissions in the EU over the past two decades.

► Page 18

Coal is dirty and costly

Economic analysis of the costs of air pollution damage to the US shows that coal-fired power generation is under-regulated and incredibly costly.

► Page 20



© LARS-ERIK HAKANSSON

New standards save lives

Implementing the stricter ship fuel sulphur standard of 0.1 per cent in the Baltic Sea and the North Sea, is estimated to save up to 16,000 lives per year in the EU in 2020.

In July, the European Commission proposed to align EU legislation on ship fuel sulphur with the new international standards adopted by the International Maritime Organization (IMO) in 2008, a proposal that is now being debated in the European Parliament and the Council.

Concerns about the new standards have been raised by various industry

groups, primarily over the perceived high implementation costs of the 0.1 per cent sulphur limit that will apply in designated sulphur emission control areas (SECA) from 2015. At present only two European sea areas, the Baltic Sea and the North Sea

Page 3 ►

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: Christer Ågren
Assistant editors: Reinhold Pape and
Kajsa Lindqvist

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

In 2008, after twenty years of talks but very little action, the International Maritime Organization (IMO) finally agreed on sulphur standards that will significantly reduce the well-documented adverse health and environmental impacts of shipping.

The decision was unanimously adopted by 95 Parties to the IMO, including the 22 EU member states present, and it became legally binding when it entered into force on 1 July 2010.

In order to incorporate new IMO standards into EU law and to ensure their proper and harmonised enforcement by all EU member states, the European Commission proposed on 15 July 2011 legislation to revise the existing directive on the sulphur content of certain liquid fuels.

A group of European industry and shipowner organisations has strongly criticised the Commission's proposal, however, especially the 0.1 per cent sulphur standard that shall apply in designated Sulphur Emission Control Areas (SECAs), namely the Baltic Sea and the North Sea, from 2015.

Usually industry favours international agreements, especially when it comes to sectors of a global nature, such as shipping and aviation. This is due partly to a perceived need for harmonisation, but also because it normally takes decades to settle such agreements and the standards arrived at are often set at very low levels of ambition.

From this perspective, it would be logical for industry to embrace the IMO standards, rather than criticise them, and to welcome the Commission's proposal to ensure a harmonised enforcement. But instead these industry groups are calling on EU policy-makers to postpone or even ignore the IMO agreement.

Attempts to weaken the global IMO agreement would be in vain and would

surely also seriously undermine the credibility of the EU and the member states in IMO and in any other international treaties. In July 2010, the European Commission's President Barroso rather politely stated to the complaining industry group that he "does not believe it is a realistic option to call into question the agreement that has been reached at international level."

The nature of shipping as an international business has been used as an excuse or manoeuvre to delay environmental action

for too long, and it is not acceptable for the shipping industry to keep on transferring the cost of its pollution to society at large.

Several studies, including the Commission's cost-benefit analysis for the proposed directive, have demonstrated that reducing ship emissions would be cost-effective in itself, as well as economically profitable for society. Just implementing the SECA standard is estimated to save some 12,000 lives

per year in 2015, rising to 16,000 lives per year in 2020. Clearly, as an absolute minimum, the IMO regulations must be fully implemented.

To ensure an organised gradual phase-in of low-sulphur fuels, to encourage the use of the best techniques, and to speed up the introduction of cleaner fuels and ships, the mandatory environmental standards need to be complemented by economic instruments, such as emission charges.

Moreover, the EU and its member states should follow the example of the United States and Canada and designate all sea areas around Europe (the Baltic Sea, the North Sea, the North-East Atlantic, the Mediterranean and the Black Sea) as "full" Emission Control Areas, i.e. covering all the major air pollutants (sulphur, particulate matter and nitrogen oxides).

Christer Ågren

"It is not acceptable for the shipping industry to keep on transferring the cost of its pollution to society at large"



New standards save lives

Continued from front page

(including the English Channel), have such SECA status. (See Box.)

When this new SECA limit of 0.1 per cent sulphur comes into effect in 2015, emissions of sulphur dioxide (SO₂) from international shipping in the Baltic Sea and the North Sea are expected to come down by more than 90 per cent, and those of primary particulate matter (PM) to shrink by 80-90 per cent. Emissions of nitrogen oxides (NO_x) are not expected to be markedly influenced by the fuel standards as such. (See Table.)

Expressed in absolute figures, annual SO₂ emissions in these two sea areas are projected to be cut by 466,000 tonnes in 2015, and by 528,000 tonnes in 2020. The overall emission reduction over the five-year period 2015-2020 would thus add up to approximately 2.5 million tonnes of SO₂, equalling more than eighty times the current total national SO₂ emissions from Sweden.

Through chemical reactions in the air, SO₂ and NO_x are converted into very small airborne particles, sulphate and nitrate aerosols, which are linked to premature deaths. A recent Danish study estimated the number of premature deaths in Europe caused by air pollutant emissions from international shipping to amount to approximately 50,000 per year.

According to the cost-benefit analysis prepared for the Commission, implementation of the SECA limit is calculated to reduce the number of annual premature deaths due to PM_{2.5} in the EU's 27 member countries by 12,000 cases in 2015 and by more than 16,000 cases in 2020 (see AN 3/10).

In addition to health impacts, emissions of SO₂ are the main cause of acidification, severely affecting the biodiversity of freshwater as well as terrestrial ecosystems. In 2000, deposits of acidifying air pollutants exceeded the safe limits (critical loads) for acidifying substances over 280,000 square kilometres (22%) of sensitive forest ecosystems in the EU. Most of the affected areas are located in the northern parts of Europe and are highly impacted by emissions from shipping in the SECA areas.

Emission control areas – background

It was back in the 1980s that Sweden and Norway brought the issue of ship air pollutant emissions, especially those of sulphur dioxide, to the attention of the United Nations International Maritime Organization (IMO). After nearly ten years of negotiation, agreement was reached in 1997 to add an air-pollution annex (Annex VI) to the IMO's marine pollution (MARPOL) Convention. The annex came into force in 2005, and set a global cap of 4.5% on the sulphur content of marine fuel oil. For comparison, the global average ship fuel sulphur content is around 2.5 – 3%, a level that has stayed more or less constant for at least twenty years.

Annex VI also established provisions for the designation of special sulphur emission control areas (SECAs) with more stringent control on sulphur emissions. For these areas, a limit on the sulphur content of fuel used onboard ships was set at 1.5%. Alternatively, ships could fit an exhaust gas cleaning system (scrubber) or use other methods to limit their SO₂ emissions. The Baltic Sea was the first SECA to enter into effect in 2006, followed by the North Sea in 2007.

Moreover, Annex VI set limits on the emissions of NO_x from new ship engines from the year 2000, but these first NO_x standards were so weak that in practice they did not have any appreciable effect.

According to the Commission, the cost to the shipping industry of the new SECA limit is expected to amount to between €0.6 billion and 3.6 billion per year in 2015 – the upper bound assumes a fuel switch to lower-sulphur distillates, while the lower bound of costs is based on ships fitting exhaust cleaning techniques (scrubbers).

However, these costs are far outweighed by public health savings of up to €16 billion per year in 2015. According to the Com-



mission's Impact Assessment, the health benefits associated with implementation of the SECA limit amount to at least between €5 and €25 for every €1 spent. In addition, there are significant benefits associated with environmental improvements, such as reduced acidification of ecosystems and less damage to buildings and cultural monuments.

In March 2009, the United States and Canada applied to the IMO to have their coastal waters out to 200 nautical miles (370 kilometres) designated as a combined sulphur and NO_x emission control area. The North American ECA entered into force in August 2011. Consequently, the 0.1% SECA limit will also apply here as from 2015. IMO's revised MARPOL Annex VI entered into force on 1 July 2010, which means that the new emission standards are already binding.

New standards save lives

Continued from previous page

As regards the costs and the perceived risk of a modal shift from shipping to other means of transport, the European Maritime Safety Agency (EMSA) has analysed the findings of eight different studies (published in 2009 and 2010) on the impacts of implementing the 2015 SECA standard.

EMSA found that assumptions on the expected future price vary widely between the different studies, mostly ranging between US\$500-900 per tonne. A price at the higher end of this range would imply a price difference (compared to 1 per cent sulphur HFO) of about 60 per cent.

Five of the eight studies tried to assess the effect of the increased fuel costs for shipping on the total transport costs, and the potential for modal shift from shipping to rail and road. EMSA concludes that there are certain risks for such a modal shift, but “only within certain limited routes and under certain (high-end) fuel price scenarios.”

It is further concluded that if the price for low sulphur fuel stays around the levels predicted in most studies, “short sea shipping will remain competitive towards other modes even if volumes will be lost”, and that if the fuel price reaches levels around US\$1,000 per tonne, “the effects will be more severe but still many short sea shipping routes will remain competitive.”

It is remarkable that only one of these five studies also takes into account the cheaper alternative abatement options available. Not surprisingly, this study found that where scrubbers were assumed to be applied

by ship operators, the compliance costs were much reduced, so there would be almost no risk of modal shift.

Perhaps even more remarkable is that none of the studies appear to assume that ships will take measures to reduce fuel consumption, in spite of the fact that increased fuel prices will make a number of available operational and technical measures to reduce fuel consumption cost-effective. For example, a study on policy measures to reduce greenhouse gas emissions from ships found that at a ship fuel price of US\$700 per tonne, it would be cost-effective (in this context meaning that savings would outweigh costs) to reduce fuel consumption by 31 per cent.

One obvious way to reduce fuel consumption is to reduce speed – an option that would simultaneously cut costs and reduce emissions of air pollutants, including the main greenhouse gas, carbon dioxide.

Responding to industry concerns over increased costs, the Commission presented in September a paper outlining a number of measures aimed at minimising the compliance costs, including various type of financial support (see AN 3/11).

The Commission has made it clear that a delay in the 2015 SECA limit – as has been suggested by some industry



groups – is not an option, neither at EU level nor attempting to push for a delay at the IMO.

Interestingly, the overwhelming majority of respondents to the Commission’s public consultation wanted more European sea areas to be designated as SECAs, as this would both bring much needed health and environmental benefits and address intra-sectoral competition issues.

While the Commission agrees that such an extension of the SECA coverage is likely to offer net benefits and address competitiveness concerns, it states that any such proposals to the IMO must come from member states bordering the sea area in question. The same applies to designation of nitrogen oxides (NOx) Emission Control Areas, of which there are currently none in Europe.

On the other hand, there is nothing to prevent the EU from establishing emission standards for all ships entering EU ports, for example a standard equivalent to the 0.1 per cent SECA sulphur limit, that could be included in the revised EU directive on sulphur in fuels. Legally, the standard could also be made mandatory in the non-SECA sea areas and apply to ships in EU territorial waters, and likely also within the exclusive economic zones.

Christer Ågren

Table. Emissions of SO₂ and NO_x in the Baltic Sea and the North Sea in the year 2000 and projections for 2015/2020 assuming no implementation of the 2008 IMO standards (Baseline) or full implementation (IMO). (tonnes)

	SO ₂	Change from 2000	NO _x	Change from 2000
2000	594,000		947,000	
2015 Baseline	500,000	-16%	1,470,000	+55%
2015 IMO ¹	34,000	-94%	1,220,000	+29%
2020 Baseline	568,000	-4%	1,669,000	+76%
2020 IMO ¹	40,000	-93%	1,090,000	+15%

¹ Assumes a NO_x emission control area (NECA), i.e. Tier III NO_x standards for all new ships from 2016. Source: AEA Technology (2009)

The Commission’s proposal and impact assessment can be found at: http://ec.europa.eu/environment/air/transport/ships_proposal.htm

Call to extend stricter fuel standards

A ship fuel sulphur limit of 0.1 per cent should be extended to apply to all territorial waters of EU member states up to 12 nautical miles (22 km) from their coasts, according to Finnish MEP Satu Hassi, the European Parliament's rapporteur on the sulphur-in-fuels directive.

Under the international standards adopted by the International Maritime Organization (IMO) in 2008, the 0.1 per cent sulphur limit will apply only in designated Sulphur Emission Control Areas (SECAs), and so far SECAs in Europe are limited to the Baltic Sea and the North Sea, including the English Channel.

In July, the European Commission presented a proposal to revise the directive regulating sulphur in petroleum fuels, primarily to align EU legislation on ship fuel sulphur with the 2008 IMO standards.

The rapporteur welcomes and supports the Commission's proposal, and stresses that the IMO standards will apply even if no new EU legislation is enacted. However, she points out that the directive could clarify and standardise the implementation and monitoring of the IMO standards, level the playing field for competition, facilitate the transition stage and encourage innovations.

But the Commission's proposal does not go far enough, Hassi argues. Apart from extending the 0.1 per cent sulphur limit to all territorial waters, she proposes that the 0.1 per cent sulphur limit for passenger ships should come into force from 2015, i.e. at the same time as this limit

will apply in SECAs. The Commission wants the passenger ship limit to apply only from 2020.

"These amendments would make it possible to achieve significant health and environmental benefits and would also

create a level playing field as regards the cost impacts of reform," Hassi writes in the draft report.

Hassi also wants the Commission to explore, by the end of 2013, the establishment of new sulphur and nitrogen oxide emission control areas in Europe, as well as methods for further reducing emissions.

Moreover, she proposes the facilitation of the use of state aid for investment, because she believes that "during the transition period some operators will have to bear significant additional costs, particularly in the case of journeys undertaken mainly or largely in SECAs".

The granting of more state aid is justified, she says, since cutting ships' air pollutant emissions will provide "major economic benefit for the public sector owing to the accompanying reduction in health expenditure".

The draft parliament report, prepared by Hassi, was presented to the parliament's environment committee on 22 November, and a vote in the committee is scheduled for 24 January.

Christer Ågren

The draft report can be downloaded from: http://www.europarl.europa.eu/meet-docs/2009_2014/documents/envi/pr/882/882049/882049en.pdf



Satu Hassi proposes that the 0.1 per cent sulphur limit for passenger ships should come into force from 2015, i.e. at the same time as this limit will apply in SECAs.

Ship fuel efficiency cuts costs

Emissions of carbon dioxide (CO₂) from international shipping worldwide are projected to increase from 870 million tonnes to between 2000 and 3200 million tonnes (by a factor of 2.3 to 3.7) from 2007 levels by the year 2050 under business-as-usual scenarios.

A recent study commissioned by the International Maritime Organization (IMO) has investigated the impact of energy efficiency measures agreed by the IMO earlier this year. It estimates that these measures could reduce emissions by 35–40 per cent below the business-as-usual (BAU) levels by 2050, but also that absolute emissions will continue to grow.

The measures assessed are the energy efficiency design index (EEDI), to be in-

troduced for new ships built after January 2013, and a wider requirement to develop ship energy efficiency management plans (SEEMPs) for all vessels. The regulations apply to all ships of 400 gross tonnage and above, and are expected to enter into force internationally on 1 January 2013.

By 2020, an average of 150 million tonnes (Mt) of annual CO₂ reductions are estimated from the introduction of these measures, a figure that by 2030 will increase to 330 Mt. Compared to BAU, annual reductions in CO₂ emissions and fuel consumed are estimated at between 13 and 23 per cent by 2020 and 2030, respectively.

These reductions translate into annual fuel cost savings of about US\$50 billion in

2020 and about US\$200 billion by 2030; using fuel price increase scenarios that take into account the switch to low-sulphur distillate fuel in 2020.

Despite the emission reduction potential resulting from EEDI and SEEMP regulations, the authors conclude that an absolute reduction in shipping's total CO₂ emissions from the 2010 level appears not to be feasible with these two measures alone. For all scenarios, the projected growth in world trade outweighs the achieved emission reduction.

Source: IMO press release, 14 November 2011

Assessment of IMO mandated energy efficiency measures for international shipping. Estimated CO₂ emission reductions from the introduction of mandatory technical and operational energy efficiency measures for ships. Report MEPC 63/INF.2 (31 October, 2011). By Lloyd's Register and DNV. Available at: www.imo.org

Lower global ship sulphur limit

The global marine fuel sulphur limit required under IMO's MARPOL Annex VI will be reduced from 4.50 per cent to 3.50 per cent as of 1 January 2012.

Sulphur monitoring data compiled by the International Maritime Organization (IMO) for 2010 showed that the average sulphur content for heavy fuel oil (HFO) tested in that year was 2.61 per cent. It also showed that nearly 15 per cent of the HFO samples tested in 2010 were above the forthcoming global 3.50 per cent sulphur limit.

Source: Sustainable Shipping News, 1 November 2011



Green shipping in a nutshell.

GHG concentrations continue climbing

In 2010, levels of greenhouse gases in the atmosphere reached a new high since pre-industrial time and the rate of increase has accelerated, according to the World Meteorological Organization (WMO).

Between 1990 and 2010, there was a 29 per cent increase in radiative forcing – the warming effect on our climate system – from greenhouse gases (GHG), with carbon dioxide (CO₂) accounting for 80 per cent of this increase.

CO₂ is the single most important man-made GHG and contributes about 64 per cent to the total increase in climate forcing. Since the start of the industrial era in 1750, its atmospheric abundance has increased by 39 per cent to 389 parts per million (ppm), primarily because of emissions from combustion of fossil fuels, deforestation and changes in land use.

Between 2009 and 2010, CO₂ concentrations increased by 2.3 ppm – higher than the average for both the 1990s and the past decade.

Methane (CH₄) has contributed about 18 per cent to the increase in radiative forcing since 1750 and is the second most important GHG. Since 1750, it has increased by

158 per cent, mostly because of activities such as cattle-rearing, rice planting, fossil fuel exploitation and landfills.

Nitrous oxide (N₂O) has contributed about six per cent to the increase in radiative forcing since 1750, and is the third most important GHG. The atmospheric burden of N₂O is now 20 per cent higher than in the pre-industrial era, mainly as a result of the use of nitrogen-based fertilisers, including manure, which has profoundly affected the global nitrogen cycle.

The combined radiative forcing by halocarbons is 12 per cent. Some halocarbons such as chlorofluorocarbons (CFCs) are decreasing slowly as a result of international action to preserve the Earth's protective ozone layer. However, concentrations of other GHGs such as HCFCs and HFCs, which are used as substitutes for CFCs because they are less damaging to the ozone layer, are increasing rapidly. These two classes of compounds are very potent greenhouse gases and last much longer in the atmosphere than CO₂.

Source: WMO, 21 November 2011

Web link: http://www.wmo.int/pages/mediacentre/press_releases/pr_934_en.html

Reviewing the Large Combustion Plant BREF

The reference documents for best available techniques (BAT) for large combustion plants are under review. New issues like oil shale, firing of high-sulphur coal and greenhouse gases such as nitrous oxide and sulphur hexafluoride will be considered.

2011 has seen the start of the review process for the Large Combustion Plant (LCP) BREF. BREFs (BAT Reference Documents) are large technical documents, originally produced under the Integrated Pollution Prevention and Control (IPPC) Directive to assist the writing of industrial permits for individual installations. This legislation has now been replaced by the Industrial Emissions Directive (IED), and the LCP BREF review is the first to take place wholly under this new legislation.

BREFs set out the EU benchmark standards for Best Available Techniques (BAT) for each industrial sector or cross-sector issue, and under the IPPC Directive they were provided as guidance for permit writers. However, under the IED, their status has been upgraded to provide the reference for regulators, with derogations from the BREF BAT standards only being allowed if a public justification is made on the basis of particular local factors specified in the legislation.

The LCP BREF review has attracted a lot of attention, resulting in an abnormally large Technical Working Group (TWG) of nearly 140 representatives of member states, industry and environmental NGOs. This large representation produced nearly 2400 proposals for revision during the submission of wish lists from TWG members earlier this year.

These wishes were integrated into a background paper for discussion at the Kick-off Meeting of the TWG that took place in Seville at the end of October. Over a three-day period, the meeting reached conclusions on a range of issues, including the scope and structure of the BREF. Here, for example, it was decided



BATs need to be updated once in a while.

to keep co-incineration of waste within the BREF, but to add a new chapter on gasification/pyrolysis/liquefaction. This will appear alongside chapters for each of solid, liquid and gaseous fuels, within which multi-fuel combustion will be included. Carbon capture will also be formally covered, possibly as part of a wider section on emerging techniques.

The revised BREF will also lay greater emphasis on cross-reference to other relevant BREFs, both to avoid duplication and to increase the legibility of the series of BREFs taken as a whole.

The revision process only addresses those parts of the existing BREF where modification and/or updating are judged necessary. These include not only revisiting the sections on mercury, biomass, etc., to take account of recent technical developments, but also considering new issues as appropriate e.g. oil shale, firing of high-sulphur coal and greenhouse gases such as nitrous oxide and sulphur hexafluoride. Data is also to be collected to determine whether there is a case for setting BREF BAT standards for modes of operation

other than base load e.g. for mid-merit, peak and emergency loads.

Given the new guidance currently being developed to assist the BREF process¹, the design of a plant data collection questionnaire and the methodology for processing the data are important parts of the review process. A sub-group is to be formed to finalise the draft questionnaire, and member states are to nominate reference plants with good environmental performance within each sub-category to receive the questionnaire, together with a rationale for their selection.

This data collection process is scheduled until the end of May 2012, after which the first draft of the revised BREF is expected by the autumn of 2012, with comments to be received by January 2013. This will be followed by a second draft and a further round of comments by the autumn of 2013. A final meeting of the TWG is scheduled to take place in Seville in the spring of 2014, with the revised BREF being available for presentation to a Forum meeting in the autumn. The formal process of adopting the BAT conclusions determined in the review process will follow that.

Lesley James,
representing the European Environmental
Bureau in the review of the LCP BREF.

¹ **GUIDANCE DOCUMENT on the practical arrangements for the exchange of information under the Industrial Emissions Directive (2010/75/EU)**, including the collection of data, the drawing up of best available techniques reference documents and their quality assurance as referred to in Article 13(3)(c) and (d) of the Directive



The Kyoto Protocol – a treaty worth fighting for

Questions and answers about the Kyoto Protocol by Climate Action Network Europe

Detail of poster from the tckctck campaign.

1. Why do we need legally binding treaties and especially the Kyoto Protocol?

A top-down process is essential to ensuring that global mitigation efforts match the urgency of reducing global climate risks. Only a multilateral binding regime can incentivise adequate ambition. Without a doubt the Kyoto Protocol has been critical for the exponential growth in renewable energy investment over the past decade.

The Kyoto Protocol provides a benchmark for a global legally binding instrument for all. Currently the international negotiations are running on two tracks, one for the Kyoto Protocol and one for a new

treaty that would include all the world's major emitters, including the USA and China. An end to the Kyoto Protocol would make the negotiations collapse into a single track, putting the progress blockers in the driver's seat. Abandoning the capstone of the current international climate regime could seriously limit future ambition and make a voluntary bottom-up pledge and review system the dominant outcome.

2. Why is the Kyoto Protocol important in Durban?

The first commitment period of the Kyoto Protocol expires at the end of 2012, which

is intensifying negotiations on reaching agreement on legal form at the UN climate conference in Durban in December 2011. Securing a second commitment period of the Kyoto Protocol, and thus preserving the only legally binding instrument with emission reduction targets and timetables, has been identified as the key outcome of Durban by vulnerable and developing countries, as well as the emerging economies' BASIC group. It has also been identified as the key question to be resolved in Durban by the incoming COP17 South African presidency and the UNFCCC executive secretary, Christina Figueres.

3. Why is the EU critical for securing the Kyoto Protocol's future?

CAN Europe is convinced that the European Union is central in shaping the direction of the global climate change regime, especially if it is able to lead from the front and set the agenda – by unilaterally adopting clear, ambitious positions, well in time.

CAN Europe believes that it is in the EU's own interest to work tirelessly to preserve the legal *acquis* embodied in the Kyoto Protocol's basic architecture. The Kyoto Protocol was a major success for European climate diplomacy, which took years to negotiate, refine and ratify. The Kyoto Protocol also embodies an emotional legacy within the climate negotiations. Saving it is therefore a core priority for developing countries and key elements of the Kyoto Protocol's architecture remain important for progressive developed countries.

Agreeing to a second commitment period requires very little from the EU. The EU's own climate and energy legislation already covers the EU's climate commitments until 2020. At present there are increasing expectations by developing countries that the EU should be able to cooperate on a second commitment period. On the other hand, some developed countries (Russia, Canada and Japan) have signalled that they would be unwilling to put forward targets for a second commitment period post-2012. Therefore, without an unambiguous and concrete commitment from the EU, the future of the Kyoto Protocol – and of the multilateral UNFCCC regime – is in danger.

The only way the EU can put pressure on the largest emitters is to build an inclusive movement among the majority of the world's countries; the EU cannot do this if it abandons the Kyoto Protocol.

4. What about other big emitters, such as the United States and China, that are not parties to the Kyoto Protocol?

By using the Kyoto Protocol as an effective lever, the EU can shift the spotlight back onto the other big emitters.

In Durban, to complement an agreement to a second commitment period of the Kyoto Protocol, governments must also agree a negotiating mandate with a timetable for a global legally binding instrument that also includes countries, that are not currently included in the Kyoto Protocol. The new agreement should be consistent with the latest science, taking into account the equity principles of the UNFCCC and the historical responsibility of developed countries.

This must be done in order to put us on a credible pathway towards global emission reductions of at least 80 per cent by 2050, as required to fall in line with the scientific consensus on avoiding runaway climate change. This instrument should be adopted no later than 2015 and enter into force by the end of the second commitment period of the Kyoto Protocol.

5. What if there is no agreement to adopt a second commitment period of the Kyoto Protocol in Durban?

Currently there is no alternative to a Kyoto Protocol regime.

The Kyoto Protocol provides the criti-

cal architecture needed to for an effective global climate regime (see box). It contains all the necessary elements for monitoring, compliance, finance, technical cooperation and economic efficiency. There is no magic institutional structure waiting to be discovered that isn't already contained in – or compatible with – a reformed version of the Kyoto Protocol. If the most dangerous effects of climate change are to be averted, there is no time left to start from scratch again.

A decision to adopt a second commitment period at COP17 in Durban allows the governments only 12 months to ensure there will be no gap in developed countries' legally binding commitments.

Waiting until COP18 at the end of 2012 to agree on the continuation of the Kyoto Protocol would result in a legal gap and would not allow for any options other than relying fully on a provisional application that does not ensure legal obligation.

6. What is EU's position on the Kyoto Protocol?

The EU suffered a diplomatic failure ahead of the Copenhagen COP15 conference by communicating its strong preference for a single-track outcome, resulting in many developing countries blaming the

Some important architectural elements of the Kyoto Protocol:

- ✱ **Long-term viability:** the KP provides a framework that can be updated for each commitment period, while maintaining its essential elements.
- ✱ **Top-down approach:** setting an overall objective – an aggregate goal – for developed countries, allowing appropriate consideration of science and equity (including the Common but Differentiated Responsibilities [CBDR] principle). Comparability of effort between developed countries is established through their respective targets (Article 3.1).
- ✱ **Legally binding, economy-wide, absolute emission reduction targets for developed countries,** expressed as a percentage below the 1990 base year (Annex B).
- ✱ **System of 5-year commitment periods,** with comparability of effort measured against a common 1990 base year (Articles 3.1 and 3.7).
- ✱ **Monitoring, review and international verification system** (Articles 5, 7, 8 and associated decisions).
- ✱ **Compliance mechanism,** composed of two tracks – facilitative and enforcement (Article 18).
- ✱ **Mandatory review of provisions** of the Protocol for subsequent commitment periods (Article 3.9).
- ✱ **Supplementarity of external action** (ie CDM) to domestic actions (Article 6.1d).
- ✱ **Required reporting on "demonstrable progress" for developed countries,** establishing an important reporting requirement and stocktaking (Article 3.2).
- ✱ **Basket approach to greenhouse gases** (GHGs) and the ability to list new gases and classes of gases (Annex A).
- ✱ **Use of Global Warming Potentials** (GWP) to allow comparability of the impacts of different gases on global warming (Article 5.3).
- ✱ **Common accounting** (scope, methodologies, GWPs etc), **common reporting, common sources** etc – the things that allow comparability.

The Kyoto Protocol – a treaty worth fighting for

Continued from previous page

EU for killing the Kyoto Protocol. Since then the EU has gradually increased its openness to a second commitment period. The current position of the EU – adopted by EU Environment Ministers on 10 October 2011 and confirmed by the Heads of State at the European Council on 23 October – states a preference for a single-track outcome, while confirming the EU's openness to accepting a second commitment period under the Kyoto Protocol. This, however, would only be done provided that the Kyoto Protocol is improved and a roadmap is agreed toward a legally binding framework that includes mitigation commitments from all major economies.

Despite this vague compromise position set forth in the Council conclusions, there is still wide disagreement between the different EU member states, including the European Commission, with regards to the conditions for adoption of the second commitment period. Some member states do not want to move before others move, while others argue that delaying a decision to continue the Kyoto Protocol regime could result in blockage at the negotiations.

The next decisions will be taken when Environment Ministers meet in Durban during COP17 and possibly also at the European Council meeting in Brussels on 9 December, which is the last day of the Durban conference.

7. How would the adoption of a second commitment period of the Kyoto Protocol impact the EU?

Agreeing to a second commitment period under the Kyoto Protocol demands very little from the EU. The targets mandated in the EU's own climate and energy legislation extend until 2020 and currently require more stringent compliance and enforcement than those set forth in the Kyoto Protocol.

The EU's current greenhouse gas reduction target is a reduction of 20 per cent from 1990 levels by 2020. The EU is assessing whether or not to upgrade its target to a reduction of 30 per cent, which it might fail to do before adopting a second commitment period of the Kyoto Protocol in Durban. A simple technical solution to allow the EU and other parties to easily increase their targets is to amend the Kyoto Protocol in a way that allows a more stringent target to be set without a new ratification requirement.

Abandoning the Kyoto Protocol would also send negative signals to investors and business, potentially dampening ambition towards meeting a 30-per-cent reduction or a higher target.

8. What is the difference between a political and a legally binding commitment to the Kyoto Protocol?

Some European Commission officials have brought up the concept of committing only politically, instead of legally, to a second commitment period under the Kyoto Protocol. A political commitment instead of a legally binding commitment would make it difficult to argue for legally binding commitments for others. Furthermore, a non-binding political commitment is largely inadequate to address a problem with such magnitude as climate change. CAN Europe strongly believes that such an approach would not deliver anything additional to the EU and as a concept would be most counterproductive in Durban.

9. How may we address the Kyoto Protocol's flaws, such as accounting loopholes?

The environmental integrity of emission reduction targets under any legal instrument – not only the Kyoto Protocol – must be reinforced. The current Kyoto Protocol's loopholes, namely surplus emission credits, known as 'hot air', creative land-use and forestry accounting rules and offsetting, are political rather than technical problems and equally solvable under any instrument.

Analysis by Ecofys and Climate Analytics found that current loopholes and underlying assumptions will significantly weaken the ambition level of developed countries' emission reduction targets to just 2 per cent below 1990 levels. The Cancun Agreements set a long-term goal to keep warming below 2°C, but recognised that current ambition levels are inadequate, that deep cuts are required and that mitigation efforts must be 'scaled-up', with developed countries showing leadership.

The environmental integrity of the Kyoto Protocol rules that govern the land-use and forestry accounting, carbon offsetting and surplus assigned amount units (AAU) will eventually remain the responsibility of those countries participating in the Protocol's next phase. In other words, a narrower participation in the Protocol's second commitment period also offers the EU an opportunity to amend the accounting rules beyond what was possible when negotiating the current rules.

Ulriikka Aarnio

Climate Action Network Europe



Show support for the Kyoto Protocol

The TckTckTck campaign is running a call in support of the Kyoto Protocol and to encourage EU leaders to "choose the right magic formula to save the climate and boost the economy". You can join them in "I love KP" on Facebook.

<http://www.facebook.com/ilovekyotoprotocol>

IEA calls for radical change

An insecure, inefficient and high-carbon energy system, is what we can expect if there is no radical change in the direction of policy, warned the International Energy Agency (IEA) when it launched the annual World Energy Outlook in November.

Global carbon emissions jumped by 5.3 per cent in 2010 to a record 30.4 gigatonnes (Gt), despite the deepest economic recession for decades. In a scenario where current political ambitions are implemented, global primary energy demand will increase by one-third between 2010 and 2035 according to the agency. Energy-related carbon emissions will increase by 20 per cent, and lead to levels of carbon dioxide that correspond to a 3.5°C increase in global average temperature.

Most of this increase will take place in emerging economies like China, India, Indonesia, Brazil and the Middle East. China alone will be responsible for 30 per cent of the global increase and will consolidate its position as the world's largest energy consumer. In 2035 the energy demand in China will exceed US energy demand by 70 per cent. However the per capita demand will still be half of that of the US.

The share of fossil fuels in the global energy mix will decrease from 81 per cent to 75 per cent in 2035. Renewables will increase from 13 per cent of the mix today to 18 per cent in 2035. The demand for coal and gas is expected to grow more than the demand of oil.

The continued dominance of fossil fuels is partly explained by continued high subsidies for fossil fuels, which in 2010

amounted to US\$409 billion. This can be compared to subsidies for renewables, which totalled US\$64 billion in 2010 and are expected to rise to US\$250 billion in 2035 with current political development.

Subsidies for fossil fuels are often argued to benefit the poor, but according to IEA findings only eight per cent of the 2010 subsidies reached the poorest 20 per cent of the population. Phasing out fossil fuel subsidies by 2020 would on the other hand lead to a cut of nearly five per cent in global energy demand and reduce carbon emissions by 5.8 per cent.



The IEA Executive Director: "The world risks to lock itself into an unsustainable energy future"

The IEA stresses the fact that most energy-related infrastructure has a long life span. The IEA Executive Director Maria van der Hoeven said:

"Without an urgent and radical change of policy direction the world risks to lock itself into an unsustainable energy future. Much of the energy use equipment and infrastructure, such as power stations, buildings and factories will be around for decades to come. Retiring it early will be horribly expensive."

According to the IEA calculations, 80 per cent of the cumulative CO₂ that can be emitted between 2010 and 2035 if the world is going to have a chance of achieving the 2°C scenario is already "locked-in" existing capital stock. This limits the time for action and leaves no space for misplaced investments in fossil fuels.

For a 2°C scenario, all investments after 2017 will need to be in zero-carbon utilities, unless existing infrastructure is scrapped before the end of its economic life-span. For every dollar not spent on a sustainable energy future before 2020, an additional four dollars will have to be spent after 2020 to compensate for the higher emissions.

Kajsa Lindqvist

The World Energy Outlook 2011 can be found at <http://www.iea.org/weo/>

Efficiency and renewables – not nuclear

On 9 November, the International Energy Agency (IEA) released its latest World Energy Outlook report, warning world leaders that climate change will be irreversible if they don't take strong action to reduce greenhouse gas emissions in the next five years.

Greenpeace International's energy campaigner Sven Teske commented: "The IEA's report reflects what Greenpeace has been saying for years; the increase in

average global temperature must be kept to 2 degrees Celsius. It also moves closer to Greenpeace's analysis that the world urgently needs an Energy [R]evolution, with much more of our energy demands filled by renewable energy, along with energy conservation."

"However, the IEA is once again putting politics ahead of science by suggesting that a reduction in nuclear power will lead to higher energy costs and emissions – the

opposite is the case. A combination of energy efficiency and renewables would be the way forward and could lead to a complete phase-out of nuclear power by 2035, while lowering electricity costs and carbon emissions".

Greenpeace's analysis of the World Energy Outlook can be downloaded from: <http://www.greenpeace.org/international/en/publications/reports/Energy-Revolution-vs-IEA-World-Energy-Outlook-scenario-2011/>

CCS could also impact air pollution

Carbon capture and storage (CCS) involves capturing carbon dioxide released by power stations and other industrial sources, and burying it deep underground. A new report from the European Environment Agency (EEA) shows that in addition to keeping an important greenhouse gas (GHG) out of the atmosphere, this technology will lead to benefits and trade-offs for air pollution.

According to the EEA study, CCS technologies require approximately 15–25 per cent more energy depending on the type of technology used, so plants with CCS need more fuel than conventional plants. This in turn can lead to increased direct emissions occurring from facilities where CCS is installed, and increased indirect emissions caused by the extraction and transport of the additional fuel.

While emissions of sulphur dioxide (SO₂) from power plants are predicted to fall when CCS is used, those of particulate matter (PM) and nitrogen oxides (NO_x) emissions are expected to increase in line with the amount of additional fuel consumed if no additional measures to reduce emissions are installed. Ammonia (NH₃) is the only pollutant for which a significant increase in emissions is expected to occur, with emissions potentially increasing by a factor of three or more.

A case study is also presented that quantifies and highlights the range of GHG and air pollutant life-cycle emissions that could occur by 2050 should CCS be widely implemented in power plants across the European Union.

Source: EEA press release, 17 November 2011

Web link: <http://www.eea.europa.eu/publications/carbon-capture-and-storage>



CCS requires more fuel, which means increased emissions from mining.

Tipping point for disintegration?

In recent years the West Antarctic Ice Sheet has started to show signs of instability: ice shelves the size of European countries have broken off from coastal areas and glaciers have begun to accelerate into the ocean.

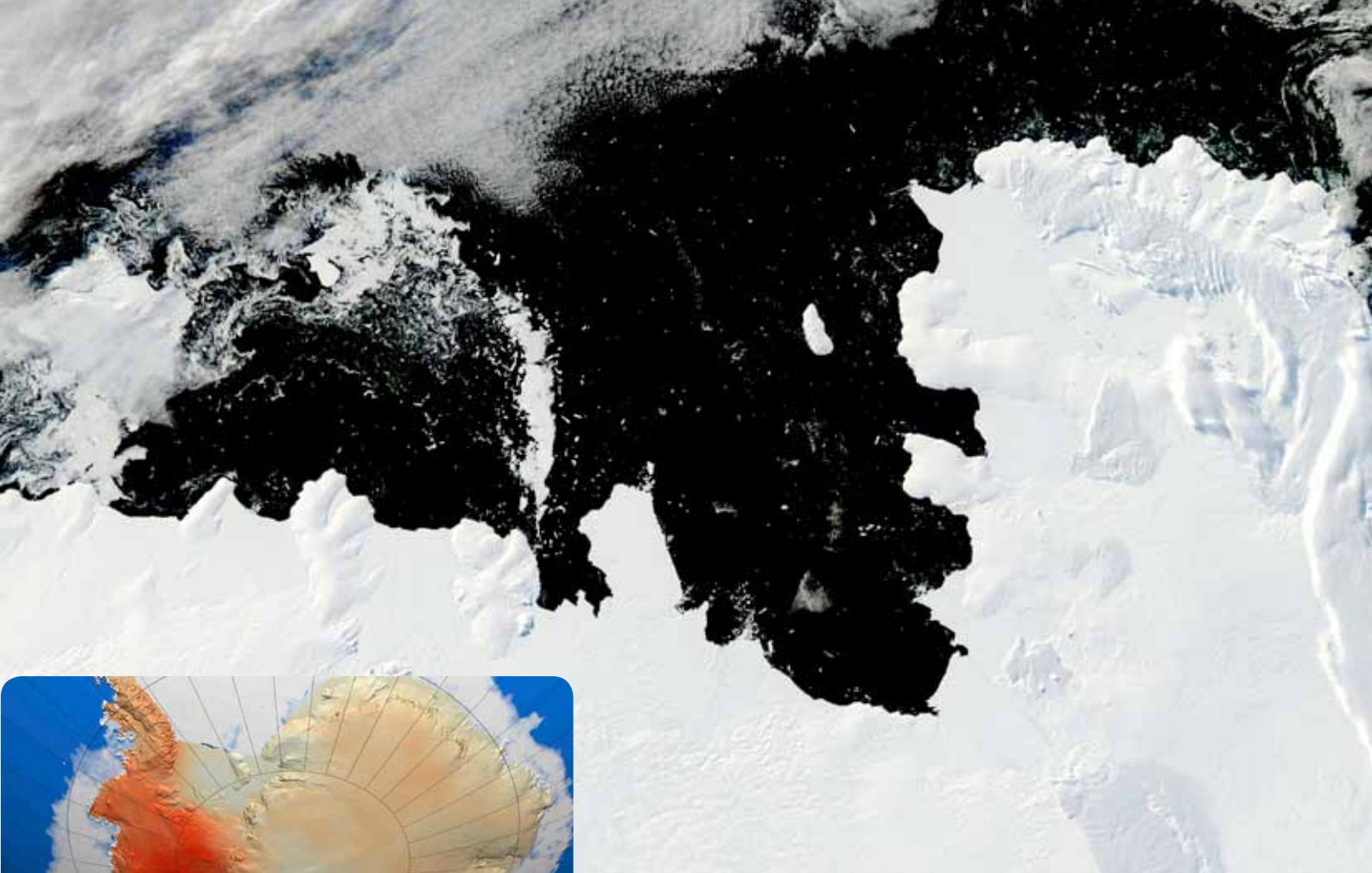
The Antarctic ice sheet covers an area of over 12 million square kilometres (three times the size of the European Union) and is up to 5000 metres thick in places. If it melts entirely, it would raise global sea levels by over 50 metres. While the collapse of the entire Antarctic ice sheet is not considered to be a likely event in the near future, a part of it, the West Antarctic Ice Sheet (WAIS) is attracting interest from the research community as it rests on a bed far below sea level, is directly interacting with the warming ocean, could raise the sea level by 5–6 metres, and is one of the most uncertain elements in modelling climate change in the near future. Over the past few decades, WAIS disintegration was considered a low-probability, high-risk event: something unlikely to happen in the next few centuries, but if it did, could bring devastating environmental and social consequences to much of the world's coastal areas. In recent years, WAIS has started to show signs of instability: ice shelves the size of European countries have broken off from coastal areas and glaciers that were once tucked safely behind the ice shelves have begun to accelerate into the ocean, rapidly thinning parts of WAIS. These events have cast doubts on earlier understanding of WAIS and there is a sense of urgency to update our models and understanding to match reality. The potential for WAIS disintegration in the near term is now considered to be greater than previously estimated. This new view of the ice sheet begs the question: at what temperature would the disintegration of WAIS be inevitable? In other words, what is WAIS' tipping point?

There is a range of estimates for the potential tipping point. Alley and MacAyeal suggested that the WAIS could already

be destined for collapse independent of anthropogenic global warming. Newer studies estimate that an irreversible collapse of the WAIS could be triggered if average global temperature rises by 1–5°C above current levels. The existence of such a tipping point would not resolve the question of how fast sea level rise would occur, though a “rapid” disintegration is conventionally considered to occur over one or two centuries. An expert elicitation project in 2002 gave a five per cent likelihood of a rapid disintegration of WAIS within the next 200 years. Katz and Worster updated these estimates and gave a higher likelihood of a rapid disintegration based on recent direct and satellite observations of the WAIS, which show parts of the ice sheet warming, thinning and accelerating. To complicate matters even further, the Antarctic ice sheet is not changing uniformly: for example, some ice streams are accelerating while others nearby are not moving at all.

A future WAIS disintegration remains a highly uncertain phenomenon that researchers are vigorously studying. Even the concept of a WAIS tipping point is still being debated, though most researchers think it would occur if temperatures continue to rise and some suggest it has already been reached, others argue that a “point-of-no-return” model is unrealistic. The research to date, along with predictive ice models, provides results that remain uncertain, but there is no doubt that the WAIS is changing, along with other parts of the world as a response to anthropogenic warming. Precautionary, global action is necessary.

Antarctic and Southern Ocean Coalition (ASOC) is a global network of environ-



NASA GODDARD SPACE FLIGHT CENTER/ CREATIVE COMMONS

TOP: Pine Island Bay is tucked into a corner of the West Antarctic's Walgreen Coast. The bay, which opens to the Amundsen Sea, is typically filled with sea ice at this time of year, but when the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua satellite passed overhead on 14 March 2010, the bay was largely ice-free.
LEFT: West Antarctic in red.

IDIOTBLOGID / CREATIVE COMMONS

mental organisations founded in 1978. It holds the only environmental non-governmental seats in the Antarctic Treaty System institutions. It aims to achieve the highest level of environmental protection of the Antarctic region and undertakes activities to proactively address current and emerging threats to the Antarctic environment at national, regional and international levels.

ASOC was instrumental in elevating climate change to a mainstream and crucial item of discussion at the annual meetings of the Antarctic Treaty Consultative Parties, Commission for the Conservation of Antarctic Marine Living Resources, and the Committee for Environmental Protection. In 2005 it began to present high-quality reviews on the state-of-the-art science on Antarctic climate change to draw Treaty Parties' attention to the urgency of climate change. These advocacy efforts have borne fruit and since 2010, climate change has been considered as a subject of high importance at annual

meetings of the Antarctic Treaty System institutions.

ASOC has now moved on to advocate for climate change action in Antarctica in line with the rest of the world: mitigation (reduction of greenhouse gas emissions from Antarctic research stations and tourists travelling to and within the Antarctic) and adaptation (protection of the Ross Sea as a climate refugium; and consideration of climate change impacts in the management of Antarctic krill). ASOC's efforts extend beyond the fora of the Antarctic Treaty System, including linking Antarctic climate issues to broader global climate processes like the UNFCCC and the IPCC. Its scientific reviews have been submitted to UNFCCC meetings and have been included in publications by the International Union for Conservation of Nature, and the Wildlife Conservation Society. The Ross Sea is one of the world's most important large marine ecosystems remaining in a relatively intact state. It supports internationally important popu-

lations of Antarctic wildlife, possesses a unique evolutionary history, and can serve as an important climate change reference area. ASOC proposes a series of steps to fully protect the Ross Sea. At the 2008, 2009 and 2010 ATCM and CCAMLR meetings ASOC introduced detailed information papers on the Ross Sea. The US government introduced papers making the science case for protection prepared by Grant Ballard and David Ainley, ASOC collaborators, at the 2010 meeting of CCAMLR's Working Group on Ecosystem Monitoring and Management.

Tina Tin and Jessica O'Reilly
Antarctic and Southern Ocean Coalition

The Future of the West Antarctic Ice Sheet: Observed and Predicted Changes, Tipping Points, and Policy Considerations can be downloaded at http://asoc.org/storage/documents/ATME/future_of_WAIS.pdf

Read more about climate change and the Antarctic at: <http://asoc.org/issues-and-advocacy/climate-change-and-the-antarctic>



GREGORIUS MUNDUS / CREATIVE COMMONS

Modal shifts are essential for the EU to meet the GHG targets.

Transport key to meeting environmental targets

GHG emissions from transport in the EU have increased by 27 per cent since 1990. Modest efficiency gains have been outpaced by growing demand.

A new report on transport and the environment shows that emissions of many pollutants from transport fell in 2009, but this reduction was most likely only a temporary effect of the economic downturn. This means that a more fundamental shift in Europe's transport system is now needed, so that emissions do not increase even in times of strong economic growth.

The latest annual report on transport emissions from the European Environment Agency (EEA) covers issues such as energy consumption, emissions, transport demand, price trends and fleet monitoring. It also considers a set of quantitative

targets proposed by the European Commission's 2011 roadmap on transport (see AN 2/11, p. 6).

The report shows that there are significant opportunities for policy makers to coherently address environmental issues connected with transport, for example by addressing air quality and climate change together.

Some efficiency gains have been made in the transport sector. But these relatively modest gains are often outpaced by growing demand, even if the recent economic recession temporarily slowed activity in some areas. Between 1990 and 2009, demand

for transport grew by approximately one third, leading to a 27 per cent increase in greenhouse gases (GHG) from transport in the same period.

Overall, transport was responsible for 24 per cent of EU GHG emissions in 2009. The roadmap states that EU member countries must reduce GHGs from transport by 60 per cent by 2050, compared to 1990 levels. Since emissions actually increased between 1990 and 2009, the EU must make an overall 68 per cent reduction between 2009 and 2050.

While annual energy consumption in transport grew continuously between

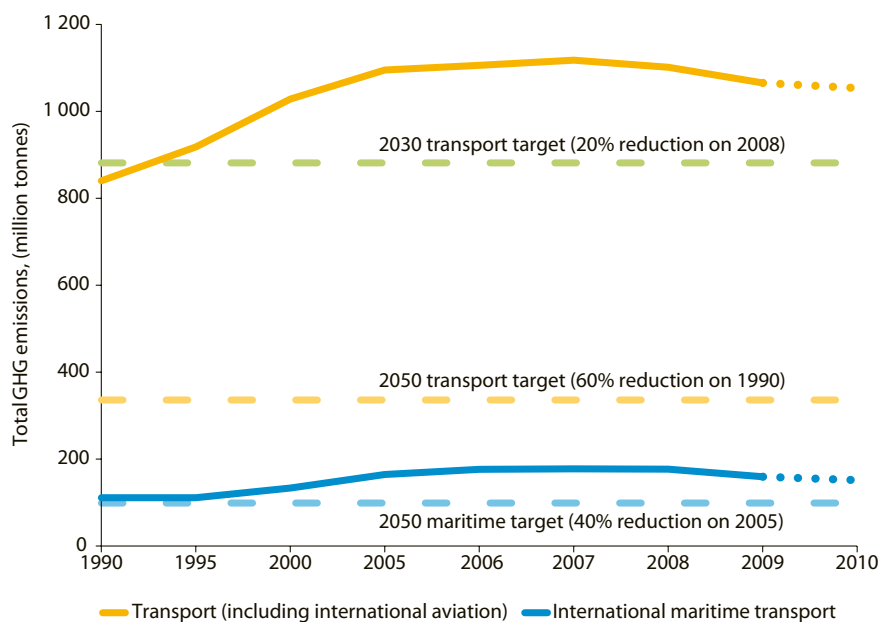


Figure. EU27 transport emissions of GHG 1990-2050 (current baseline year: 2009)

1990 and 2007, there was a drop of four per cent over the period 2007-2009. The upward trend is likely to resume with economic growth, however.

In spite of progress since 1990 in reducing the emissions of many air pollutants from transport, EU air quality objectives are still exceeded in many areas. For nitrogen dioxide (NO₂), the annual limit value was exceeded at 41 per cent of traffic monitoring stations in 2009 and the daily limit value for particulate matter (PM₁₀) was exceeded at 30 per cent of the traffic sites across the EU. Road transport in particular makes a large contribution to urban air pollution.

Noise from transport sources is a significant environmental problem. Almost 100 million people were exposed to damaging long-term average levels of noise from road vehicles on major roads. Evidence published by the World Health Organization (WHO) indicates that at least one million healthy life years are lost every year in Europe as a result of noise from road traffic alone.

Roads, motorways and railways are cutting up Europe's landscape into ever smaller parcels, with serious consequences for biodiversity. It is estimated that nearly 30 per cent of land in the EU is moderately, highly or very highly fragmented, restricting the movement and breeding of many different species.

Over the last few decades, the application of technology has been the primary method for reducing the environmental impacts of transport, and technology has also been identified as the most important means to achieve the Commission's target of a 60 per cent GHG reduction from transport by 2050.

But technical solutions alone cannot achieve this target. Demand optimisation, including modal shifts, will form an essential part of meeting this target, and can be very cost-effective as well as offering environmental co-benefits, such as air quality improvements and noise reduction.

The report includes a chapter on carbon dioxide (CO₂) emissions from cars, and before the end of this year EEA will release updated data on manufacturers' progress towards CO₂ targets for new cars.

Christer Ågren

Laying the foundations for greener transport.

TERM 2011: Transport indicators tracking progress towards environmental targets in Europe.

EEA Report No 7/2011. Published 10 November 2011. Available at: <http://www.eea.europa.eu/publications/foundations-for-greener-transport>

Recreational boats to become less polluting

The European Commission proposes stricter limits for nitrogen oxides (NO_x), hydrocarbons (HC) and particulate matter (PM) for new motor boats, sailing boats, jet skis and other recreational craft. In summer NO_x emissions from the six million or so recreational craft in the EU can be significant around big lakes and popular seashores. It is proposed that propulsion engines will be designed and constructed to emit 20 per cent less HC+NO_x emissions and 34 per cent less particulate matter.

Source: European Commission press release, 26 July 2011

Extended emission limit derogations for tractors

New rules on derogations to the stricter stage IIIB air pollutant emission limits for tractors have been adopted by the EU Ministers. The stage IIIB limits entered into force in January 2011, and under the new rules up to 40 per cent of each manufacturer's sales, averaged over the past five years, will be allowed to meet less stringent limits. As an alternative option it was also agreed to allow derogation for up to 250 models sold by each manufacturer, depending on engine size.

Source: ENDS Europe Daily, 20 July 2011



Two out of five tractors sold do not need to comply with the new air pollution standards.

THAD ROAN / CREATIVE COMMONS

Serious air quality problems in Europe

Between 80 and 90 per cent of the EU urban population is exposed to levels of harmful particulate matter (PM₁₀) exceeding the air quality guideline set by the World Health Organization, and more than 95 per cent is exposed to ozone exceeding this level.

Air quality in Europe has improved over the last twenty years, as emissions of most air pollutants have fallen, according to a new report from the European Environment Agency (EEA). But even though emissions have fallen, this has not always led to a corresponding drop in pollutant concentrations in the air.

This is particularly the case for particulate matter (PM) and ground-level ozone, which have complex relationships between emissions and air quality, and concentration levels of these two pollutants have remained relatively stable over recent years despite efforts to improve air quality.

Ozone and PM are also the most problematic pollutants for health. Epidemiological studies show that the most severe health damage from exposure to air pollution is associated with particulate matter and, to a lesser extent, ozone. Both pollutants can cause or aggravate cardiovascular and lung diseases and lead to premature death.

Eutrophication, an oversupply of nutrient nitrogen in terrestrial and aquatic ecosystems, is another major problem caused by air pollutants. Ammonia (NH₃) from agriculture and nitrogen oxides (NO_x) from combustion processes are a main cause of eutrophication. They are now also the main acidifying air pollutants, as emissions of sulphur dioxide (SO₂) have fallen significantly over the last two decades. Projections for 2010 have shown that 69 per cent of the

total sensitive ecosystem area in the EU was at risk of eutrophication and 11 per cent was at risk of acidification.

Twenty per cent of the EU urban population lives in areas where the EU air quality 24-hour limit value for PM₁₀ concentration was exceeded in 2009. For the 32 member countries of the EEA, the estimate is 39 per cent. However, 80-90 per cent of the EU urban population was exposed to levels of PM₁₀ which exceed the more stringent World Health Organization (WHO) air quality guideline of 20µg/m³ as an annual mean. This situation does not seem to be improving.

Particulate matter in the atmosphere originates both from direct emissions

(primary particles) and as a product of oxidation (secondary particles) of so-called PM precursor gases, namely SO₂, NO_x, NH₃ and volatile organic compounds (VOCs). PM precursor emissions decreased between 1999 and 2009 in the EU: SO₂ by 56 per cent, NO_x by 28 per cent, and NH₃ by 11 per cent. Emissions of primary PM₁₀ and PM_{2.5} decreased by 16 and 21 per cent respectively in the same period.

Although man-made emissions of many of the precursors to ozone formation have declined, ozone levels did not fall significantly between 1999 and 2009. Approximately 17 per cent of European citizens live in areas where the EU health-related target level for ozone concentration was exceeded in 2009. If ambient ozone levels are compared to the more stringent WHO guidelines, more than 95 per cent of the EU urban population was exposed to ozone exceeding this level.

Moreover, about one third of the total arable land in the 32 EEA member countries was exposed to levels of ozone above the EU vegetation-related target level.

Ozone is not directly emitted into the atmosphere but formed from a chain of photochemical reactions following emissions of the precursor pollutants NO_x, VOCs, carbon monoxide (CO) and methane (CH₄).

Very few EU urban citizens are exposed to levels of SO₂ above the EU limit value, al-



though 68–85 per cent of the EU urban population is potentially exposed to levels above the WHO guidelines.

Concentrations of NO₂ have declined slightly in recent years, and exceedances of EU air quality limits usually occur at hotspots, such as main roads. Twelve per cent of the European urban population live in areas with urban background (non-traffic) concentrations of NO₂ exceeding EU and WHO levels.

Atmospheric levels of arsenic, cadmium, lead and nickel are generally low in Europe. However, heavy metal levels can build up in soils, sediments and organisms. Despite considerable cuts in emissions of heavy metals since 1990 in the EU, a significant share of the ecosystem area is still at risk of heavy metal contamination. Exceedances of mercury critical loads were projected to occur in 54 per cent of sensitive ecosystems areas in 2010 under current legislation, while for lead the projected exceedance area is 12 per cent of sensitive ecosystem areas.

The links between air quality and other policy areas are mentioned in the report, and it is noted that measures aimed at combating climate change or noise may contribute substantially to reducing air pollution, while some climate measures may worsen air quality. Likewise, air quality measures can have both positive and negative climate change impacts.

“Europe’s air quality is generally getting better, but concentrations of some pollutants are still endangering people’s health,” Jacqueline McGlade, EEA Executive Director, said. “To improve air quality further, we need to use many different kinds of policies and measures. These could include reducing emissions levels at source, better urban planning to reduce people’s exposure and lifestyle changes at the individual level.”

Christer Ågren

Air quality in Europe – 2011 report. EEA Technical report No 12/2011. Published 9 November 2011. Available at: <http://www.eea.europa.eu/publications/air-quality-in-europe-2011>

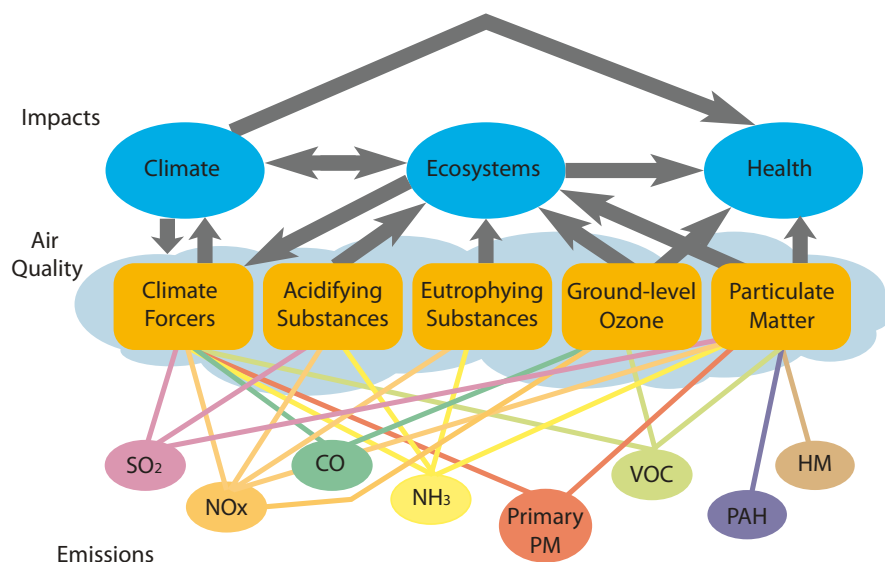


Figure 1. Major air pollutants in Europe, clustered according to impacts on human health, ecosystems and the climate.

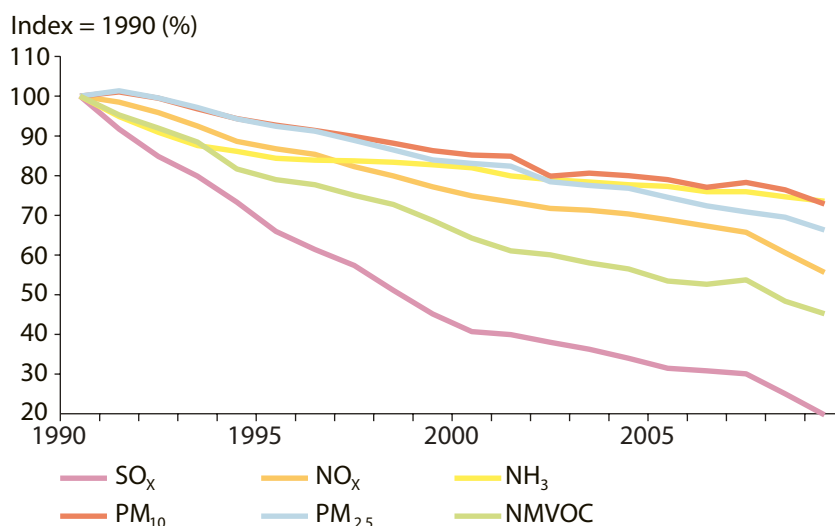


Figure 2. EU emissions of primary PM and of PM and ozone precursor gases 1990–2009

Table. Percentage of the urban population in the EU exposed to air pollutant concentrations above the EU and WHO reference levels

Pollutant	EU reference value	Exposure estimate (%)	WHO AQG	Exposure estimate (%)
SO ₂	Day (125)	0.3–2.3	Day (20)	68–85
NO ₂	Year (40)	7–19	Year (40)	7–19
PM ₁₀	Day (50)	18–40	Year (20)	80–90
Pb	Year (0.5)	< 1	Year (0.5)	< 1
CO	8-hour (10)	0–2	8-hour (10)	0–2
O ₃	8-hour (120)	16–50	8-hour (100)	> 95

Colour coding of exposure estimates, fraction of urban population exposed to concentrations above the reference level:

< 10 %	10–50 %	50–90 %	> 90 %
--------	---------	---------	--------

Note: The reference levels included comprise EU limit or target levels and WHO air quality guidelines (AQG). The averaging period is shown and the reference levels in brackets are in µg/m³ except for CO which is in mg/m³.

For some pollutants EU legislation allows a limited number of exceedances. This aspect is considered in the compilation of exposure in relation to EU air quality limit and target values.

The comparison is made for the most stringent EU limit or target values set for the protection of human health. For PM₁₀ the most stringent standard is for 24-hour mean concentration.

This estimate refers to a recent three-year period (2006–2008) and includes variations due to meteorology, as dispersion and atmospheric conditions differ from year to year.

US clean air rules could create 1.5 million jobs

Regulations to reduce air pollution could create more than one million jobs, according to a study by a coalition of investors and environmental groups and an association for pollution control companies. The two EPA rules under consideration are the Cross-State Air Pollution Rule (CSAPR) and the Mercury and Air Toxics Standards Rule.

The Political Economic Research Institute at the University of Massachusetts at Amherst prepared the analysis, which estimated that investments driven by these two air quality rules would result in nearly 1.5 million jobs, or about 300,000 jobs per year on average, over the next five years.

Source: Platts, 17 November 2011

Web link to the report: <http://www.ceres.org/resources/reports/new-jobs-cleaner-air-part-two/view>



Hey guys, let's do something about this air pollution problem.

Non-road emission standards delayed

New and stricter air pollution emission standards for non-road mobile machinery (NRMM), such as tractors and locomotives, are unlikely to enter force before 2016, the European Commission said on 1 August in a written response to a parliament question. The forthcoming revision of the 1997 directive, which was due in 2007, will bring small stationary engines under NRMM legislation and set new emission limits for diesel engines. A proposal is expected to be presented in 2012.

Source: ENDS Europe Daily, 3 August 2011

EU trends for greenhouse gas emissions

Macro-economic factors have been the biggest influence on changes in greenhouse gas emissions in the EU over the past two decades. To achieve the needed reduction of 80-95 per cent by 2050 impact from policy must increase.

The European Environment Agency (EEA) has studied the underpinning drivers and the influence of policy on greenhouse gas (GHG) emissions in the EU between 1990 and 2008. Over this period emissions dropped by 11.1 per cent, most of the change occurring in the 1990s. There was an increase between 1999 and 2003, followed by a slow decrease until 2008. The dramatic drop in emissions in 2009 due to the financial crisis and the strong rebound in 2010, are covered in two separate studies from EEA.

The single most important factor to explain emission trends is related to the economy. It is a well-known fact that the collapse of the Soviet Union and the restructuring of eastern European

economies that followed had great impact on the region's GHG emissions. Heavily polluting industries were shut down, and the restructuring of the agricultural sector caused a drop in the number of cattle and in related methane emissions. In southern Europe the economy expanded over the period 1990 to 2008. Higher living standards resulted in higher energy demand and an increase in emissions.

Although the economy has had the greatest impact on emissions it does not mean that policy has had none. One interesting finding is that several policies with other aims than reducing GHG emissions have so far contributed the most to climate mitigation. The Large Combustion Plant (LCP) Directive, later reinforced through

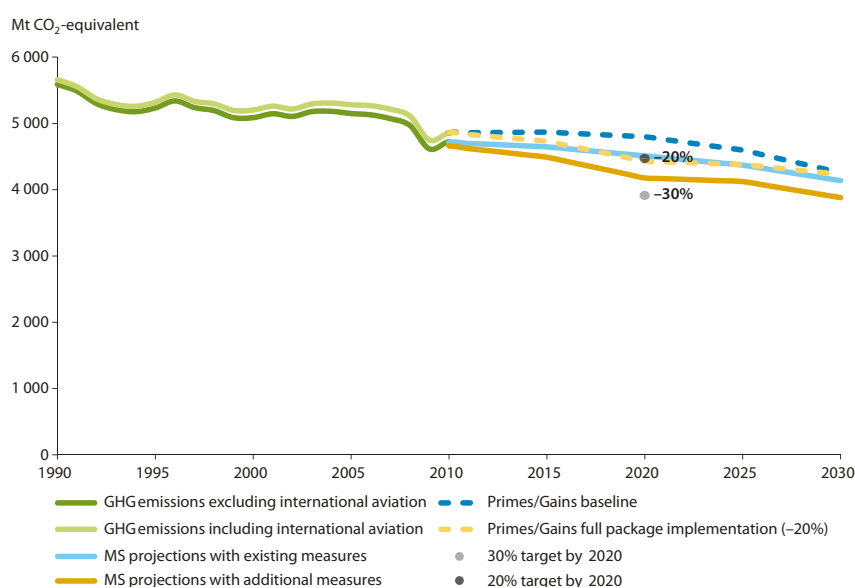


Figure. Trends and projections of EU total GHG emissions. Note that member state projections do not include emissions from international aviation. Such emissions are included in the Primes-Gains scenarios. 2025 and 2030 projections based on information provided by 12 member states. For other member states, 2030 projections were interpolated using the 2020–2025 and 2020–2030 relative trends available from the Commission's scenarios based on the Primes and Gains models.



Can you reduce greenhouse gas emissions unintentionally? The Nitrates Directive was mainly adopted to protect waters from nitrate pollution, but the changed fertilizing practises that came out of it also caused a drop in nitrous oxide emitted into the atmosphere.

the Integrated Pollution Prevention and Control Directive (IPPC), was conceived with the primary intention to improve air quality, but caused a switch in fuels that also led to a reduction in carbon emissions.

Another piece of policy that has impacted on GHG emissions is the Nitrates Directive, which was enforced with the main intention to protect waters from nitrogen pollution. The reduction in fertilizers applied to agricultural soils also led to a reduction in the amount of nitrous oxide emitted into the atmosphere.

Policies with clear climate ambitions have had relatively little impact up to 2008. One reason is that several of them were only introduced late in the studied period. Mandatory energy taxation for all EU member states is one example. This has not resulted in a change in consumer behaviour since the minimum level is set too low to have any significant impact. But for forerunner countries like Germany, Sweden and Denmark with relatively high energy and CO₂ taxes, energy taxation was shown to have an impact.

The EU emissions trading scheme (ETS) was implemented in 2005. For the first trading period (2005-2008) reductions due to reform were modest, because of the generous emission caps given to eastern European countries, among others. The

ETS system will also contribute to smooth out the effects of temporary economic recession. The emission reductions due to the recent financial crisis took place mainly within the ETS sector, so these emission reductions can be banked and traded in years of economic growth.

Transport is the sector that has seen the greatest increase in GHG emissions during the past twenty years. Between 1990 and 2008, emissions grew by 24 per cent (34 per cent if aviation is included). Ninety-four per cent of total emissions from this sector come from road transport. The pace of the increase fell for passenger cars during the period, but for freight transport, emissions kept growing faster than GDP. Savings due to improvements in engine efficiency were eaten up by an increase in volume. Policies intended to shift to less carbon-intensive means of transport such as rail and shipping have not been sufficient to decrease the share of road transport.

According to the EEA's projections of future GHG emissions, the EU-27 will not reach its 20 per cent target by 2020 with existing measures, but if all planned measures are implemented they will come as close as 19 per cent (figure). If the EU target is increased to 30 per cent, further

efforts are needed. To achieve the deep long-term reduction that is required, 80-95 per cent by 2050, EU member states need to enhance their efforts even more.

Though much of the past emission reductions have been driven by changes in the economy, recent trends show that there is a great opportunity for policy to be of more significance in the future. Professor Jacqueline McGlade, Executive Director of EEA said:

"Many different policies have played an active role in bringing down greenhouse gas emissions. Alongside renewable energy or energy efficiency, efforts to reduce water pollution from agriculture also led to emission reductions. This experience shows we can reduce emissions further if we consider the climate impacts of various policies more systematically."

Kajsa Lindqvist

The EEA reports **Greenhouse gas emissions in Europe: a retrospective trend analysis for the period 1990-2008, Tracking progress towards Kyoto protocol and 2020 targets in Europe and Approximated EU GHG inventory: Early estimates for 2010** can be downloaded at: <http://www.eea.europa.eu/pressroom/newsreleases/eu-greenhouse-gas-emissions-estimated>

Coal is dirty and costly

Economic analysis of the costs of air pollution damage to the United States shows that coal-fired power generation is under-regulated and incredibly costly.

In a recent article published in *American Economic Review*, three economists calculate the cost imposed on society by air pollution from 10,000 pollution sources from different types of industry. Their analysis includes five major traditional air pollutants (sulphur dioxide, nitrogen oxides, volatile organic compounds, ammonia and particulate matter). In a separate analysis specifically for the electric power generation sector, estimates of the costs of damage due to carbon dioxide emissions are also included.

The “gross external damages” (GED) are estimated by calculating the measurable costs of pollution impacts on human health, decreased agriculture and timber yields, reduced visibility, accelerated depreciation of materials, and reductions in recreation services. Most of the damage due to air pollution resulted from human health effects, especially premature deaths from exposure to elevated levels of PM_{2.5}. (The value placed on mortality risks is subject to some debate and this study employed a value of US\$6 million per premature mortality.)

Overall, they estimate that aggregate air pollution damages (i.e. not including CO₂ damages) from all industries in 2002 – the last year for which the necessary data was available – amounted to US\$184 billion. Coal-fired power generation caused the largest GED of all industries, at US\$53.4 billion/year, followed by crop production (15.3 bn), livestock production (14.8

bn), highway, street and bridge construction (13.0 bn), truck transportation (9.2 bn), and water transportation (7.7 bn).

It should be noted that pollution from households, including private cars, was not included in the US\$184 billion, since it is said to reflect non-commercial activities.

In order to determine whether correcting for external costs would have a substantial effect on the net economic impact of different industries, the paper also compares the GED to the value added (VA) by a given industry. According to the authors, a GED/VA ratio greater than one

“indicates that the air pollution damage from these industries is greater than their net contribution to output.” Among the industries with a high GED/VA ratio are solid waste combustion and incineration, petroleum-fired power generation, sewage treatment facilities, and coal-fired power generation.

The authors suggest that one interpretation of these results is that air pollution from the industries with high GED/VA ratios is not efficiently regulated. Another possibility is that the value added as

measured in the current national accounts may not fully reflect the value added by a given industry.

Using the example of SO₂ from coal-fired power generation, which is regulated by a cap-and-trade programme, the authors say that “to equate the marginal cost of abatement with marginal damages, the quantity of allowances should be sharply reduced.”

When the GED associated with coal-fired electricity generation was examined more closely, it was shown that emissions of SO₂ are responsible for the bulk of damages (87%), followed by emissions of PM_{2.5} (7%) and NO_x (6%). Mortality and morbidity dominate the damage, accounting for more than 98 per cent of the monetised damage.

The study also looked at GED in relation to electricity prices. In 2002, the average market price for electricity supplied to residential consumers in



Concerned customers want banks to invest in something more sustainable.

the US was 8.4 cents per kilowatt hour (kWh), while in states that primarily rely on coal-fired power, consumer prices were lower, averaging 6 cents/kWh. It was found that electricity produced by coal-fired plants had the highest GED of 2.8 cents/kWh, followed by oil-fired plants at 2 cents and natural gas plants at 0.1 cents.

If the estimated GEDs from CO₂ emissions are also included, the damages caused by coal- and oil-fired plants rise by 30-40 per cent, meaning that for coal-fired plants the GED/kWh would increase to 3.6 cents, and for oil-fired plants to 2.7 cents. These figures are based on using a central estimate for climate change damage of US\$27 per ton of carbon – lower and higher estimates of US\$6/ton C and US\$65/ton C were also used for sensitivity analyses.

The results of the study show among other things that emissions of SO₂ and CO₂ from coal-fired power plants are under-regulated, and that it would benefit both the US economy, public health and the environment to strictly regulate these pollutants.

Earlier this year, a study led by Harvard University professor Paul Epstein estimated that the life cycle effects of coal cost the US public between US\$175 and 523 billion annually. Accounting for the damages would double or even triple the price of electricity from coal per kWh generated, making wind, solar, and other forms of non-fossil fuel power generation, along with investments in efficiency and electricity conservation methods, economically competitive.

Christer Ågren

Environmental Accounting for Pollution in the United States Economy. By N. Z. Muller, R. Mendelsohn and W. Nordhaus. *American Economic Review* 101, August 2011.

<http://www.aeaweb.org/articles.php?doi=10.1257/aer.101.5.1649>

Full cost accounting for the life cycle of coal. By P. Epstein et al. *Annals of the New York Academy of Sciences* 1219, February 2011.

http://chronmyklimat.pl/theme/UploadFiles/File/_2011_pliki/03/epstein_full%20cost%20of%20coal.pdf

Calculating the cost of carbon emissions

The social cost of carbon – or marginal damage caused by an additional ton of carbon dioxide emissions – has been estimated by a US government working group at US\$21 in 2010. This is not a large number. It seems to suggest that we don't need to do much about climate change: if a proposed climate policy would cost more than US\$21 per ton of reductions in carbon dioxide emissions, then, according to this calculation, it's not worth doing.

But the government's calculation omits many of the biggest risks associated with climate change, and downplays the impact of our current emissions on future generations. A reanalysis by Frank Ackermann and Elizabeth A. Stanton at the Stockholm Environment Institute (SEI) explores the effects of uncertainty about climate sensitivity, the shape of the damage function, and the discount rate.

Their analysis shows that the social cost of carbon is uncertain across a broad range, and could be much higher than US\$21 – according to their worst-case calculations, the social cost of carbon could be almost US\$900 in 2010, rising to US\$1,500 in 2050. If the damages per

ton of carbon dioxide are that high, then almost anything that reduces emissions is worth doing.

The most ambitious scenarios for eliminating carbon dioxide emissions as rapidly as technologically feasible (reaching zero or negative net global emissions by the end of this century) require spending of up to US\$150-500 per ton of reductions in carbon dioxide emissions by 2050.

They conclude, therefore, that when using a reasonable set of alternative assumptions, the damages from a ton of carbon dioxide emissions in 2050 could exceed the cost of reducing emissions at the maximum technically feasible rate. Once this is the case, the exact value of the social cost of carbon loses importance – the clear policy

prescription is to reduce emissions as rapidly as possible, and cost-effectiveness analysis offers better insights for climate policy than cost-benefit analysis.

Climate risks and carbon prices: Revising the social cost of carbon. July 2011. By Frank Ackermann and Elizabeth A. Stanton, SEI. Published by Economics for Equity and the Environment network. Available at: <http://www.sei-us.org/publications/id/399>



Now let's see... droughts, hurricanes, flooding...

The two-degree window is closing up

If the world is going to have a likely chance (more than 66 per cent) of limiting global warming to less than two degrees, emissions of carbon dioxide need to peak between 2010 and 2020, according to newly published scenarios in the journal *Nature Climate Change*. The UN FCCC conference in Durban, South Africa starting on 28 November may thus be the last opportunity to put the necessary brakes

on global greenhouse gas emissions. If this is not achieved, large parts of Africa, most of Russia and northern China will be two degrees warmer in less than 10 years.

Source: IPS news, 23 October and 2011
Web Link to *Nature Climate Change*: <http://www.nature.com/nclimate/journal/v1/n8/full/nclimate1258.html#/>

Cheaper and more efficient

Previous claims that reducing CO₂ emissions would make new cars unaffordable are shown to be unfounded in a new report by Transport and Environment. Quite the opposite, cars have actually become cheaper while becoming more carbon-efficient.

CREATIVE TOOLS / CREATIVE COMMONS



In the run-up to adoption of the present regulation on CO₂ emissions from cars in 2009, two different studies were commissioned by the European Commission to estimate what it would cost to reduce CO₂ emissions from new cars. The first study, published in 2001, used 1995 as a base year and showed that reducing emissions by 25 per cent to an average of 140 grams of CO₂ per kilometre (g/km) would cost more than €2400 per car. The second study was published in 2006, in which 2002 figures were used as a baseline. The conclusion was that a reduction of 16 per cent, that is 140 g/km, would increase the retail price by €1200 per vehicle.

Four years after the publishing of the second report, in 2010, the target of the two reports had in fact been reached. The average car sold in the European Union now emitted 140.3 g/km. Had the reduction been as costly as the two reports had shown?

To find out, Transport and Environment

used data from the European Commission's competition department. Every year it publishes a study comparing car prices in the EU. The figures are corrected for inflation and for changes in the fleet mix, such as the shift to smaller and cheaper cars during the recent financial crisis.

During the eight-year period for which data was available, beginning in November 2002, cars became 13 per cent cheaper (figure 1), with an average annual price reduction of 1.7 per cent. For a typical €20,000 car this overall change of 13 per cent equals €2600. Even if retail prices do not directly reflect production costs it is clear that any fears that the CO₂ regulations would make prices skyrocket were unfounded.

Transport and Environment also reviews overall development in the car industry towards the 2015 target of 130 g/km (figure 2). Between 2007 and 2010, over the time period when legally binding CO₂ targets have been a reality for the

industry, average emission decreased by 4.0 per cent a year. This can be compared to the average rate between 2002 and 2007 when emissions decreased by just 1.2 per cent a year. At the present rate it looks as if car manufacturers will reach the target of 130 g/km ahead of time.

How could the two studies, conducted on behalf of the European Commission, be so wrong? And why are the targets so easy to reach? A common mistake when predicting costs to meet stricter environmental regulation that requires new technology is that the change in costs as niche technology becomes mainstream technology is completely or partly ignored. The effects of mass production and acquired knowhow will normally result in significantly lower costs.

Another dilemma is that the best information about future costs comes from the industry itself, which has few incentives to be optimistic about the costs of new

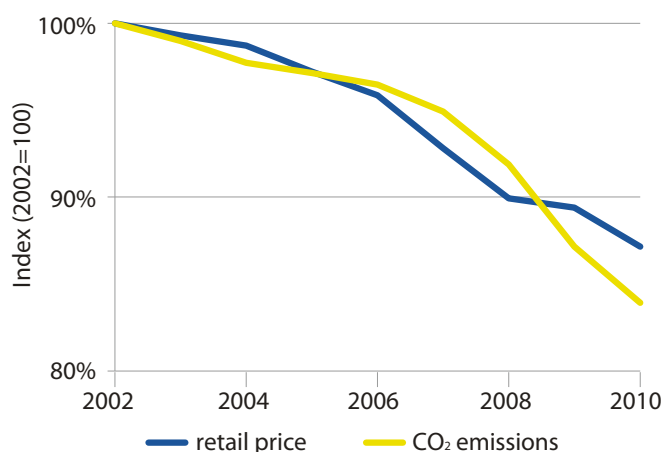


Figure 1. fleet-average CO₂ emissions of new cars in the EU versus regulatory CO₂ targets

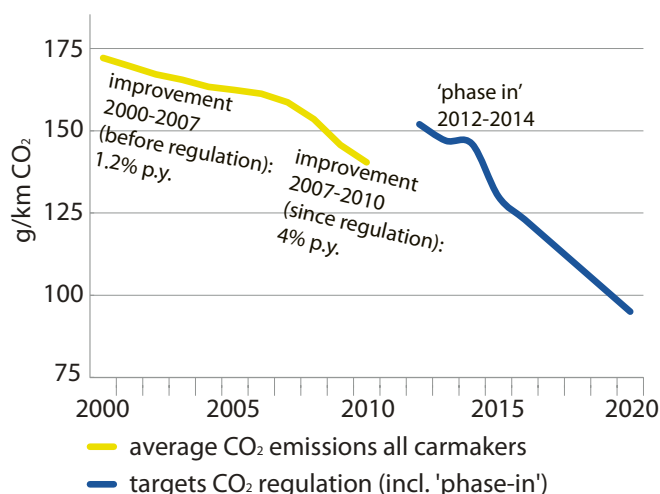


Figure 2. Trends in car prices and CO₂ 2002-2010 (2002 = 100%)

CO₂ standards for passenger cars

The CO₂ emission standard for cars is designed to ensure that the average new car sold in the European Union by 2015 should emit no more than 130 g/km, and by 2020 no more than 95 g/km. The process of developing this regulation began back in 1995 and was hampered by several steps of weakening and postponement. The core of the regulation is a linear limit curve, where the weight of the car is a variable. Heavier cars are allowed to emit more than the 130 g/km and lighter cars less. This has been criticised for inhibiting producers from developing lighter cars with the same capacity as existing heavy models. Instead a "footprint model" is proposed in which the area between the wheels should determine the emissions allowed.

environmental regulations. Companies that are lagging behind in the development of new technology will obviously want to delay any enforcement. But those leading the way also have an incentive not to reveal just how low production costs may be, as such data is seen as a commercial secret. Even suppliers of clean technology who would in theory have an interest in presenting optimistic figures may not do so, since customer relationships are too sensitive.

The result is a double negative bias. Jos Dings, director of Transport and Environment said:

"Clearly the EU needs to learn lessons from this. When it comes to future targets to improve fuel efficiency, industry cost estimates should be taken with an SUV-sized pinch of salt."

Kajsa Lindqvist

How clean are Europe's cars? Transport and Environment September 2011 can be downloaded at: http://www.transportenvironment.org/Publications/prep_hand_out/lid/653

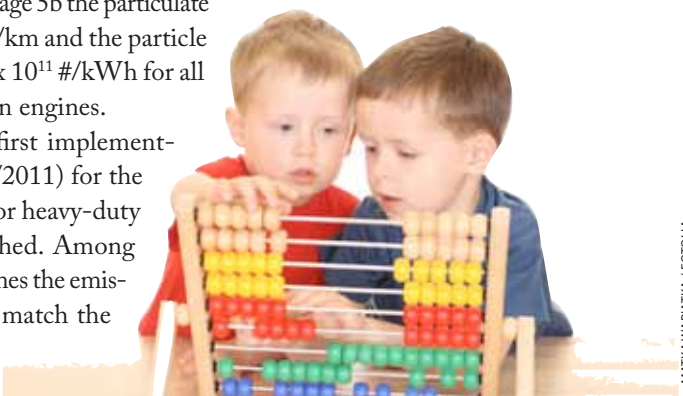
Euro standards comitology regulations published

On 16 June a regulation (566/2011) was published that introduces further amendments to the Euro 5 and Euro 6 standards for light-duty road vehicles. It includes measurement procedures for particle mass and particle number. These are required to implement the Euro 5b stage, which starts on 1 September 2011 for new types and 1 January 2013 for all new vehicles. From stage 5b the particulate mass limit is 4.5 mg/km and the particle number limit is 6.0×10^{11} #/kWh for all compression ignition engines.

On 25 June the first implementing regulation (582/2011) for the Euro VI standards for heavy-duty vehicles was published. Among other things, it redefines the emission limit values to match the world-harmonised test cycles (WHTC transient cycle and

WHSC stationary cycle), and incorporates particle number limits for compression ignition engines, at the levels of 6.0 and 8.0×10^{11} #/kWh, depending on test cycle. Particle number limits for positive ignition engines have yet to be defined.

Official Journal: <http://eur-lex.europa.eu/JOIndex.do>



MATKA VARIATKA / FOTOLIA

Particle numbers count under the new amendments to Euro 5 and Euro 6.

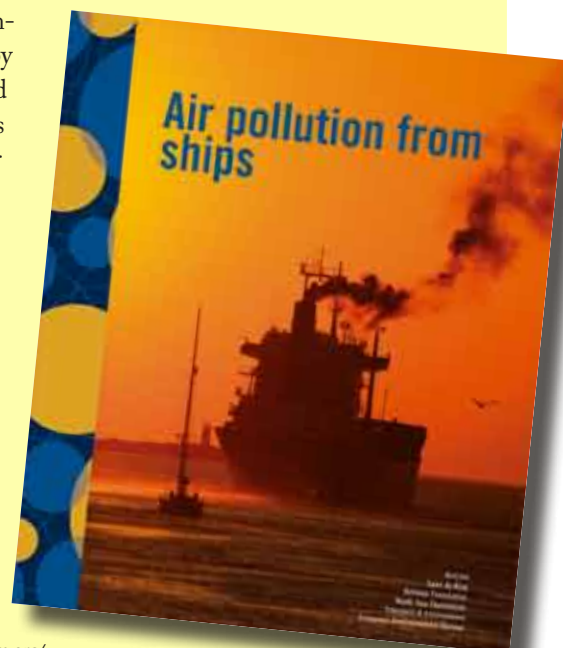
Updated brochure on ship emissions

Shipping is a major cause of harmful air pollution in Europe and by 2020 shipping emissions of SO₂ and NO_x 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.

It is free to download from <http://www.airclim.org/>



Recent publications from the Secretariat

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



For Clean Air Everywhere: what can be done to decrease air pollution?

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.

Coming events

UNFCCC 17th Session of the Conference of the Parties and 7th Session of the Meeting of the Parties to the Kyoto Protocol. South Africa, 28 November - 9 December 2011. Information: <http://unfccc.int>

Towards the 2013 revision of the ambient air quality directive – Issues and solutions. London, UK, 12-13 December, 2011. Information: www.aamg-rsc.org

CLRTAP Executive Body. Geneva, Switzerland, 12-16 December 2011. Information: www.unece.org/env/lrtap/

EU Environment Council. 19 December 2011. Information: <http://europa.eu/eucalendar/>

IMO Marine Environment Protection Committee (MEPC). London, UK, 27 February - 2 March 2012. Information: www.imo.org

EU Environment Council. 9 March 2012. Information: <http://europa.eu/eucalendar/>

Air Quality Conference. Athens, Greece, 19-23 March 2012. Information: www.airqualityconference.org

Planet Under Pressure. London, UK, 26-29 March 2012. Information: <http://www.planetunderpressure2012.net/>

9th Green Ship Technology Conference. Copenhagen, Denmark, 27-29 March 2012. Information: <http://www.informaglobalevents.com/event/greenshipstechnology>

Biomass Conference. Denver, United States, 16-19 April 2012. Information: www.biomassconference.com

CLRTAP Working Group on Strategies and Review. Geneva, Switzerland, 30 April - 4 May 2012. Information: www.unece.org/env/lrtap/

World Bioenergy: Conference and exhibition. Jönköping, Sweden 29-31 May 2012. Information: www.worldbioenergy.org

4th MinNox Conference. Berlin, Germany, 12-13 June 2012. Information: www.iav.com/termine/iav-tagung/4-tagung-minnox

2nd Urban Environmental Pollution Conference. Amsterdam, Netherlands, 17-20 June 2012. Information: www.uepconference.com

RIO+20 United Nations Conference on Sustainable Development. Rio de Janeiro, Brasil, 20-22 June 2012. Information: www.uncsd2012.org/rio20/

Worlds within reach – from science to policy. IIASA 40th Anniversary Conference. Laxenburg, Austria, 27-29 June 2012. Information: <http://www.iiasa.ac.at/conference2012/>



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.

Subscribe 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